

# **Knox**

# **Environmental Weed Plan**

# **2017**



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for Knox City Council

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# Summary

Environmental weeds are plants that affect natural and semi-natural habitats by displacing indigenous flora or fauna. They represent a major cause of loss of biodiversity, nationally and locally. Knox City Council spends considerable effort and money on removing and preventing environmental weeds, through activities as diverse as park management, local laws, bushfire hazard management and overseeing developers' landscape plans. Other organisations and individuals, from Parks Victoria to private individuals, also make major commitments to controlling environmental weeds in Knox.

While environmental weeds are a significant problem, the magnitude of the problem varies greatly across Knox and between weed species. The main purpose of this plan is to make sure that efforts to control and regulate environmental weeds are well targeted.

The plan is written primarily for Council but also to assist government agencies and landowners – even someone living in a unit in suburbia and wondering whether to plant an Agapanthus or remove a Privet.

An important (but often overlooked) consideration is that, by definition, a plant cannot be an environmental weed if there is no natural or semi-natural habitat nearby for it to affect. The seriousness of an environmental weed depends not only on its own attributes but also on the proximity and characteristics of conservation values within its radius of influence. For example, an Agapanthus plant can be an environmental weed in bushland, but not in a garden bed remote from native vegetation.

This plan includes a thorough analysis of how 330 potential or known environmental weed species are harming (or threaten to harm) any of the known natural or semi-natural areas in Knox. It also analyses plant attributes such as how difficult and safe each species is to control in different circumstances, and what redeeming features a species might have, such as attractiveness. Combining all this information provides a method of allocating priorities for the control of each environmental weed species in each location across Knox.

The resulting maps provide an innovative and very practical way of targeting the control and regulation of environmental weeds.

## Mapping

Map 1 at the end of this document divides Knox into areas according to the level of ecological benefit that can be achieved by controlling environmental weeds. In 70% of Knox, only quite basic control measures, such as removal of blackberries, are warranted on environmental grounds. (There may be other considerations, such as aesthetics.) The remaining 30% of Knox is divided into three zones with different species of priority weeds. Two of these zones are further subdivided into 'core' areas where a high level of weed control can yield ecological benefits, and 'buffer' areas where a lower level is adequate. Overall, there are six zones for environmental weed management.

For the purposes of regulating environmental weeds under the General Provisions Local Law, Map 2 at the end of this document shows a simpler classification of Knox into just two zones.

The ‘high risk’ zone is recommended to be regulated quite similarly to now and in the remainder, only Blackberry would be regulated. (For details, see the Local Laws section below.)

A Geographic Information System (GIS) makes it easy to access Maps 1 and 2 interactively and display information about any location, such as the list of environmental weed species that are regulated at an address.

## Spreadsheet

An associated spreadsheet (reproduced in the Appendix) allocates high, medium or low priority to each species that acts as an environmental weed in each of the six zones of Map 1. The spreadsheet also summarises key attributes of each species, such as its seriousness, rate of spread, the difficulty of effective control, what redeeming features it may have, and the class of species to which it belongs (e.g. smothering vines or species reliant on regular soil disturbance). The spreadsheet can be readily reordered, filtered or queried to obtain many kinds of useful lists; e.g. a list of species relevant to a particular zone, ordered according to priority and/or ease of control. Such lists provide practical information about what species to target and the resources required. They will be of use inside and outside Council.

The spreadsheet includes a few species that are not known to occur within Knox currently but that are expected to arrive and present a threat. Such species are a high priority for eradication if they do arrive, because the impacts and costs rapidly escalate if the species are allowed to become established.

## Prioritising Sites and Tasks Within Sites

Some published, objective criteria have been used to compile a list of the top sites in Knox for the environmental benefits that can be gained from environmental weed control. Allocation of resources among sites also needs to take into account non-environmental criteria, but the list on p. 14 provides a very good starting point.

The best approach to take to environmental weed management within a site is strongly dependent on very localised factors and on the land manager’s objectives and resources. Chapter 6 explains some principles to apply.

## Proposed Council Actions

Most of the proposed actions for Council are underpinned by the mapping and spreadsheet. The main proposals can be summarised for each department as follows.

### *Local Laws*

It is recommended to amend the Administrative Policy Guidelines of the General Provisions Local Law so that:

- In the 46% of Knox identified as the ‘high risk’ zone on Map 2 (at the end of this document), the existing regulation would change little, with just a small number of additions and deletions from the schedule of regulated species; and
- In the remaining 54% of Knox, only Blackberry would be regulated.

This represents a major deregulation of weeds for 54% of Knox, and will reallocate compliance efforts toward infestations that have a significant environmental impact. These advantages outweigh the disadvantage of reliance on a map rather than the current blanket approach across the whole municipality.

### *Biodiversity*

The actions recommended for the Biodiversity department and its Bushland Management team can be summarised as follows:

- Provide community-friendly information that distils the basics of this environmental weed plan, e.g. through Council's website;
- Use the community-friendly information just mentioned during community engagement regarding environmental weeds, particularly with Friends groups and participants in the 'Gardens for Wildlife', 'Biodiversity Buddies' and biodiversity rate rebate programs;
- If the proposal to amend the Administrative Policy Guidelines of the General Provisions Local Law is adopted, provide information about it on Council's website;
- Hold an outdoor training session for Council's bushland staff to explain and demonstrate this environmental weed plan, the approach and principles that underpin it, the resources it provides (e.g. the associated spreadsheet) and the implications for the staff's work;
- Investigate the keenness of other departments of Council for training about the environmental weed plan, and organise training as appropriate and as resources allow;
- Seek the formation of a Landcare group in Knox, to run educational events and working bees that would include management of environmental weeds;
- Review allocation of resources among bushland reserves on the basis of the ranking of environmental priority in Chapter 5;
- Review allocation of effort to particular species of environmental weed in response to priorities indicated in the Appendix;
- Continue Council's program of prescribed burning of bushland reserves and using 'grooming' to thin out dense scrubs of Hedge Wattle (*Acacia paradoxa*), Sweet Bursaria (*Bursaria spinosa*) and/or Burgan (*Kunzea leptospermoides/ericoides*);
- Continue ecological monitoring and fire hazard monitoring of bushland so that efforts can be adjusted according to observed changes related to environmental weeds;
- With the assistance of the Active Open Space team, prepare a business case for funding the removal of 'High' and 'Medium' priority weeds (as identified in the Appendix) from road verges managed by Council;
- Seek greater liaison with Parks Victoria, Melbourne Water and neighbouring councils about weed management, particularly in connection with grants and particularly in the vicinity of the Dandenong Ranges National Park and the Lysterfield Hills;
- By 2018, extend the monitoring of bushland reserves that was done in 1999, 2002, 2007 and 2014, so that efforts can be adjusted according to observed changes related to environmental weeds.
- By 2020, conduct a review of the effectiveness of this environmental weed plan and any improvements that can be made to the methodology;

### *Park Services – Passive Open Space*

Review whether any species of ‘High’ priority in the Appendix are going untreated within the areas under management (particularly if they come under Table 4 on p. 20). If so, add the populations of those species to the weed control program, or initiate a separate process to control them and follow up;

- Check that species selected for planting are not shown in the Appendix to be environmental weeds in the relevant environmental weed zone of Map 1. Check with the Biodiversity department in case of doubt.

### *Park Services – Active Open Space*

- Strawberry Tree (*Arbutus unedo*) is listed in the Knox GreenStreets Policy as a ‘trial’ street tree species for planting in three ‘neighbourhood character precincts’. In accordance with the Appendix of this plan, Strawberry Tree should not be trialled in areas shown on Map 1 as ‘Waterways – core’ or ‘Other forests – core’, i.e. where seeds could disperse into nearby core areas of natural habitat.

### *Open Space & Landscape Design*

- Check that species selected for planting are not shown in the Appendix to be environmental weeds in the relevant environmental weed zone of Map 1. Check with the Biodiversity department in case of doubt, particularly in the case of *Correa* species;
- During weed control work in association with landscaping projects, give priority to any species that may be present from the ‘high’ and ‘medium’ priority environmental weeds in the Appendix (as applicable to the relevant zone on Map 1);
- When preparing master plans for reserves that include native vegetation, liaise with the Bushland Management team to allocate priorities for environmental weed control among the different parts of the reserve.

### *Stormwater*

- Check that species selected for planting are not shown in the ‘Waterways – core’ column of the Appendix. Check with the Biodiversity department in case of doubt.

### *Strategic Planning*

- When overlays in the ESO, VPO or SLO categories are next reviewed, take the opportunity to insert a decision guideline such as, ‘*Promoting the removal of noxious and environmental weeds and avoiding the planting of such species*’, to areas that are largely or wholly within the ‘high risk’ environmental weed zones of Map 2.

### *Statutory Planning*

- At pre-application stage of development proposals on land containing environmental weeds, express Council’s preference for the weeds to be removed. The degree of preference is to be guided by Map 1 and the Appendix. Also indicate Council’s expectation that any ‘offsets’ or compensatory landscaping or revegetation will take into account the environmental weeds indicated by the Appendix and Map 1;
- Do not approve landscape plans that propose to plant environmental weed species indicated in the relevant column of the Appendix, by reference to Map 1;

- Use the Appendix and Map 1 to aid compliance with permit conditions related to vegetation.

### *Emergency Management*

- In areas identified as having an unacceptable flood hazard, investigate whether environmental weed species can be removed to reduce the hazard;
- When seeking landowner action to reduce bushfire hazards, favour the removal of environmental weed species over other plants (and particularly indigenous species). The priority levels indicated in the Appendix can be balanced against the corresponding bushfire hazard;
- When engaging with community about emergency management, take the opportunity to promote Council's programs regarding environmental weeds and biodiversity protection;
- Assist the Bushland Management team with its program of prescribed burns.

### Organisations Outside Council

The organisations involved with environmental weed management in Knox include Melbourne Water, Parks Victoria, VicRoads, Metro Trains Melbourne, the Country Fire Authority, Ausnet Services, the Knox Environment Society and Friends groups. It is hoped that all such organisations will find the Appendix and Map 1 useful for allocating resources. The principles and methods in this document will hopefully also be helpful.

The actions that are proposed above include various interactions between Council and those organisations, as well as with neighbouring councils for cross-border issues.

The value of coordinating weed management efforts between organisations depends on the ability of the participants to contribute a substantial effort toward shared objectives. Formal links are recommended whenever opportunities arise for collaboration between adequately resourced organisations. In particular, this applies to collaboration on grants such as those under the Peri-Urban Weed Partnership program.



# 1. Introduction

Ecologists, bushland managers and governments at all levels recognise that environmental weeds represent a major cause of loss of biodiversity<sup>1,2,3,4,5</sup>. In Knox, the main ways in which environmental weeds cause harm are by:

- Out-competing indigenous plants for light, soil moisture and nutrients (e.g. by smothering);
- Preventing germination and establishment of indigenous plants;
- Making habitat less fit for native fauna and more fit for introduced fauna, including pests which further threaten indigenous species; and
- Altering the cycling of nutrients and organic matter.

These processes are interrelated.

Knox City Council spends considerable effort and money on removing and preventing environmental weeds, through activities as diverse as park management, local laws, bushfire hazard management and overseeing developers' landscape plans. Other organisations such as Parks Victoria, Melbourne Water and community groups also work to control the impacts of environmental weeds in Knox. Other bodies, such as plant nurseries, influence environmental weeds in either positive or negative ways. Some residents unwittingly or uncaringly add to the environmental weed problem through what they plant, or allow to grow, in their gardens, or through dumping garden waste in bushland or over-using fertiliser that can seep into bushland.

With such a disparate range of influences over the environmental weed problem, Knox City Council decided in 2015 to commission this document to review the situation. The objective is to provide an overall strategy that will optimise the effectiveness, efficiency and safety of activities related to environmental weeds. More detailed documentation will follow to obtain funding and take action.

However, before we can proceed any further, we need to have a clear understanding about what distinguishes an environmental weed from any other kind of weed, and how we assess their seriousness.

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<sup>1</sup> Adair R.J. and Groves R.H. (1998). *Impact of Environmental Weeds on Biodiversity – A Review and Development of a Methodology*. Environment Australia (Australian Government), Canberra.

<sup>2</sup> Scientific Advisory Committee for the *Flora and Fauna Guarantee Act 1988* (Victoria): Final recommendations for listing of the following as threatening processes: *'Invasion of native vegetation by environmental weeds'*; *'Invasion of native vegetation by Blackberry, Rubus fruticosus L. agg.'*; and *'Spread of Pittosporum undulatum in areas outside its natural distribution'*.

<sup>3</sup> Carr G.W., Yugovic J.V. and Robinson K.E. (1992) *'Environmental Weed Invasions in Victoria: Conservation and Management Implications'*. Dept of Conservation & Env't and Ecological Horticulture Pty Ltd, Melbourne.

<sup>4</sup> Victorian Government (2017). *'Protecting Victoria's Environment – Biodiversity 2037'*.

<sup>5</sup> Lorimer G.S. (2010). *'Sites of Biological Significance in Knox'*. Knox City Council, Wantirna South. 2 volumes.

## 2. What Makes an Environmental Weed?

The word ‘weed’ is just a pejorative term for a plant that is unwanted. It involves a value judgement; one person’s weed may be another person’s prized plant.

By contrast, the definition of an ‘environmental weed’ devised for this document is free of value judgements:

An environmental weed is a plant that is displacing indigenous flora or fauna. This excludes indigenous species temporarily displacing other species as part of a natural cycle.

This definition is consistent with common modern usage and is more precise than other definitions that could be found. A species is deemed ‘indigenous’ to an area if it was present there prior to European settlement.

Sometimes, a plant can be simultaneously an environmental weed and a weed by other criteria. For example, a blackberry patch may be a nuisance weed by restricting access as well as an environmental weed by outcompeting indigenous flora.

The label, ‘environmental weed’, should not be applied to a whole species but to specific plants on the basis of what they are doing at their particular location. For example, an Agapanthus plant can be an environmental weed in or near bushland, but not in a garden bed remote from native vegetation. The seriousness of an environmental weed depends on what it is threatening – e.g. very rare plants or a tiny patch of very common species – as well as how effectively it displaces indigenous flora or fauna (or is expected to do so).

While the above definition of environmental weeds is rather clear-cut, it can often be hard in practice to tell whether a plant is actually displacing indigenous plants as opposed to occupying locations that are being vacated by indigenous plants due to underlying problems. For example, one can be easily misled into thinking that Onion-grass (*Romulea rosea*) plants on the edge of bushland must be environmental weeds. In reality, the Onion-grass is filling a void left by native vegetation that can no longer grow there due to the effects of clearing, cultivation and soil compaction. That is, the introduced plant is more a symptom of environmental problems rather than a cause. The distinction is very important because a lot of misdirected and fruitless effort goes into trying to eradicate symptoms, when treating the underlying cause could resolve the problem. The optimal response to environmental weeds requires expertise and objectivity in assessing how plants are altering or responding to their environment.

Another important point is that indigenous plants can sometimes become environmental weeds. This occurs when human activity has upset ecological balances and allowed a species like Burgan (*Kunzea leptospermoides*) to become unnaturally rampant within its natural range, displacing other indigenous species.

Human-induced climate change raises a philosophical conundrum. As climate change causes plant species to shift out of their natural ranges into new areas, pre-existing indigenous plants in the new areas are sometimes out-competed by the immigrants. The immigrants fit the definition of environmental weeds, but should we welcome the process as part of nature adapting to climate change? There is no simple answer and the question has rarely been considered.

An environmental weed can sometimes have redeeming features. For example, Sweet Pittosporums (*Pittosporum undulatum*) can be very serious environmental weeds but they have

fragrant flowers, glossy green crowns, and in some locations, they contribute to the green and leafy image that is so highly prized in Knox. On the other hand, a plant may be only a low-level environmental weed but quite serious for some other undesirable attribute, such as toxicity or obstructing floodwater. Consideration of an environmental weed therefore should take a broad view of the plant's attributes, positive and negative.

### 3. Methodology for Assessing Species Priorities

From place to place and species to species, the level of impact of environmental weeds varies from very serious to rather innocuous. There will never be enough funding and resources to eradicate all environmental weeds, so it is critical to allocate priorities to the most important weeds.

This chapter explains how those priorities have been decided in this plan. If the methods do not interest you much, turn to Chapter 4.

The decision about whether the planting of a particular species at a particular site is environmentally acceptable only needs to consider whether any material environmental harm could be done. Assessment of the level of harm to be expected is the subject of Section 3.3. If the species is found to pose an environmental risk, a more suitable species can almost always be chosen.

For environmental weeds that already exist, priorities for their control should take into account:

- The environmental context of where the weeds are growing, e.g. on a waterway or in a highly urbanised area (Section 3.1);
- The capacity of each species to expand into natural areas that it does not yet occupy (Section 3.2);
- The level of environmental harm that is being done currently or in prospect (Section 3.3);
- The difficulty, effectiveness, safety and environmental hazards of the available methods for removing the environmental weeds *and* have them replaced with something better (Section 3.4);
- The *pros* and *cons* of the plants' non-environmental attributes, such as the attractiveness and utility of Agapanthus or the toxicity of Hemlock;
- Legal obligations to control the plants under a local law or the state *Catchment and Land Protection Act 1994*.

After taking all these factors into account, a priority level can be allocated to an environmental weed species at any particular location. For this environmental weed plan, priorities have been categorised as 'High', 'Medium' and 'Low', as described in Chapter 4. This leads to Map 1 at the end of this document, which maps priorities for environmental weed control across Knox.

#### 3.1. Environmental Context

As discussed in Chapter 2, priorities for environmental weed management should be decided not just on the basis of the species (as normally done in weed plans) but also according to the environmental context of each location.

The botanical survey data and mapping that exist for Knox show that natural vegetation communities and environmental weed species are clearly different between the following parts of the municipality:

1. 'Low risk' areas, far enough from any natural or semi-natural areas that environmental weeds cause low concern;
2. Waterways – wetlands, streams and floodplains;
3. The area of tall forest and high rainfall in The Basin and Sassafras; and

#### 4. Other forests (or remnants of them).

It has also been found useful to split each of categories 2 and 4 into two as follows:

- a. 'Core' areas with moderate or high conservation values and a range of indigenous plant species that can regenerate when environmental weeds are excluded. These factors make it worthwhile to apply intensive weed control, even in the ground flora. 'Core' areas are also taken to include narrow strips of abutting vegetation in which it is important to exclude sprawling weeds such as *Oxalis* species, Wandering Trad and Angled Onion; and
- b. 'Buffer' areas that have low (or no) conservation value but where environmental weeds can cause deterioration of fauna habitat or disperse into core areas. In these areas, basic control of environmental weeds (e.g. woody weeds and blackberry) yields worthwhile environmental benefits but intensive weed control is more demanding than in 'core' areas and yields less environmental benefit.

Therefore, priorities for environmental weed management have been separately determined for a total of six different environmental contexts, henceforth called 'zones'. These appear on Map 1 at the end of this document. Finer categorisations were found to provide inadequate benefit for their added complexity.

Map 1 is also available for Geographic Information Systems (GIS), which allow the map to be interactively investigated and display information about any location, such as a priority-ranked list of environmental weed species at any chosen address.

Mapping of the zones has been done in an iterative process. It began with a draft map (initially with finer classifications) based on the 'Sites of Biological Significance' study of Lorimer (2010), with updating from recent satellite photography and site inspections as required. Core areas were initially taken to be the known areas of moderate or high conservation value, then enlarged slightly into abutting land wherever there is a potential source of sprawling weeds such as *Oxalis* species. Around each of these core areas, a 'buffer' area was mapped to a distance that took into account the sensitivity of the core and the dispersal distance of the environmental weed species likely to be found in the buffer. A buffer in pasture or urban residential areas typically extends 100 m from a core area. Industrial areas and large shopping centres with negligible vegetation do not need to be included in any buffer.

Areas of semi-natural vegetation that have few indigenous plant species and low conservation value were mapped as 'buffer' areas, along with surrounding land to a radius that takes into account the site's environmental sensitivity and the surrounding prevalence of environmental weeds.

With the exception of some large properties, the zone boundaries have been drawn so that private properties fall wholly within one or another zone. This should make it easier for each landowner to use the Appendix to learn about the environmental weed species that may affect their property.

### 3.2. Capacity to Spread

The rate at which a species can spread from its current distribution into natural areas affects the urgency with which it should be controlled and the level of harm it will do if left uncontrolled. Even a species that has just arrived in Knox as a tiny infestation on a weedy roadside may be a high priority for control if it threatens to expand rapidly into natural areas, creating rapidly

increasing environmental harm and control costs. This is a realistic scenario for Chilean Needle-grass (*Nassella neesiana*), which is therefore given a high priority for control and regulation.

It is useful to think in terms of the ‘radius of influence’ of a weed. An example of a species with a large radius of influence would be Pampas Grass (*Cortaderia selloana*). It produces copious, wind-blown seeds capable of germinating in substantial numbers at distances of over 1 km, if suitable habitat is present. Kikuyu (*Cenchrus clandestinus*) is an example of a species with a small radius of influence. It produces no seeds and, in the absence of human assistance, it can only spread by lengthening its runners, which is slow and ceases altogether when the runners reach a footpath, road or similar barrier.

These sorts of differences in dispersal are very important when assessing the priority for controlling a weed in a particular situation. Take the example of residences separated by a road from significant bushland that is vulnerable to both Pampas Grass and Kikuyu. Pampas Grass at the residences poses a substantial threat to the bushland whereas Kikuyu poses no threat unless someone transports runners across the road. (Dumping of garden waste into bushland is a significant problem in Knox.)

The research for this environmental weed plan found no useful data or scale of measurement for a weed’s radius of influence.

The radius of influence of a species is characterised in this plan by thinking ten years ahead about where the descendants of today’s plants will be well established in natural or semi-natural areas. The radius of influence is estimated as the maximum distance those descendants may be from any current-day members of the same species, in the absence of any new control measures.

Note that for some species, there may be many generations over ten years. The shorter the generation time, the greater the radius of influence, all other things being equal. The ten-year time frame that has been chosen is long enough to take that into account, and also to smooth out fluctuations that occur from year to year.

Note also that a species which already occupies practically all of the parts of the landscape that suit it will generally have a very small radius of influence because descendants will not establish far from the current generation. There may be exceptions if climate change or other changes create new opportunities.

In practice, the radius of influence indicates a safe distance between a natural or semi-natural area and an environmental weed.

(Incidentally, the concept can also be applied to the dispersal of other organisms, including indigenous flora or fauna, or even diseases.)

The radius of influence of a species can vary from place to place because:

- Establishment in new areas requires suitable unoccupied ecological niches to be available, and those niches are not present everywhere;
- Humans may aid or inhibit dispersal in some areas more than others; e.g. slashers can spread Chilean Needle-grass seeds readily around a highway network and through pasture, while normal gardening practices normally stop oat plants from spreading through urban residential areas; and
- Some parts of the landscape may be intrinsically more amenable to dispersal than others; e.g. water-borne seeds move more freely across floodplains than on dry land.

The author has been able to estimate radius of influence from his observations combined with species distribution data, topographic information, site inspections and information about modes of dispersal (e.g. species whose seeds are dispersed by ants do not spread far). The estimates are imprecise but they are adequate for this plan and the uncertainties are much less than the large differences between species. The estimates (as categories) for 330 species appear in the Appendix and in the spreadsheet that accompanies this plan.

On a property-by-property basis, the author has compared his estimates of radius of influence with the distance to nearby natural or semi-natural areas. If a property is deemed unlikely to have any significant environmental weed species whose radius of influence extends into sensitive natural or semi-natural vegetation, it has been mapped as 'Low risk'.

### 3.3. Level of Harm Done

As discussed in Chapter 2, assessing the level of harm that a particular environmental weed species is causing at a particular location must take into account:

- The importance of the habitat being affected or threatened, e.g. the home of a rare plant or animal;
- The capacity of the weed species in question to replace indigenous flora and/or to affect fauna, either currently or in future, anywhere within its radius of influence; and
- To what degree the weeds at a site are *causing* ecological problems, rather than being symptoms of underlying problems that should be addressed instead.

The first of these factors – the importance of the affected habitat – is unusually well studied and documented in Knox, particularly through the *Sites of Biological Significance* study and management plans for most bushland reserves, roadsides and waterways. All of the associated field data, maps and documents have been used in this environmental weed plan. They have been updated and augmented by new site inspections, interpretation of recent satellite photographs and virtual site inspections using 'Google Street View' photography.

For this document, the tendency of each environmental weed species to occur in each type of habitat, and in what densities, has been determined from the copious botanical records across Knox and surrounding areas. The foliage densities provide a good indication of the species' competitiveness for the primary resources of sunlight, soil moisture and nutrients. The stature of a species is important in affecting the amount of sunlight that reaches it and how many lower plants will be shaded by it. Botanical data also shows the tendency of an environmental weed species to occur in the most natural areas, which is another indicator of the species' potential to cause environmental harm. For some species, there are additional considerations such as allelopathy (exudation of chemicals into the soil to suppress growth of competitors) or the tendency of many willows to alter stream flows and stream cross-sections.

However, the tendency of a species to occur densely in a particular environmental context is not always a good indication of the environmental harm it causes, because some species are *symptoms* of environmental problems rather than *causes*. For example, there is a suite of small species that often occur fairly densely beside paths through bushland but rarely grow more than a few metres from the paths. Despite their density and their occurrence beside paths in near-pristine habitats, they are best regarded as symptoms of the regular disturbance of vegetation beside paths by humans and animals.

By monitoring vegetation over decades, the present author has observed that populations of many environmental weed species, like those just described, hardly change and remain fairly confined to particular conditions of environmental modification. This indicates that the species can be regarded as symptoms of those modifications rather than as agents of environmental degradation.

An important example is Panic Veldt-grass (*Ehrharta erecta*), which is often loathed by people who love forests free of introduced species. Because it grows densely and is usually accompanied by very few small indigenous species, it is usually seen to represent environmental degradation. This may be reinforced by the observation that the species can occur in forest that is otherwise quite natural. However, on closer inspection, the species' distribution tends to remain fixed over the years, and it rarely occurs other than in two circumstances: (a) where the environment has been so modified from a natural state that it is unfit for most indigenous plants; and (b) beneath indigenous Cherry Ballart trees (*Exocarpos cupressiformis*), which actively suppress the growth of indigenous plants and may be surrounded by near-pristine forest. Consequently, most attempts at removing Panic Veldt-grass are futile because the underlying conditions remain ideal for that species and not for indigenous plants. Ironically, the persistence of the species is often taken as evidence of how serious the species is, rather than of it being just a symptom of underlying conditions. At its worst, Panic Veldt-grass is a component of a syndrome that inhibits environmental improvement, not an agent of active degradation.

As is the case for the rates of spread discussed in Section 3.2, there has been very little research anywhere on the degree to which an environmental weed is a *cause* of environmental problems rather than a symptom, even for a single species in particular circumstances. Indeed, the question is rarely even considered. There is certainly far too little research of these kinds to support assessments of all environmental weed species across the whole of Knox. With this in mind, the example of Panic Veldt-grass illustrates the importance of acquiring knowledge from close ecological scrutiny and long-term monitoring of vegetation.

The author of this plan has acquired that kind of knowledge during thirty-five years of botanical work and environmental weed control in Melbourne's eastern fringe, including twenty years of regular botanical surveys and vegetation monitoring in Knox. He has also consulted others as part of the preparation of this environmental weed plan. Among those people are Council staff who have a wealth of practical experience that will be very valuable for implementing this environmental weed plan.

For each species that is (or may become) an environmental weed in Knox, the level of harm has been assessed within each of the six zones of environmental context described in Section 3.1. Ratings have been allocated as follows:

- ‘**Alert**’: Becoming denser and/or more widespread so rapidly that the species is expected to cause a substantial reduction in indigenous flora or fauna within the next few years unless new control measures are introduced. This excludes species that have already done such damage but are no longer actively and very seriously displacing the remaining indigenous flora and fauna;
- ‘**Serious**’: Either (a) Not worsening as fast as the above (or at all), but still causing substantial displacement of indigenous flora or fauna, either actively or by suppressing ecological recovery; or else (b) Likely to fall into the ‘Alert’ category within ten years if preventative action is not taken;

**‘Moderate’**: Not as serious as above, but still causing (or likely to cause in future) adverse environmental effects, either by causing active deterioration or preventing ecological recovery;

**‘Minor’**: Presenting only a minor ecological threat, e.g. weeds that are expected not to spread beyond the edges of paths and tracks; and

**‘Presumed innocuous’**: Not known to reproduce within the area under consideration, though occasional plants may appear sporadically and have very little impact.

These categories align with the scale of weed severity used in the ‘Sites of Biological Significance’ study of Lorimer (2010) except that the former ‘Insignificant’ category has been split into two and the ‘Very serious’ category has been renamed ‘Alert’ to highlight that rapid expansion is its distinguishing feature. The categories are also closely aligned to those of Carr *et al.* (1992).

Sometimes environmental weeds have compensating benefits, e.g. erosion control. Such benefits are considered below rather than in the rating scheme above. They also need to be taken into account when planning weed control.

### 3.4. *Difficulty, Effectiveness and Safety of Control*

The priority given to the control of a particular environmental weed should take into account how safely, easily and effectively the weed may be controlled. A weed that is easily and safely eradicated may be given a high priority even if it causes only moderate harm, while a more serious weed may be given low priority because there is no safe and effective way to control it.

#### 3.4.1. Effectiveness

An important aspect of the effectiveness of environmental weed control is what happens after the weeds are killed. Weed control cannot be deemed effective if it simply results in recovery of the weed or substitution by other species that may cause a similar level of harm. What matters is the long-term benefit that arises from the control effort.

To illustrate, Panic Veldt-grass is often targeted in Victorian conservation reserves but very rarely with lasting effect, despite competent and sustained efforts. Usually, control of Panic Veldt-grass requires an unacceptable cost and effort to be effective, so it generally deserves low priority for control even when it causes moderate environmental harm (at its worst). However, the priority can rise to moderate in domestic situations such as ‘Gardens for Wildlife’ when the gardener is prepared to expend the effort required to remove the weed *and* foster its replacement by more desirable species.

Wetlands deserve particular mention at this point because of their distinctive ecology and its implications for achieving effective control of environmental weeds. There is hardly any overlap between the weeds of wetlands and the weeds of anywhere else. A key feature of wetlands is that they are naturally very dynamic in response to fluctuations in water level. As water levels rise and fall, plants die as conditions become too dry or too deep for their survival, leaving bare ground. When the water returns to a level conducive to good plant growth, most plant species that occur in wetlands are extremely good at recolonising the bare, fertile ground. The mass colonisation that occurs involves great competition among species, so evolution has favoured species (indigenous and introduced) that are very competitive against the vigorous

growth of other species. Consequently, in wetlands, indigenous plant species tend to compete well against introduced species, unlike vegetation on dry land.

It follows that we need to accept that wetlands in Knox will be continually recolonised by introduced species, and console ourselves that most indigenous wetland species are adapted to cope. (There are exceptions, such as Austral Ladies Tresses, *Spiranthes australis*, which are more sensitive.) Effective control of environmental weeds in wetlands does not mean lasting replacement of the weeds by indigenous plants, but rather, a shift in the dynamics to favour indigenous flora and fauna.

Whether in wetlands or elsewhere, some groups of weed species tend to occur together and can be conveniently controlled as a group, without the need for different techniques or timing. Other species have to be targeted individually, which makes them less efficient to control. This has been taken into account in rating each weed species for its ease of control.

### 3.4.2. Safety

Human and environmental hazards should be taken into account whenever the control or regulation of any weed is contemplated.

Weed control involves the usual safety hazards of working in vegetation (e.g. bull-ant stings) and a few species are hazardous to handle; e.g. Hemlock (*Conium maculatum*) is poisonous. Some species require herbicides for effective control and others do not, and some of the chemicals required are more hazardous than others.

While weed control can involve safety hazards to the person doing the work or to others, there are often countervailing hazards if the weeds are left untreated. For example, if Hemlock is left, it can pose a hazard of poisoning unsuspecting people, particularly small children. Some environmental weeds pose a bushfire hazard and should be given additional priority for that reason.

Recent community concerns about the hazards of using the most commonly used herbicide – glyphosate – deserve particular mention. The main basis for the concerns is that in 2015, the World Health Organisation’s (WHO) International Agency for Research on Cancer classified glyphosate as probably carcinogenic to humans (category 2A). That puts it in the same category as eating red meat, and safer than eating processed meat, which is categorised as ‘carcinogenic to humans’ without qualification.

The US Environmental Protection Agency does not regard glyphosate as a human carcinogen. The view of the Australian Pesticides and Veterinary Medicines Authority ‘is that products containing glyphosate are safe to use as per the label instructions’.

The WHO’s 2015 placement of glyphosate in category 2A identified a potential to cause cancer but not how great the likelihood is. Some other chemicals in daily life have a potential to cause cancer but the risk is too low to be concerned about. In May 2016, the WHO convened a review of the likelihood that glyphosate would cause cancer in humans. The review concluded that ‘glyphosate is unlikely to pose a carcinogenic risk to humans from exposure through the diet’<sup>6</sup>.

For these reasons, this environmental weed plan does not anticipate that glyphosate usage will have to be curtailed.

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<sup>6</sup> Summary report of the Joint FAO/WHO Meeting on Pesticide Residues, Geneva, 9–13 May 2016.

### 3.4.3. Environmental Hazards

Probably the greatest environmental risk involved with environmental weed control is inadvertent killing of non-target species, either incidentally or due to mistaken identity. A good rule is, ‘When in doubt, don’t pull it out!’ (or substitute ‘spray’ for ‘pull’). There are many cases where the harm done to a rare species by one momentary mistake has cancelled out the benefits of years of good weed control.

Control of environmental weeds in wetlands and along streams carries the additional hazard that such environments (and particularly frogs) can be particularly sensitive to herbicides. In the case of Wandering Trad (*Tradescantia fluminensis*), there is also a hazard of dislodging living fragments that can be washed downstream and take route in a previously unaffected site.

Another environmental hazard that sometimes accompanies weed control is inadvertent removal of wildlife habitat. A typical example is the removal of blackberries being used by wrens or Golden-headed Cisticolas as habitat in the absence of any remaining indigenous undergrowth. That is not to say that one should not remove the blackberries, which probably also harbour foxes that kill wildlife. Rather, the removal should be preceded by the creation of substitute habitat, e.g. by planting some desirable prickly shrubs.

Similarly, if environmental weeds are providing other benefits such as erosion control – or even attractiveness – their removal should not be avoided but instead complemented by actions to compensate for the loss of the weeds. These corrective measures need to be factored into the difficulty and cost of controlling environmental weeds.

### 3.4.4. Overall Tractability

All of the preceding factors concerning the difficulty, effectiveness, safety and environmental hazards of weed management have been taken into account in the priorities that this environmental weed plan gives to control of different species.

The Appendix includes a column labelled ‘tractability’ that weighs up all the factors applicable to the management of each species. The following categories of tractability are used:

- a) Easy;
- b) Standard techniques, normal follow-up;
- c) Difficult, perhaps lots of follow-up;
- d) Usually intractable;
- e) Dependent on underlying conditions being changed; and
- f) Uncertain (in very few cases).

There is also a column headed ‘Special features’ that includes unusual factors that apply to particular species; e.g. the toxicity of Hemlock and the risk of mistaking the indigenous *Acacia melanoxylon* for the weedy *Acacia longifolia*.

## 4. Priority Ratings of Species

As explained in Section 3.1, Knox has been divided into six zones of different environmental conditions relevant to environmental weeds, as follows:

1. 'Low risk' areas of farmland or suburbia, far enough from any natural or semi-natural areas for environmental weeds to cause low concern;
2. Waterways – wetlands, streams and floodplains:
  - a. Core areas of moderate to high conservation value, warranting intensive environmental weed control;
  - b. Buffer areas of lower conservation value, where basic control of environmental weeds (e.g. woody weeds and blackberry) yields worthwhile environmental benefits but intensive weed control is more demanding than in 'core' areas and yields less environmental benefit;
3. The area of tall forest and high rainfall in The Basin and Sassafras; and
4. Other forests (or remnants of them):
  - a. Core areas defined as for 2a;
  - b. Buffer areas defined as for 2b;

These zones appear on Map 1 at the end of this document.

For each zone, a priority level (high, medium or low) for control has been allocated to every species of environmental weed that is believed to be relevant to the zone. There are 330 species in total. The priority ratings appear in the Appendix and also in the spreadsheet that accompanies this document.

The priorities take into account all the matters discussed in Sections 3.1 to 3.4 as well as:

- The *pros* and *cons* of the plants' non-environmental attributes, such as the attractiveness and utility of Agapanthus or the toxicity of Hemlock;
- Legal obligations to control the plants under a local law or the state *Catchment and Land Protection Act 1994*.

The listed priorities refer to typical situations within each zone and there are sometimes reasons to adjust them for atypical situations. For example, the low priority that the Appendix gives to Panic Veldt-grass in three zones could be raised to moderate for a 'Garden for Wildlife' in those zones if the gardener is prepared to conduct the frequent, fastidious follow-up that is required for success.

Any prioritisation of environmental weeds must involve a level of professional judgement. In this case, the judgement is principally that of the author, based on experience and detailed environmental information about Knox. It is recommended that the allocated priorities and the underpinning methodology be exposed to independent review.

## 5. Top Priority Locations

Chapters 2-4 provide guidance about which environmental weed species are of most concern within each zone, but they do not provide much guidance about which sites deserve greatest attention. The latter requires consideration of the sites' conservation significance and the degree to which environmental weeds are affecting their significance (or more precisely, the degree to which we can reduce those effects). This chapter takes those matters into account to determine the sites in Knox where control of environmental weeds offers the greatest environmental benefits. The greatest use of the information is expected to be for Knox City Council to allocate its priorities for weed control.

Downey *et al.* (2010) devised the 'triage matrix' in Table 1 that can help allocate resources among different sites, e.g. among Knox City Council's bushland reserves. Firstly, we consider the conservation values present at each site, which are documented in the 'Sites of Biological Significance in Knox' study of Lorimer (2010), updated as required. Next, we consider the degree to which each site's conservation values would be affected or threatened by environmental weeds if left uncontrolled. These two factors lead us to what is described as 'Level of threat to biodiversity' on the two columns at the left of Table 1; for example, a highly significant bushland reserve with naturally low weed problems may rate 'Medium', just as for a reserve of modest conservation value facing major decline from environmental weeds. We now consider how well weed control can effectively, safely and easily reduce the impacts on conservation values. This leads us to one of the columns with 'High', 'Medium' and 'Low' at the top of Table 1, and hence to one of the cells in the table. For example, a site that falls in the 'Medium' row of the table and where there is a 'High' potential to reduce the impacts on conservation values, directs us to the cell containing 'D - Targeted management action needs to occur promptly and long-term'.

**Table 1. Triage matrix for prioritising sites for environmental weed control.  
From Downey *et al.* (2010).**

		Probability of protecting biodiversity at specific sites [i.e. potential to reduce the impacts on conservation values]		
		High	Medium	Low
Level of threat to biodiversity [impact if weeds not controlled]	High	A - Weed management is critical, immediate, targeted and long-term	B - Targeted management action needs to occur promptly and long-term	C - Broad management (i.e. of multiple threats simultaneously)
	Medium	D - Targeted management action needs to occur promptly and long-term	E - General management to reduce the impact of weed populations	F - General low level management to reduce the threat
	Low	G - Actions to minimise the threat and prevent further elevation of the problem	H - Low level of management only	I - No immediate action, management action required only after completion of higher priorities

Professional judgement is involved in any scheme like this to allocate priorities for environmental weed control among different sites. It requires knowledge about the effects and

behaviour of environmental weeds as well as the significance and vulnerability of the conservation values affected by the weeds. The author has applied his knowledge of Knox's conservation areas and applied the triage matrix to compile Table 2 for the highest priority sites for environmental weed control in Knox. However, those priorities need to be tempered by considerations other than conservation values such as:

- Equity for people in all suburbs to have good, local opportunities to connect with nature;
- Visitation levels to each reserve; and
- Imperatives, opportunities and sources of funding that apply to specific sites, e.g. under Council's 'offset' program to compensate for clearing of vegetation elsewhere.

Therefore, the priorities in Table 2 should be interpreted only as *environmental* priorities that can be adjusted when other factors are taken into account.

**Table 2. Top priority sites for environmental weed control in Knox.**

All the sites are rating 'A' according to the matrix in Table 1. They are described in the 'Sites of Biological Significance in Knox' report of Lorimer (2010).

Those preceded by asterisks are under Council's management.

Dandenong Ranges National Park and adjacent land, Sassafras & The Basin  
(Simpsons Rd to Bayview Cres)

Rowville Electricity Terminal Station

Liverpool Rd Retarding Basin and Sugarloaf Hill, Boronia

\* Bateman Street Bush, Wantirna

\* Heany Park, Rowville and properties to its south

\* Lakewood Nature Reserve, Knoxfield

\* Wicks Reserve & Wicks East Nature Reserve, The Basin

\* W.G. Morris Reserve, Wantirna

\* Flamingo Reserve, Wantirna South

\* Coppelia Street Bushland, Wantirna South

\* Blamey Reserve, Boronia

\* Koolunga Native Reserve, Ferntree Gully

Winton Wetlands Reserve, Wantirna

Interestingly, stream corridors are not well represented among the top priority sites, even though they have high conservation significance for wildlife movement and their significance is highly affected by environmental weeds. Unfortunately, lasting control of riparian weeds is notoriously difficult in a landscape like Knox, principally because the flow of water transports weed seeds and nutrients, and weed establishment is greatly aided by the fertile, moist conditions and the exposed soil following floods.

## 6. Weed Control Principles for Each Site or Property

Chapters 2–3 discuss environmental weeds as a general issue, then Chapter 4 puts the focus on individual species and Chapter 5 considers individual sites. This chapter looks at what approach should be taken within a site, whether it be a property, reserve, patch of bushland or segment of a bushland corridor. The intent is not to provide a weed control manual but rather to cover principles that are helpful, with a focus on principles that are often overlooked or that apply specifically to environmental weeds as opposed to general weeds.

Map 1 at the end of this document allows us to determine the environmental weed zone applicable to any site. The Appendix or associated spreadsheet then provides a guide to the priorities for control of each environmental weed species within that zone. Depending on the resources available and the owner's objectives for the site, weed management may target species at all priority levels or perhaps just the high priority species. Failure to control even the high priority species would usually represent bad land management and an imposition on nearby landowners and the local environment.

A site may be atypical for its zone, particularly if it is close to the border with another zone or has a very high density of environmental weeds. If required, site-specific refinements can be made by considering each species against the criteria in Chapters 2-4.

### 6.1. Areas Near Native Vegetation

For an area without any native vegetation or aquatic habitat, the primary environmental weed issue is whether any existing plant, or any species that may be considered for planting, could cause environmental harm by sending its offspring or runners into nearby natural or semi-natural habitat. Whether a plant can reach that far can be gauged from the 'Radius of Influence' values in the Appendix, species by species. There may also be barriers that inhibit dispersal, such as expanses of hard paving.

If a species is under consideration for planting and is found to pose an environmental risk, a more suitable species can almost always be chosen.

If any existing plants are found to pose a risk to nearby habitat, their removal can be prioritised as per the Appendix. If there are enough plants to remove, priorities might be adjusted across the area according to where the weeds are most abundant or closest to significant habitat relative to their radius of influence. Techniques for removal are not described in this document, but note the safety and environmental hazards discussed in Section 3.4.

### 6.2. Patches of Native Vegetation

Inside a patch of native vegetation, priorities for environmental weed management can again be initially guided by the Appendix and then adjusted or refined from place to place within the patch. The spatial variability can respond to varying weed density and, most importantly, to the conservation values being affected. Both of those things tend to be quite variable within a patch of bushland in Knox (wetlands less so). For example, the fringes of bushland tend to have more environmental weeds, fewer indigenous flora and fauna species and lower incidence of rare species than internal areas. Deeper within a patch, environmental weeds and conservation values are often patchy due to what has been done to the land in the past.

The triage matrix of Table 1 can provide guidance for how to approach different sections of a patch of bushland. Top priority goes to areas and weed species that promise the greatest conservation benefit (perhaps combined with other benefits like fire safety) for the amount of effort required. For example, Sweet Pittosporum (*Pittosporum undulatum*) often causes major detriment to near-pristine vegetation in Knox and it is relatively quick, easy and safe to eradicate, resulting in very high priority for action. (However, aesthetic considerations sometimes dictate staged removal, beginning with the females.)

When planning weed control activities, it is important to remember the safety and environmental hazards discussed in Section 3.4. During the actual control work, it is important to minimise collateral damage and remember, ‘When in doubt, don’t pull it out!’ (...or spray it out).

Another aspect of environmental weed management of bushland areas is consideration of whether immigration of weeds from nearby land is important enough to warrant seeking cooperation from neighbours. This requires an inspection of the neighbourhood in search of weeds that lie within each species’ radius of influence from the bushland (as per the Appendix). If a significant source of weed immigration is found, it is hoped that the information in this document will help the process of seeking the landowner’s cooperation.

## 7. Council Activities

This chapter begins with a section that identifies Council activities and functions that relate to environmental weeds. It then gives the proposed actions for each department of Council.

### 7.1. Review of Current Council Activities

The preparation of this document included a review of all the activities and functions of Knox City Council that can have an impact on environmental weeds, positively or negatively. Key staff within each potentially relevant unit within Council were interviewed and/or participated in a workshop. An assessment was made of which activities were relevant, how much impact they have and what might be done to achieve better results. The proposed actions in this chapter and the information in the chapters above have been produced in response to the interviews and the workshop.

Table 3 lists all the activities and functions that were found to relate to environmental weeds, each rated according to their importance in the overall effort to minimise the adverse effects of the weeds. The importance rating of each action takes into account the seriousness of the weeds involved and, most importantly, the conservation value of the vegetation or aquatic habitat that is affected. An action may have high importance in management of particular sites but the ratings in the table are taken relative to the overall impact across Knox. For example, the biodiversity rate rebate scheme has very positive benefits on the affected properties but there are too few properties involved to have a Knox-wide impact above ‘moderate’.

**Table 3. Council actions and functions that affect environmental weeds.**

Section of Council	Activity	Importance to Env'tl Weed Mgmt
Bushland Management team	Weed removal in bushland and wetlands	Critical
	Revegetation of formerly weedy areas	Moderate (locally high)
	Organising prescribed burns	Moderate
	Strategic slashing & brushcutting	Moderate
	Thinning of scrub	Moderate
	Support and guidance of ‘Friends’ groups	High
Biodiversity department, other than the bushland management team	‘Gardens for Wildlife’ program	Moderate (locally high)
	‘Biodiversity Buddies’ grant program	Moderate (locally high)
	Biodiversity rebate for council rates	Moderate (locally high)
	Provide advice to other Council departments regarding suitability of species to be planted	Moderate (locally high)

Section of Council	Activity	Importance to Env'tl Weed Mgmt
	Partnership with the Knox Environment Society	Moderate
	Other community outreach, e.g. publications and nature events	High
	Weed advice to other Council departments	Moderate
Park Services – Passive Open Space	Weed control in native vegetation outside council's conservation reserves	High
	Slashing	Moderate
	Planting and associated work	Moderate
Park Services – Active Open Space (which also manages street trees)	Replacement of weedy wild trees from roadsides in priority areas	Moderate
	Street tree planting by approved species list	Neutral
Open Space & Landscape Design	Selection of plant species to be planted	Moderate
	Landscape design – providing buffers between amenity plantings and bushland	Minor (locally moderate)
	Arrange weed control for landscaping projects	Moderate
	Using Master Plans to designate parts of reserves where weed control is a priority	Minor
	Introducing or moving soil for landscaping	variable
Stormwater	Planting and selection of plant species	Moderate
	Purification of surface water	Moderate
	Reducing pulsing of inflows to waterways and floodplains	Moderate
	Weed removal prior to capital works	variable
	Encourage the community to reduce discharges of nutrients and other pollutants from their land	Minor
Strategic Planning	Recognition of environmental weeds in the Municipal Strategic Statement	Minor
	Using planning overlays to influence planting and weed control when permits are sought	Moderate
	Exempt certain environmental weed species that are native to Victoria from protection under clause 52.17 of the planning scheme	Moderate
Statutory Planning	Advising landowners about planning provisions concerning environmental weeds	Moderate
	Approval of landscape plans and 'offset' plans	Moderate
	Enforcement of conditions on planning permits regarding landscaping & offsets	Moderate (locally high)

Section of Council	Activity	Importance to Env'tl Weed Mgmt
Local Laws	Implementation of weed provisions in the Administrative Guidelines for the 'General Provisions Local Law'	Minor (with potential to be moderate)
	Enforcement of state law regarding declared noxious weeds	Minor
Emergency Management	Serving notices on landowners for fire hazard reduction work	Moderate
	Organising prescribed burns	Moderate
Sustainable Futures	Community outreach, e.g. 'Gardens for Harvest'	Minor
	Secretariat for the Environment Advisory Committee	Minor

Not all the activities in Table 3 have unequivocally positive impacts on environmental weeds. For example, prescribed burns can be very beneficial sometimes and create weed problems at other times, depending on what species of weeds are present and the timing and intensity of the fire. Even a fire that stimulates mass germination of weed seeds (e.g. Gorse) can provide a great opportunity to eradicate the new generation before it produces seeds for the next generation.

Therefore, rather than Table 3 being a league table of the most successful activities regarding environmental weeds, it shows which activities are most important to get right. The importance ratings also take into account potential for each activity to be made more effective.

A concerted effort was made to consider whether there are any new, beneficial activities that Council could introduce. The only activity that might come into that category is applying for grants, which is discussed in Section 7.4.

One particular innovation that the staff workshop identified as offering benefits across many departments was to document which parts of Knox are sensitive to environmental weeds and which species are of concern. That led directly to the creation of the Appendix and maps at the end of this document, and the methodology described in the Chapter 3.

The following sections provide the actions that are proposed for Council to take, department by department.

## 7.2. Local Laws

Environmental weeds in Knox are regulated principally under the General Provisions Local Law, which was last updated in 2015. The schedule of species covered by the local law appears in the associated Administrative Policy Guidelines.

The local law is a critical measure for minimising the impacts of environmental weeds in Knox, mainly because most people observe it but also because it allows enforcement. The state law over noxious weeds is only effectively enforceable on large, rural properties.

The local law can be made less intrusive and more effective, and compliance activities can be made more efficient, by regulating environmental weed species only in the parts of Knox where they genuinely make a difference. This can now be done because the Appendix and Map 1 provide information to decide which species to regulate and where they should be regulated.

An analysis of the information in the Appendix leads to only minor recommended changes to the species covered by the local law (see below). However, it is recommended to apply the schedule selectively according to location, no longer uniformly throughout Knox.

Map 1 is too complicated for regulatory use. Instead, Map 2 reduces the number of zones down to two and the boundaries have been ‘rounded off’ so that they can be easily interpreted on a simple map of Knox. If the boundaries of the ‘high risk’ zone on Map 2 are deemed too complicated, they can be simplified further to match easily recognisable roads on a map.

It is proposed to replace the existing schedule of regulated species with Table 4 and to reference Map 2. In the 46% of Knox that forms the ‘high risk’ zone, the full list of species in Table 4 would be regulated. In the remaining 54% of Knox, Blackberry would be the only regulated weed species.

Compared with the current schedule of regulated species, Table 4 adds ten new species and deletes five.

Cotoneasters (genus *Cotoneaster*), Willow-leaf Hakea (*Hakea salicifolia*) and Monterey Pine (*Pinus radiata*) are proposed to be removed from regulation because they are so much part of the landscape that it is unrealistic to demand that they be all removed, despite their weedy tendencies. St Peter’s Wort (*Hypericum tetrapterum*) is proposed to be deregulated (as the state government has done) because it has proved quite intractable and attempts at controlling it have produced net negative environmental outcomes. Blue Periwinkle (*Vinca major*) is proposed to be deregulated because most occurrences outside bushland pose negligible environmental risk and control is so difficult that it usually requires herbicides that are not recommended for untrained users.

Of the ten species in Table 4 that are not already regulated in Knox, seven are extremely uncommon in gardens and are rare elsewhere in Knox. Regulating them will therefore affect very few people. They are included because controlling them before they become abundant is the best way to minimise the cost, effort and environmental damage that could be caused. The new species that are more common are Pampas Grass (*Cortaderia selloana*), non-weeping willows (in the genus *Salix*) and Wandering Trad (*Tradescantia fluminensis*).

Two other species would have been included in Table 4 except for concerns within Council about being able to identify them and hence effectively regulate them. They are the grass species, Chilean Needle-grass (*Nassella neesiana*) and Serrated Tussock (*Nassella trichotoma*). Chilean Needle-grass has not yet been recorded in Knox but it is likely to do so soon and will become a serious problem if not controlled promptly. Serrated Tussock is currently very uncommon in Knox but it has potential to become serious as climate changes.

The proposed amendment would greatly reduce weed regulation across most of Knox and put a much greater focus on infestations that matter. These advantages outweigh the disadvantage of reliance on a map rather than the current blanket approach across the whole municipality.

**Table 4. Proposed schedule of environmental weeds to be regulated within the ‘high risk’ zone of Map 2.** A tick in the first column indicates a species that is already regulated in Knox.

Currently regulated?	Scientific Name	Common Name
✓	<i>Acacia longifolia</i>	Coast Wattle, Sallow Wattle
	<i>Acetosa sagittata</i>	Rambling Dock
	<i>Araujia sericifera</i>	White Bladder-flower
	<i>Asparagus aethiopicus</i>	Sprengeri Fern
	<i>Asparagus asparagoides</i>	Bridal Creeper
	<i>Asparagus declinatus</i>	Bridal Veil
✓	<i>Asparagus scandens</i>	Asparagus Fern
✓	<i>Billardiera fusiformis</i> *	Bluebell Creeper
✓	<i>Cestrum elegans</i>	Red Cestrum
✓	<i>Chrysanthemoides monilifera</i>	Boneseed
✓	<i>Coprosma repens</i>	Mirror-bush
✓	<i>Coprosma robusta</i>	Karamu
	<i>Cortaderia selloana</i>	Pampas Grass
✓	<i>Crataegus monogyna</i>	Hawthorn
✓	<i>Crocasmia × crocosmiiflora</i>	Montbretia
✓	<i>Cytisus scoparius</i>	English Broom
✓	<i>Delairea odorata</i>	Cape Ivy
✓	<i>Echium plantagineum</i>	Paterson’s Curse
✓	<i>Erica lusitanica</i>	Spanish Heath
✓	<i>Fraxinus angustifolia</i>	Desert Ash
✓	<i>Genista linifolia</i>	Flax-leafed Broom
✓	<i>Genista monspessulana</i>	Montpellier Broom
✓	<i>Hedera helix</i>	Ivy
✓	<i>Lonicera japonica</i>	Japanese Honeysuckle
	<i>Myriophyllum aquaticum</i>	Parrot’s-feather
✓	<i>Passiflora tarminiana</i>	Banana Passionfruit
✓	<i>Pittosporum undulatum</i>	Sweet Pittosporum
✓	<i>Rubus fruticosus</i> group	Blackberry
	<i>Salix</i> species (non-weeping)	Willows
	<i>Solanum mauritianum</i>	Tobacco-bush
	<i>Tradescantia fluminensis</i>	Wandering Trad
✓	<i>Ulex europaeus</i>	Gorse (Furze)
✓	<i>Watsonia meriana</i>	Bulbil Watsonia
✓	<i>Zantedeschia aethiopica</i>	White Arum Lily

Council’s current approach to weed infestations that breach the local law has been to allow the responsible landowners to avoid penalties if they promptly and effectively deal with the weeds. Council’s Biodiversity team has assisted the landowners with information and advice. These arrangements have been achieving the objectives of the local law and there is no need to change them, other than to take opportunities to use the information in the Appendix below to inform landowners about their weeds.

\* Formerly known as *Sollya heterophylla*.

To summarise, the first action for Council in this plan is:

Action 1. Amend the Administrative Policy Guidelines of the General Provisions Local Law by replacing the existing schedule of environmental weed species with Table 4 and referencing Map 2 (or a variation of it).

### 7.3. Bushland Management Team

The bushland management team's weed control activity in conservation reserves is the most important component of Council's efforts to control environmental weeds. This is principally because it:

- Is directly targeted at the areas of highest conservation value in Knox;
- Is conducted by a team with specialist skills; and
- Receives the majority of funding, staff and resources for environmental weed control.

The actions proposed for the bushland management team are as follows:

Action 2. Review allocation of resources among reserves on the basis of the sites of top environmental priority in Chapter 5 (p. 13), to be considered alongside other factors such as equity for people in all suburbs to have good, local opportunities to connect with nature;

Action 3. Extend that review by using the methodology of Chapter 5 to determine what priority to assign additional reserves;

Action 4. Review allocation of effort to particular species of environmental weed in response to priorities indicated in the Appendix, as refined for individual sites and after taking into account factors such as efficiencies in controlling lesser weeds incidentally while controlling priority weeds;

Action 5. Discuss the principles of Chapters 3-6, in simple terms, with members of 'Friends' groups. In part, this involves a philosophical discussion about what is the point of their weeding. (There can be a tendency of volunteers to focus on the popular reputation of a weed species rather than what is of greatest benefit to conservation values.) The objective is for the volunteers to better understand their work and achieve better, more rewarding results;

Action 6. Continue Council's program of mosaic burning of parts of bushland reserves in collaboration with the Country Fire Authority and Council's Emergency Management department. The primary purposes will be natural regeneration and (in some cases) bushfire safety, followed by environmental weed control. Fire of adequate intensity can eradicate Sweet Pittosporum. If the soil contains seeds of Gorse, broom species or weedy wattles, they will almost all germinate. While this would be a problem if left untreated, it also offers an excellent opportunity for lasting eradication by killing the new generation before they reproduce. Sweet Vernal-grass is exacerbated by an autumn burn and controlled by a spring burn;

Action 7. Where dense scrubs of Hedge Wattle (*Acacia paradoxa*), Sweet Bursaria (*Bursaria spinosa*) and/or Burgan (*Kunzea leptospermoides/ericoides*) are to be thinned for ecological and/or bushfire hazard reasons, the preferred method is to use a 'groomer' machine (where safe to do so) followed by monitoring and cut-stump herbicide application if required. The

monitoring should be documented and reviewed after approximately two years to contribute towards a soundly based understanding of the *pros* and *cons* of this technique;

Action 8. Continue the team's ecological monitoring of bushland so that efforts can be adjusted according to observed changes related to environmental weeds. Where relevant, monitoring should include 'overall fuel hazard assessments' following prescribed burns or other major weed removal activities to determine whether regrowth becomes a fire hazard.

#### **7.4. Biodiversity Department**

The bushland management team discussed in Section 7.3 is part of the Biodiversity department. This section deals with the rest of that department and with liaison between the bushland management team and other sections of Council.

The actions proposed for the Biodiversity department are as follows:

Action 9. Provide community-friendly information that distils the basics of this environmental weed plan, e.g. through Council's website;

Action 10. Use the community-friendly information from Action 9 during community engagement regarding environmental weeds, particularly with Friends groups and participants in the 'Gardens for Wildlife', 'Biodiversity Buddies' and biodiversity rate rebate programs;

Action 11. If the proposal to amend the Administrative Policy Guidelines of the General Provisions Local Law (Action 1) is adopted, provide information about it on Council's website

Action 12. Hold an outdoor training session for Council's bushland staff to explain and demonstrate this environmental weed plan, the approach and principles that underpin it, the resources it provides (e.g. the associated spreadsheet) and the implications for the staff's work;

Action 13. Investigate the keenness of other departments of Council for training about the environmental weed plan, and organise training as appropriate and as resources allow;

Action 14. Investigate the prospects of fostering the formation of a Landcare group in Knox, to run educational events and working bees. Also seek cooperation from Parks Victoria and Community Weed Action Dandenongs (CWAD);

Action 15. With the assistance of the Active Open Space team, prepare a business case for funding the removal of 'High' and 'Medium' priority weeds (as identified in the Appendix) from road verges managed by Council. The initial priority is within the 'Waterways – core' and 'Other forests – core' zones of Map 1, and in proximity to properties involved with the 'Gardens for Wildlife', 'Biodiversity Buddies' and biodiversity rate rebate programs;

Action 16. Seek greater liaison with Parks Victoria, Melbourne Water and neighbouring councils about weed management, particularly in connection with grants and particularly in the vicinity of the Dandenong Ranges National Park and the Lysterfield Hills;

Action 17. Use Map 1 and the Appendix (or their GIS equivalents) when advising inquirers from inside and outside Council about which species can be environmental weeds at a

particular location. Key staff are capable of responding to tricky inquiries about land that is atypical for its zone or on the margin between two zones.

Action 18. Discuss with relevant plant nurseries (wholesale and retail) whether they carry plant species of 'Medium' or 'High' priority for their zone on Map 1, and if so, whether any action can be taken to reduce the threat, e.g. by putting the higher priority species further from bushland.

Action 19. By 2018, extend the monitoring of bushland reserves that was done in 1999, 2002, 2007 and 2014, so that efforts can be adjusted according to observed changes related to environmental weeds;

Action 20. By 2020, conduct a review of the effectiveness of this environmental weed plan and any improvements that can be made to the methodology.

### **7.5. Park Services – Passive Open Space**

The Passive Open Space team are largely reactive to requests for their services by other Council departments and the community. Some of those requests may change as a result of other actions in this document. The following are actions that are to be taken independently of any service requests.

Action 21. Provide opportunities for staff who conduct weed control or arrange contract weed control to either attend the training foreshadowed in Action 12 or any similar training or assistance that may be available from the Biodiversity department;

Action 22. Review whether any species of 'High' priority in the Appendix are going untreated within the areas under management (particularly if they come under Table 4 on p. 21). If so, add the populations of those species to the weed control program, or initiate a separate process to control them and follow up. A herbicide other than glyphosate may need to be introduced to the department's arsenal, e.g. if Japanese Honeysuckle (*Lonicera japonica*) needs to be controlled;

Action 23. Check that species selected for planting (e.g. for replacement planting) are not shown in the Appendix to be environmental weeds in the relevant environmental weed zone of Map 1. Check with the Biodiversity department in case of doubt;

Action 24. For weed control around wetlands, minimise the spraying of herbicide on species categorised as 'Aquatic or amphibious - disturbance lovers' in the Appendix, e.g. Drain Flat-sedge (*Cyperus eragrostis*). Such species thrive under regular spraying;

Action 25. If Action 15 results in funding being allocated, implement the associated removal of the specified roadside weeds other than street trees, which are dealt with by the Active Open Space team.

### **7.6. Park Services – Active Open Space**

Action 26. Strawberry Tree (*Arbutus unedo*) is listed in the Knox GreenStreets Policy as a 'trial' street tree species for planting in three 'neighbourhood character precincts'. In accordance with the Appendix of this plan, Strawberry Tree should not be trialled in areas

shown on Map 1 as ‘Waterways – core’ or ‘Other forests – core’, i.e. where seeds could disperse into nearby core areas of natural habitat;

Action 27. Assist the Biodiversity department with Action 15 and implement the weed removal program if it is funded.

### 7.7. Open Space & Landscape Design

Action 28. Check that species selected for planting are not shown in the Appendix to be environmental weeds in the relevant environmental weed zone of Map 1. Check with the Biodiversity department in case of doubt. *Correa* species are special in that cultivated plants of various species and cultivars are destroying the wild *Correa reflexa* population by hybridisation. Avoid planting any *Correa* species within 300 m of the following sites: Bateman Street Bush; W.G. Morris Reserve; Flamingo Reserve; the Old Joes Creek bushland precinct; Blamey Reserve; the corner of Mountain Hwy and Army Rd; and Sugarloaf Hill (including Miller Park);

Action 29. When preparing planting schedules for revegetation areas on weedy sites, avoid high densities of canopy trees that will result in extreme soil dryness in summer and hence favour winter-annual weeds (e.g. Annual Veldt-grass) and geophyte weeds (e.g. Angled Onion and *Oxalis* species) – see Figure 1;



*Figure 1. A typical case of overly dense planting of trees without planted groundcover leading to poor tree growth and intractable, dense winter growth of weeds.*

Action 30. During weed control work in association with landscaping projects, give priority to any species that may be present from the ‘high’ and ‘medium’ priority environmental weeds in the Appendix (as applicable to the relevant zone on Map 1). This includes ensuring that these species are considered during the drafting of weed control clauses in project delivery contracts;

Action 31. When preparing master plans for reserves that include native vegetation, liaise with the Bushland Management team to allocate priorities for environmental weed control among the different parts of the reserve. Chapter 6 will assist with the prioritisation.

## 7.8. Stormwater

Action 32. Check that species selected for planting are not shown in the ‘Waterways – core’ column of the Appendix. Check with the Biodiversity department in case of doubt. Note that *Schoenoplectus tabernaemontani* is becoming an environmental weed and can dominate a small stormwater treatment wetland, so it should no longer be planted;

Action 33. For wetland weed control, avoid specifying intensive or regular spraying of herbicide on species categorised as ‘Aquatic or amphibious - disturbance lovers’ in the Appendix, e.g. Drain Flat-sedge (*Cyperus eragrostis*). Such species thrive under regular spraying.

## 7.9. Strategic Planning

Action 34. When overlays in the ESO, VPO or SLO categories are next reviewed, take the opportunity to insert a decision guideline such as, ‘*Promoting the removal of noxious and environmental weeds and avoiding the planting of such species*’, to areas that are largely or wholly within the ‘wet’ or ‘dry’ environmental weed zones of Map 2. A decision guideline with very similar wording already applies under schedule 6 of the SLO. In some cases, it may be appropriate for an overlay schedule to reference this environmental weed plan, or specifically Map 2. By that time, Map 2 may also appear in an amended Local Law (Action 1).

In other respects, the current Knox Planning Scheme provides adequate guidance regarding environmental weeds. No change is needed to the lists of environmental weed species that are currently in the schedule to Clause 52.17 of the Knox Planning Scheme and Schedule 4 to the Vegetation Protection Overlay.

## 7.10. Statutory Planning

Action 35. At pre-application stage of development proposals on land containing environmental weeds, express Council’s preference for the weeds to be removed. The degree of preference is to be guided by Map 1 and the Appendix (or matching spreadsheet). The removal of some species in the ‘low’ (or rarely ‘medium’) priority category may be undesirable in some cases due to overriding considerations. Also indicate Council’s expectation that any ‘offsets’ or compensatory landscaping or revegetation will take into account the environmental weeds indicated by the Appendix and Map 1;

Action 36. Do not approve landscape plans that propose to plant environmental weed species indicated in the relevant column of the Appendix, by reference to Map 1;

Action 37. When pursuing compliance or enforcement of permit conditions related to vegetation, take into account the information in the Appendix and Map 1.

### ***7.11. Emergency Management***

Action 38. In areas identified as having an unacceptable flood hazard, investigate whether the removal of environmental weed species (particularly Desert Ash, non-weeping willows or other deciduous trees) can be removed to reduce the hazard;

Action 39. When seeking landowner action to reduce bushfire hazards, favour the removal of environmental weed species over other plants (and particularly indigenous species). Whether a species is an environmental weed at a particular location can be guided by determining the relevant environmental weed zone on Map 1 and looking up the corresponding column in the Appendix. The priority levels indicated in the Appendix can be balanced against the corresponding bushfire hazard;

Action 40. Assist the Bushland Management team with the program of prescribed burns in Action 6.

## 8. Organisations Other Than Council

### 8.1. State Government Agencies

Some of the top priority sites for environmental weed control identified in Chapter 5 involve land managed by state government agencies, particularly Parks Victoria, Melbourne Water and VicRoads. High-priority environmental weeds with long dispersal ranges, such as Blackberry, Sweet Pittosporum and Ivy, spread readily between these tenures as well as Council and private land. Control of such readily dispersed weeds benefits greatly from cooperative efforts between landowners or managers, and sometimes it is futile to act without cooperation.

The value of cooperation between these agencies and with local government is well recognised but not well coordinated. For example, the Port Phillip and Western Port Invasive Plant and Animal Strategy of 2011 states that partnerships between organisations are critical, and it proposed the formation of a Regional Invasive Species Management Working Group, but the proposal has not been implemented due to lack of funding.

More generally, Knox City Council has found that coordination with other organisations is very important when both parties have adequate resources to commit to coordinated work, but otherwise it is normally pointless. A ‘Knox Interagency Weeds Group’ ceased for that reason but improved resources could make it important again.

Council has a very effective relationship with Melbourne Water for environmental weed control and capital works along waterways. For example, Council has sometimes undertaken weed control and revegetation adjacent to Melbourne Water works, and Melbourne Water has provided grants for Council to conduct work that included environmental weed control.

An example of very effective coordination between a wider range of organisations is provided by a project in the Dandenong Ranges in 2010–2014. The project was led by Yarra Ranges Council with a \$1m grant – dollar for dollar – under the state government Urban Fringe Weed Management Initiative. Yarra Ranges Council liaised with community groups, Melbourne Water, Parks Victoria and the Department of Environment, Land, Water & Planning to undertake cooperative weed control across tenures in top priority sites, some of it very close to Knox. The grant was partly used for work on land managed by the state government agencies (particularly national park), which allowed those agencies to augment the grant funding with some of their own funding. That brought the total state government funds for the overall project to several million dollars over four years, compared with Council’s \$1m investment. Volunteers in community groups provided further leverage and federal funds were also attracted.

The results of the Yarra Ranges Council project under the Urban Fringe Weed Management Initiative were excellent (Saunders and White 2014).

As a result of an earlier draft of the document you are reading, Knox City Council joined with Yarra Ranges Council and the City of Greater Dandenong to apply for, and win, a grant under the Peri-Urban Weed Partnership program, which is the successor to the Urban Fringe Weed Management Initiative. In addition to the associated funding, the grant puts Knox City Council into the regional interagency meetings and processes that decide the allocation of funds and resources for environmental weed control by participating organisations. It is hoped that this will significantly leverage Council’s own investment in weed management.

If an effort is made to control environmental weeds in the general vicinity of Bowen Av in The Basin (near the Dandenong Ranges National Park and the Yarra Ranges border), cooperation should be sought from VicRoads. That is because the nearby verge of the Mountain Highway is a significant source of environmental weeds dispersing into the area.

The Country Fire Authority is a valuable ally for controlling environmental weeds in bushland areas in Knox. Several brigades have undertaken burns for Council in bushland reserves in recent years and Action 6 on p. 22 anticipates further burns.

All state government agencies involved with environmental weeds in Knox could benefit from Map 1 and the Appendix, which indicate the locations and species that deserve most attention for weed control. The principles and methods in this document will hopefully also be helpful.

## **8.2. Railways**

Management of environmental weeds along the railway line in Knox is done by Metro Trains Melbourne. There is a strong emphasis on keeping the corridor clear of obstructions. Most weed control involves herbicide spraying from a vehicle on the tracks, with little discrimination between species. There has been no attempt to treat the most environmentally sensitive sections of rail verge differently.

Map 1 and the Appendix offer a simple way to focus additional attention on environmental weeds where it could make a substantial difference. The areas most deserving of attention are shown on Map 1 as ‘core’ areas and the Appendix provides a guide as to which of the species present in those areas are of highest priority and easiest to deal with. Taking action on those weeds would require a new allocation of funds.

## **8.3. Ausnet Services**

Following Chapter 5 (p. 13), Ausnet Services’ Rowville Electricity Terminal Station is one of the top few sites in Knox for the environmental benefits that can be gained from environmental weed control. A botanical survey in late 2014 found that most of the site’s rare plants remained (along with some new discoveries) but those plants were at serious risk of being outcompeted by environmental weeds. The company has periodically had the weeds and the native vegetation professionally assessed and there have been concerted efforts to control the environmental weeds. A great deal of environmental benefit would come from renewal of the past efforts.

There are two distinct areas of native vegetation in the terminal station. The poorly drained area near the corner of Wellington Rd and Stud Rd falls into the ‘Waterways – core’ zone of Map 1 and the hillside falls into the ‘Other forests – core’ zone. The Appendix provides general guidance about the priority to be given to each species in those zones. Particularly high priority applies to the more aggressive weed species close to the rare plants in the poorly drained area, where great care is also required to avoid serious collateral damage.

## **8.4. Community Groups**

Volunteers in community groups can make a huge difference to environmental weed management. For example, the Knox Environment Society removed a huge number of large

woody weeds from the highly significant Bateman Street Bush in Wantirna during bi-monthly working bees in the 1990s; and a Friends Group does approximately three-quarters of the weed removal in Lysterfield Park, the Dandenong Police Paddocks and Churchill National Park. The Knox Environment Society has also been a great advocate for Council and state government agencies such as VicRoads to put effort into environmental weed management.

This environmental weed plan should help to promote the issue of environmental weeds. Map 1 and the Appendix should help direct the focus of interested community members toward species and locations where community members can make a really worthwhile difference. It is hoped that Chapter 3 will make community members more confident and competent about planning and conducting environmental weed management, and be conscious of what tasks to leave to experts.

For those reasons, Actions 5, 10 and 14 (starting on p. 22) are specifically directed at Council facilitating greater involvement of community groups in environmental management.

Action 14 involves fostering a new Landcare group. Particularly in The Basin, very high conservation values are suffering greatly from environmental weeds, and cooperative action throughout the neighbourhood could produce vastly better results than the currently fragmented (and sometimes remarkably committed) efforts of individual landowners. Such a group would no doubt find support and kinship with the Community Weed Alliance Dandenongs (CWAD), which is an umbrella organisation of groups with similar interests throughout the Dandenong Ranges.

The Knox Environment Society could play a very helpful role in educating the broader community about environmental weeds, as it has done for many years regarding a range of environmental issues. The Society has a very good working relationship with Council, providing a good conduit for relevant parts of this environmental weed plan to reach the community. Volunteers at the Society's community nursery are at the forefront of providing plant information to the community, so Action 9 (p. 23) is designed to help them (and others) understand environmental weeds and speak knowledgeably about them.

The Society and Council are partners in the Gardens for Wildlife program, which targets all Knox residents. The program will continue to educate and encourage environmental weed removal across the entire municipality.

## 9. Conclusion

This environmental weed plan fulfils the first eight steps of the eleven-step environmental weed planning process of Downey (2010), which is now used throughout NSW and the ACT. The Appendix, Map 1 and Chapter 6 also provide a basis for executing step 9 – ‘Establish and implement site-specific management plans’. Provision is also made for Step 10 (monitoring the effectiveness of on-ground actions) and Step 11 (review, report and modify actions if needed).

Despite the concordance with the eleven-step process, this plan differs substantially from any comparable document that was reviewed during its preparation. The important distinctions are the twin focuses on recognition of environmental weed zones and on the protection of conservation values rather than removal of environmental weeds for its own sake.

The Appendix and Map 1 embody those focuses and they underpin most of the actions proposed in this document.

This unconventional approach has only been possible because of the availability of detailed information about ‘sites of biological significance’, their conservation values and the influences on these conservation values by each environmental weed species. Knox stands out for the availability of twenty years of extensive botanical survey data in which the seriousness of each environmental weed species has been documented at each site. It is exceptional to be able to meld such information with knowledge about weed control and each site’s conservation values and sensitivities.

Because the plan is so innovative, it will be quite important to monitor its success and look for any need to modify the approach. Action 20 proposes a full review by 2020.

The need for regular review is heightened by the acceleration of climate change, which raises issues that have not been encountered before. For example, Wonga Vine (*Pandorea pandorana*) is spreading rapidly westward from its natural range in wet forests of the Dandenong Ranges and is displacing pre-existing indigenous plants as it goes. Is it becoming an environmental weed or should we accept this phenomenon as part of nature adapting to climate change? Such questions need to be confronted and consensus will hopefully arise before this document is updated.

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## Appendix – Tabulation of Weed Species

The table on the following pages shows the features of 321 plant species (or groups of species) that have been assessed for their role as environmental weeds in Knox. It is ordered by scientific name, but the accompanying spreadsheet can be readily reordered, filtered or queried to obtain many kinds of useful lists; e.g. a list of species relevant to a particular zone, ordered according to priority and/or ease of control. Such lists provide practical information about what species to target and the resources required.

Species whose names appear in otherwise empty rows have been assessed as not being worthy of concern as environmental weeds in Knox.

The column headed ‘Noxious status’ indicates species that are declared noxious under the *Catchment and Land Protection Act 1994* of Victoria. ‘C’ indicates a ‘Controlled’ species, which is banned from being planted or sold and carries an obligation for all landowners to keep them under control. ‘R’ indicates a ‘Restricted’ species, which may not be planted or sold but carries no obligation to control.

The six columns under the heading ‘Priority & Seriousness’ correspond to each of the environmental weed zones on Map 1. In those columns, a letter code indicates the priority for control (Chapter 4 on p. 12) and a number indicates the level of environmental harm (Section 3.3 on p. 7). Empty cells indicate that control is expected to yield too little benefit to make it worthwhile, except in special circumstances. The codes have the following meanings:

### Priority Codes

- L: Low priority. These species should not be planted. Control is only warranted if it can be done in conjunction with dealing with the higher priority weeds, or if there is a small population that can be removed fairly easily to prevent it becoming larger. So far as Council is concerned, it only needs to pay attention to these species in its management of conservation reserves and when considering planting (e.g. landscape design or endorsed landscape plans).
- M: Medium priority. These species should not be planted. The removal of these species offers benefits that make the effort worthwhile, and should be a routine part of any effort to control environmental weeds.
- H: High priority. These species should not be planted. Their removal or control is most important because the return on effort is great. Promotional campaigns and community outreach programs regarding environmental weeds should focus on these species, some of which are also recommended to be regulated under the General Provisions Local Law.

### Seriousness Codes

- 1: ‘Alert’: The species is becoming denser and/or more widespread so rapidly that the species is expected to cause a substantial reduction in indigenous flora or fauna within the next few years unless new control measures are introduced. This excludes species that have already done such damage but are no longer actively and very seriously displacing the remaining indigenous flora and fauna;
- 2: ‘Serious’: Either (a) Not worsening as fast as the above (or at all), but still causing substantial displacement of indigenous flora or fauna, either actively or by suppressing ecological recovery; or else (b) Likely to fall into the ‘Alert’ category within ten years if preventative action is not taken;

- 3: 'Moderate': Not as serious as above, but still causing (or likely to cause in future) adverse environmental effects, either by causing active deterioration or preventing ecological recovery;
- 4: 'Minor': Presenting only a minor ecological threat, e.g. weeds that are expected not to spread beyond the edges of paths and tracks; and
- 5: 'Presumed innocuous': Not known to reproduce within the area under consideration, though occasional plants may appear sporadically with very little impact.

Under the heading 'Class of Plant', the term 'forb' means a non-woody plant other than a wind-pollinated grassy plant and 'geophyte' means a plant that dies back to the soil during part of each year before sprouting back.

'Radius of Influence' indicates the maximum distance per decade that each species is expected to disperse from existing plants into, or toward, natural areas where it is not already present (Section 3.2 on p. 5).

'Tractability' indicates the difficulty of achieving safe and effective control of each species, as discussed in Section 3.4 (p. 11).

Scientific name	Common Name	Noxious status	Priority & Seriousness, by zone						Class of Plant	Radius of Influence	Tractability	Special features	
			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer					
<i>Acacia baileyana</i>	Cootamundra Wattle			L4				L4		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Acacia decurrens</i>	Early Black Wattle			M3	L3			M3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental; Avoid confusion with <i>Acacia mearnsii</i>
<i>Acacia elata</i>	Cedar Wattle			M3	L3	M2		H2	L3	Trees and shrubs forming dense colonies	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Acacia floribunda</i>	White Sallow-wattle			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Acacia howittii</i>	Sticky Wattle			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Acacia iteaphylla</i>	Flinders Range Wattle												
<i>Acacia longifolia</i>	Coast/Sallow Wattle			H2	M3	H3		H2	M3	Trees and shrubs forming dense colonies	Up to 50 m	Standard techniques, normal follow-up	Ornamental; Avoid confusion with <i>Acacia melanoxylon</i>
<i>Acacia podalyriifolia</i>	Queensland Silver Wattle												
<i>Acacia prominens</i>	Gosford Wattle									Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Acacia retinodes / provincialis</i>	Wirilda			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Acanthus mollis</i>	Bear's Breach												
<i>Acer negundo</i>	Box Elder							L3		Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Acer pseudoplatanus</i>	Sycamore Maple							H2		Trees and shrubs forming dense colonies	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Acetosa sagittata</i>	Rambling Dock			H3	H3					Perennial climbers and scramblers	50–200 m	Standard techniques, normal follow-up	A recent arrival that could become very serious
<i>Acetosella vulgaris</i>	Sheep Sorrel									Perennial forbs	Up to 50 m	Requires underlying conditions to change	Usually associated with compacted or dumped soil
<i>Agapanthus praecox</i> ssp. <i>orientalis</i>	Agapanthus							M3		Perennial forbs	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Agave americana</i>	Century Plant									Perennial forbs	Already occupies all suitable places currently available	Standard techniques, normal follow-up	Ornamental
<i>Agrostis capillaris</i>	Brown-top Bent			L3				L3		Symptoms of specific types of habitat disruption	Up to 50 m	Requires underlying conditions to change	Symptomatic of compacted ground
<i>Aira caryophyllea</i>	Silvery Hair-grass			L3				L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Aira cupaniana</i>	Small Hair-grass			L4				L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Aira elegantissima</i>	Delicate Hair-grass			L3				L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Aira praecox</i>	Early Hair-grass							L4		Persistent annual grasses & sedges	Already occupies all suitable places currently available	Requires underlying conditions to change	Usually in very shallow, sandy soil over rock
<i>Allium triquetrum</i>	Angled Onion	R		M2		M2		L3		Geophyte forbs	Up to 50 m	Difficult, perhaps lots of follow-up	Smelly
<i>Alopecurus geniculatus</i>	Marsh Fox-tail												
<i>Alopecurus pratensis</i>	Meadow Fox-tail			L3				L4		Symptoms of specific types of habitat disruption	50–200 m	Difficult, perhaps lots of follow-up	Symptomatic of being sown and fertilised in pasture
<i>Amaryllis belladonna</i>	Naked Ladies												Ornamental
<i>Anagallis arvensis</i> – see <i>Lysimachia</i>													
<i>Anagallis minima</i>	Chaffweed									Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass			M3				M1		Perennial grasses, sedges and rushes	50–200 m	Difficult, perhaps lots of follow-up	Fire hazard
<i>Araujia sericifera</i>	White Bladder-flower			H2	H3					Perennial climbers and scramblers	50–200 m	Standard techniques, normal follow-up	Kills butterflies and moths; Likely to increase with climate change
<i>Arbutus unedo</i>	Irish Strawberry Tree			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Arctotheca calendula</i>	Cape Weed			L3				L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Arrhenatherum elatius</i> var. <i>bulbosum</i>	Onion Twitch, False Oat-grass			L3				L3		Perennial grasses, sedges and rushes	Already occupies all suitable places currently available	Standard techniques, normal follow-up	
<i>Artemisia verlotiorum</i>	Chinese Wormwood			L4						Trees and shrubs not becoming dense	Up to 50 m	Easy	

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Arundo donax</i>	Giant Reed								Perennial grasses, sedges and rushes	Already occupies all suitable places currently available	Difficult, perhaps lots of follow-up	
<i>Asparagus aethiopicus</i>	Sprengeri Fern			H3	H3	H3	H3	H3	Geophyte climbers	50–200 m	Standard techniques, normal follow-up	A 'Weed of National Significance'; Ornamental
<i>Asparagus asparagoides</i>	Bridal Creeper	R		H2	H3	H2	H2	H3	Geophyte climbers	200–500 m	Standard techniques, normal follow-up	A 'Weed of National Significance'; Ornamental
<i>Asparagus declinatus</i>	Bridal Veil			H3	H3	H3	H3	H3	Geophyte climbers	200–500 m	Standard techniques, normal follow-up	A 'Weed of National Significance'; Ornamental
<i>Asparagus scandens</i>	Asparagus Fern			H2	H3	H2	H2	H3	Geophyte climbers	200–500 m	Standard techniques, normal follow-up	A 'Weed of National Significance'; Ornamental
<i>Asphodelus fistulosus</i>	Onion Weed	R						M3	Disturbance lovers	Up to 50 m	Standard techniques, normal follow-up	
<i>Aster subulatus</i>	Aster-weed			M3				L4	Aquatic or amphibious - disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	Restricted to seasonally wet ground
<i>Atriplex prostrata</i>	Hastate Orache								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Avena barbata</i>	Bearded Oat			M3				L3	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Standard techniques, normal follow-up	
<i>Avena fatua</i>	Wild Oat											
<i>Avena sterilis</i>	Sterile Oat			M3				M3	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Standard techniques, normal follow-up	
<i>Bellis perennis</i>	English Daisy								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Berberis darwinii</i>	Darwin's Barberry							M3	Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Bidens tripartita</i>	Trifid Burr-marigold			H2	H2				Aquatic or amphibious - non-grassy annuals	Over 500 m by wind or fauna	Uncertain	Eradicated from Knox; Aim to prevent recolonisation
<i>Billardiera fusiformis</i>	Bluebell Creeper			H2	H3	H3	H2	H3	Perennial climbers and scramblers	200–500 m	Standard techniques, normal follow-up	Ornamental
<i>Brassica fruticulosa</i>	Twiggy Turnip			L3				L3	Persistent annual or biennial forbs	Up to 50 m	Uncertain	
<i>Briza maxima</i>	Large Quaking-grass			L3				L3	Persistent annual grasses & sedges	Up to 50 m	Difficult, perhaps lots of follow-up	
<i>Briza minor</i>	Lesser Quaking-grass							L4	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Bromus catharticus</i>	Prairie Grass			M3				L3	Perennial grasses, sedges and rushes	Up to 50 m	Standard techniques, normal follow-up	
<i>Bromus diandrus</i>	Great Brome			L3				L3	Persistent annual grasses & sedges	Up to 50 m	Standard techniques, normal follow-up	
<i>Bromus hordeaceus</i>	Soft Brome								Persistent annual grasses & sedges	Stays within a few metres of recent disturbance (e.g. paths)	Standard techniques, normal follow-up	
<i>Callitriche stagnalis</i>	Pond (or Common) Water-starwort			L2				L3	Aquatic or amphibious - non-grassy annuals	Over 500 m by water; otherwise slower	Usually intractable	
<i>Calystegia silvatica</i>	Greater Bindweed			M2				L3	Perennial climbers and scramblers	Over 500 m by water; otherwise slower	Difficult, perhaps lots of follow-up	Ornamental
<i>Capsella bursa-pastoris</i>	Shepherd's Purse								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Cardamine flexuosa / hirsuta</i>	Bitter-cress			L3				L3	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Catapodium rigidum</i>	Fern Grass			L3				L3	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Cenchrus clandestinus</i>	Kikuyu			M2				M3	Perennial grasses, sedges and rushes	Up to 50 m	Standard techniques, normal follow-up	Useful lawn species
<i>Centaurium erythraea</i>	Common Centaury			L3				L3	Persistent annual or biennial forbs	Up to 50 m	Easy	
<i>Centaurium tenuiflorum</i>	Branched Centaury			L4				L4	Persistent annual or biennial forbs	Up to 50 m	Easy	
<i>Cerastium glomeratum</i>	Mouse-ear Chickweed			L3				L3	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Cestrum elegans</i>	Red Cestrum			H3	M3	H1	H3	M3	Perennial climbers and scramblers	200–500 m	Standard techniques, normal follow-up	Ornamental
<i>Chamaecytisus palmensis</i>	Tree Lucerne			M3	M3	M3	M3	M3	Trees and shrubs forming dense colonies	50–200 m	Standard techniques, normal follow-up	

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Chenopodium album</i>	Fat Hen								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Chenopodium murale</i>	Sowbane											
<i>Chlorophytum comosum</i>	Spider Plant			L4			L4		Perennial forbs	Already occupies all suitable places currently available	Standard techniques, normal follow-up	
<i>Chrysanthemoides monilifera</i>	Boneseed	C		H2	H3	H3	H2	H3	Trees and shrubs forming dense colonies	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Cicendia filiformis</i>	Slender Cicendia			L4					Aquatic or amphibious - disturbance lovers		Requires underlying conditions to change	
<i>Cicendia quadrangularis</i>	Square Cicendia			L4					Aquatic or amphibious - disturbance lovers		Requires underlying conditions to change	
<i>Cirsium vulgare</i>	Spear Thistle	C		H2	M2	M3	M3	L3	Persistent annual or biennial forbs	Over 500 m by wind or fauna	Standard techniques, normal follow-up	Only persistent along waterways; Biennial; Has painful spines
<i>Clematis decipiens</i>	a small-leafed clematis			L3	L3		L3	L3	Perennial climbers and scramblers	200–500 m	Standard techniques, normal follow-up	Indigenous to part of Knox, now spreading
<i>Coleonema pulchellum</i>	Pink Diosma											
<i>Conium maculatum</i>	Hemlock	C		H3	M3				Persistent annual or biennial forbs	Up to 50 m	Difficult, perhaps lots of follow-up	Poisonous - do not touch
<i>Conyza</i> - all species	Fleabane			L3		L3	L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Coprosma repens</i>	Mirror-bush			M3	L3	M2	M3	L3	Trees and shrubs not becoming dense	50–200 m	Easy	Ornamental
<i>Coprosma robusta</i>	Karamu			H2	H3	H2	H3	M3	Trees and shrubs forming dense colonies	200–500 m	Standard techniques, normal follow-up	Ornamental
<i>Cordyline australis</i>	New Zealand Cabbage Tree			L3	L3	L3	L3	L3	Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Correa</i> - all kinds except the local one	Correa			M2	M2	M2	M2	M2	Trees and shrubs forming dense colonies	200–500 m	Easy	Pollen is destroying wild populations. Ornamental.
<i>Cortaderia selloana</i>	Pampas Grass		M3	H2	H3	H3	H2	H3	Perennial grasses, sedges and rushes	Over 500 m by wind or fauna	Standard techniques, normal follow-up	Ornamental
<i>Cotoneaster franchetii</i>	Grey Cotoneaster											
<i>Cotoneaster glaucophyllus</i>	Cotoneaster			M2	M3	M2	M2	M3	Trees and shrubs forming dense colonies	200–500 m	Standard techniques, normal follow-up	Ornamental
<i>Cotoneaster pannosus</i>	Cotoneaster			M2	M3	M2	M2	M3	Trees and shrubs forming dense colonies	200–500 m	Standard techniques, normal follow-up	Ornamental
<i>Cotoneaster simonsii</i>	Cotoneaster			L3	L3	L3	L3	L3	Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Cotula coronopifolia</i>	Water Buttons			L4					Aquatic or amphibious - non-grassy perennials	Over 500 m by water; otherwise slower	Difficult, perhaps lots of follow-up	Possibly indigenous
<i>Crassula multicava</i>	Shade Crassula			M3	L3	M3	M3	L3	Perennial creepers	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Crataegus monogyna</i>	Hawthorn	C	M3	H2	M3	H3	H2	H3	Trees and shrubs forming dense colonies	200–500 m	Standard techniques, normal follow-up	A hedge associated with Millers' Homestead has heritage value
<i>Crepis capillaris</i>	Smooth Hawksbeard			L3		L3	L3		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Crococsmia × crocosmiiflora</i>	Montbretia			M2		M2	M2		Perennial forbs	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Cynodon dactylon</i>	Couch			M2		L3	L3		Perennial grasses, sedges and rushes		Difficult, perhaps lots of follow-up	
<i>Cynosurus echinatus</i>	Rough Dog's-tail			L3		L3	L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Cyperus congestus</i>	Dense Flat-sedge			L3		L3	L4		Aquatic or amphibious - disturbance lovers	Over 500 m by water; otherwise slower	Requires underlying conditions to change	
<i>Cyperus eragrostis</i>	Drain Flat-sedge			L3		L3	L4		Aquatic or amphibious - disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Cyperus tenellus</i>	Tiny Flat-sedge			L3		L4	L4		Aquatic or amphibious - disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Cytisus scoparius</i>	English Broom	C		H2	H3	H2	H2	H3	Trees and shrubs forming dense colonies	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental in flower
<i>Dactylis glomerata</i>	Cocksfoot			M3		M3	L3		Perennial grasses, sedges and rushes	50–200 m	Requires underlying conditions to change	A valuable pasture grass in damper conditions

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Danthonia decumbens</i>	Heath Grass			L3		L3	L3		Perennial grasses, sedges and rushes	50–200 m	Requires underlying conditions to change	
<i>Daucus carota</i>	Carrot			L3					Persistent annual or biennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Delairea odorata</i>	Cape Ivy		M3	H3	H3	H1	H3	H3	Perennial climbers and scramblers	200–500 m	Standard techniques, normal follow-up	Ornamental
<i>Digitaria sanguinalis</i>	Summer-grass			L4			L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Dipogon lignosus</i>	Common Dipogon			L4		L4	L4		Perennial climbers and scramblers	Up to 50 m	Easy	Ornamental
<i>Dittrichia graveolens</i>	Stinkweed			L3		L4	L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Dodonaea viscosa</i>	Sticky Hop-bush						L4		Trees and shrubs not becoming dense	Up to 50 m	Easy	
<i>Echinochloa crus-galli</i>	Common Barnyard Grass			L3					Aquatic or amphibious - disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Echium plantagineum</i>	Paterson's Curse	C	M4	M3	M4	M4	M3	M4	Persistent annual or biennial forbs	Up to 50 m	Standard techniques, normal follow-up	
<i>Egeria densa</i>	Dense Waterweed			L2					Aquatic or amphibious - non-grassy perennials	Over 500 m by water; otherwise slower	Usually intractable	
<i>Ehrharta erecta</i>	Panic Veldt-grass			L2		L3	L2		Symptoms of specific types of habitat disruption	Already occupies all suitable places currently available	Requires underlying conditions to change	Strongly associated with Cherry Ballarts and shady, quite unnatural conditions
<i>Ehrharta longiflora</i>	Annual Veldt-grass			L3		L3	M1		Persistent annual grasses & sedges	Up to 50 m	Difficult, perhaps lots of follow-up	Becoming more prevalent; Cannot be controlled with fire
<i>Eleusine tristachya</i>	American Crow's-foot Grass											
<i>Epilobium ciliatum</i>	Glandular Willow-herb			L3		L3			Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Eragrostis curvula</i>	African Love-grass	C		H3			H3		Perennial grasses, sedges and rushes	Up to 50 m	Standard techniques, normal follow-up	Not yet found in habitat in Knox
<i>Erica lusitanica</i>	Spanish Heath		M3	H3	H3	H2	H2	H3	Trees and shrubs forming dense colonies	200–500 m	Difficult, perhaps lots of follow-up	
<i>Erigeron karvinskianus</i>	Seaside Daisy			L4		L4	L4		Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Eriobotrya japonica</i>	Loquat			M3	L3		M3		Trees and shrubs not becoming dense	50–200 m	Easy	Grown for fruit
<i>Erodium moschatum</i>	Musky Heron's-bill			L4			L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Eucalyptus botryoides</i>	Bangalay								Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Ornamental. Occasionally germinates near parent trees that were planted
<i>Eucalyptus cladocalyx</i>	Sugar Gum								Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Ornamental. Occasionally germinates near parent trees that were planted
<i>Eucalyptus globulus</i>	Blue Gum								Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Ornamental. Occasionally germinates near parent trees that were planted
<i>Euphorbia peplus</i>	Petty Spurge								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Festuca arundinacea</i>	Tall Fescue			L3		L5	L4		Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Useful for rough lawn. In habitat, confined to quite modified conditions where it was planted
<i>Festuca rubra</i>	Red Fescue			L4		L5	L3		Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Useful for fine lawn, rarely naturalising
<i>Foeniculum vulgare</i>	Fennel	R		L3			L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Standard techniques, normal follow-up	

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Fraxinus angustifolia</i>	Desert Ash			H2	M2	M3	M3	L3	Trees and shrubs forming dense colonies	200–500 m	Standard techniques, normal follow-up	Excludes the ornamental 'Raywood' variety or Claret Ash
<i>Freesia</i>	Freesia			L4			L4	M3	Geophyte forbs	Up to 50 m	Standard techniques, normal follow-up	
<i>Fumaria</i> - all species	Fumitory			L2			L3	L3	Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Galenia pubescens</i>	Galenia								Perennial creepers			
<i>Galium aparine</i>	Cleavers			M2	M3	M2	M3	M3	Annual creepers, climbers and scramblers	50–200 m	Standard techniques, normal follow-up	
<i>Galium murale</i>	Small Bedstraw			L4			L4	L4	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Gamochaeta purpurea</i>	Spiked Cudweed			L4			L4	L4	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Genista linifolia</i>	Flax-leafed Broom	C		H2	M3	H2	H2	M3	Trees and shrubs forming dense colonies	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Genista monspessulana</i>	Montpellier Broom	C		H2	M3	H2	H2	M3	Trees and shrubs forming dense colonies	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Geranium dissectum</i>	Cut-leaf Crane's-bill			L3			L4	L4	Annual creepers, climbers and scramblers	Stays within a few metres of recent disturbance (e.g. paths)	Standard techniques, normal follow-up	
<i>Geranium molle</i>	Dovesfoot			L4					Annual creepers, climbers and scramblers	Stays within a few metres of recent disturbance (e.g. paths)	Standard techniques, normal follow-up	
<i>Geranium robertianum</i>	Herb Robert								Annual creepers, climbers and scramblers	Already occupies all suitable places currently available	Standard techniques, normal follow-up	Ornamental
<i>Geranium yeoi</i>	Geranium								Annual creepers, climbers and scramblers	Already occupies all suitable places currently available	Standard techniques, normal follow-up	Ornamental
<i>Gladiolus undulatus</i>	Wild Gladiolus			L2			L3	L3	Geophyte forbs	Up to 50 m	Usually intractable	
<i>Glyceria declinata</i>	Manna Grass			H3	H3	H3	H3	H3	Aquatic/amphibious - perennial grassy	Up to 50 m	Difficult, perhaps lots of follow-up	Currently rare in Knox but may spread
<i>Grevillea robusta</i>	Southern Silky Oak								Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea			L4			L3	L3	Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Hakea salicifolia</i>	Willow-leaf Hakea			L4			L4	L4	Trees and shrubs forming dense colonies	Up to 50 m	Standard techniques, normal follow-up	Usually spread by seeds in mulch made from parent plants
<i>Hedera helix</i>	Ivy	M3		H1	H2	H2	H2	H2	Perennial climbers and scramblers	200–500 m	Difficult, perhaps lots of follow-up	Sometimes deemed ornamental
<i>Hedychium gardnerianum</i>	Ginger Lily											
<i>Helminthotheca echioides</i>	Ox-tongue			L3			L3	L4	Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Holcus lanatus</i>	Yorkshire Fog			L3			L4	L4	Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Homalanthus populifolius</i>	Bleeding Heart			L5			L5	L5	Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Occasionally germinates near parent trees that were planted
<i>Hordeum</i> - all species	Barley Grass			L4			L4	L4	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Hypericum androsaemum</i>	Tutsan	C					M3		Trees and shrubs forming dense colonies	50–200 m	Standard techniques, normal follow-up	Toxic to eat
<i>Hypericum perforatum</i>	St John's Wort	C		M3			M3	M3	Geophyte forbs	Up to 50 m	Standard techniques, normal follow-up	Toxic to eat. Not yet found in habitat in Knox
<i>Hypericum tetrapterum</i>	St Peter's Wort	C	M3	M2	M3	M2	M3	M4	Aquatic or amphibious - non-grassy perennials	Over 500 m by water; otherwise slower	Difficult, perhaps lots of follow-up	Toxic to eat
<i>Hypochaeris glabra</i>	Smooth Cat's Ear						L4	L4	Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Hypochaeris radicata</i>	Cat's Ear			L3			L3	M2	Persistent annual or biennial forbs	Up to 50 m	Standard techniques, normal follow-up	
<i>Ilex aquifolium</i>	Holly			L3	L3	M2	L4	L4	Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Sometimes deemed ornamental
<i>Ipomoea indica</i>	Lear's Morning-glory			M3	L3	M2	M3	L3	Perennial climbers and scramblers	Up to 50 m	Standard techniques, normal follow-up	Ornamental. May increase due to climate change
<i>Ixia polystachya</i>	Variable Ixia			L4			L4	L3	Geophyte forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Jasminum polyanthum</i>	Pink (or Winter) Jasmine			L4		L4	L4		Perennial climbers and scramblers	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Juncus acutus</i>	Sharp Rush	C		M3	M3				Aquatic/amphibious - perennial grassy	50–200 m	Standard techniques, normal follow-up	Spines are hazardous
<i>Juncus articulatus</i>	Jointed Rush			L2	L3	L3	L3		Aquatic/amphibious - perennial grassy	Already occupies all suitable places currently available	Usually intractable	
<i>Juncus bulbosus</i>	Bulbous Rush			L3					Aquatic/amphibious - perennial grassy	50–200 m	Usually intractable	
<i>Juncus capitatus</i>	Dwarf Rush			L4		L4	L4		Aquatic or amphibious - disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Juncus microcephalus</i>	Tiny Rush			L3					Aquatic/amphibious - perennial grassy	50–200 m	Usually intractable	
<i>Juncus tenuis</i>	Slender Rush			L3	L3	L3	L4		Perennial grasses, sedges and rushes	50–200 m	Standard techniques, normal follow-up	
<i>Kunzea leptospermoides</i>	Yarra Burgan						L3		Symptoms of specific types of habitat disruption	Up to 50 m	Standard techniques, normal follow-up	Indigenous; It may require thinning where it is dense over substantial areas.
<i>Lactuca serriola</i>	Prickly Lettuce			L4			L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Leontodon taraxacoides</i>	Lesser Hawkbit			L3			L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Lepidium africanum</i>	Common Pepper-cress								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Lepidium didymum</i>	Lesser Swine's-cress								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Ligustrum lucidum</i>	Large-leafed Privet		L4	M3	M4	M3	M3	M4	Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Ligustrum vulgare</i>	European Privet			L3		L4	L3		Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Used in hedges
<i>Lilium formosanum</i>	Lily			L4		L3	L3		Geophyte forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Linum trigynum</i>	French Flax			L4		L4	L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Lolium multiflorum</i>	Italian Rye-grass			L3					Perennial grasses, sedges and rushes	Up to 50 m	Requires underlying conditions to change	Useful as lawn but a cause of asthma and hayfever
<i>Lolium perenne</i>	Perennial Rye-grass			L3			L4		Perennial grasses, sedges and rushes	Up to 50 m	Requires underlying conditions to change	Useful as lawn but a major cause of asthma and hayfever
<i>Lolium rigidum</i>	Wimmera Rye-grass								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	Causes asthma and hayfever
<i>Lonicera japonica</i>	Japanese Honeysuckle		M3	H1	M3	H2	H2	M3	Perennial climbers and scramblers	50–200 m	Difficult, perhaps lots of follow-up	Flowers are fragrant
<i>Lotus angustissimus</i>	Slender Bird's-foot Trefoil								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Lotus corniculatus</i>	Bird's-foot Trefoil			L3		L3	L3		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Lotus subbiflorus</i>	Hairy Bird's-foot Trefoil			L3		L3	L3		Annual creepers, climbers and scramblers	Up to 50 m	Requires underlying conditions to change	
<i>Lotus uliginosus</i>	Greater Bird's-foot Trefoil			L3		L3	L3		Annual creepers, climbers and scramblers	Up to 50 m	Requires underlying conditions to change	
<i>Lysimachia arvensis</i>	Pimpernel			L3		L3	L3		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Lythrum junceum</i>	Mediterranean Loosestrife			L3		L3	L3		Aquatic or amphibious - disturbance lovers	Over 500 m by water; otherwise slower	Uncertain	
<i>Malus pumila</i>	Domestic Apple											
<i>Malva parviflora</i>	Small-flowered Mallow			L3					Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Medicago</i> – all species	Medics			L4			L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Medicago sativa</i>	Lucerne or Alfalfa			L4			L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	

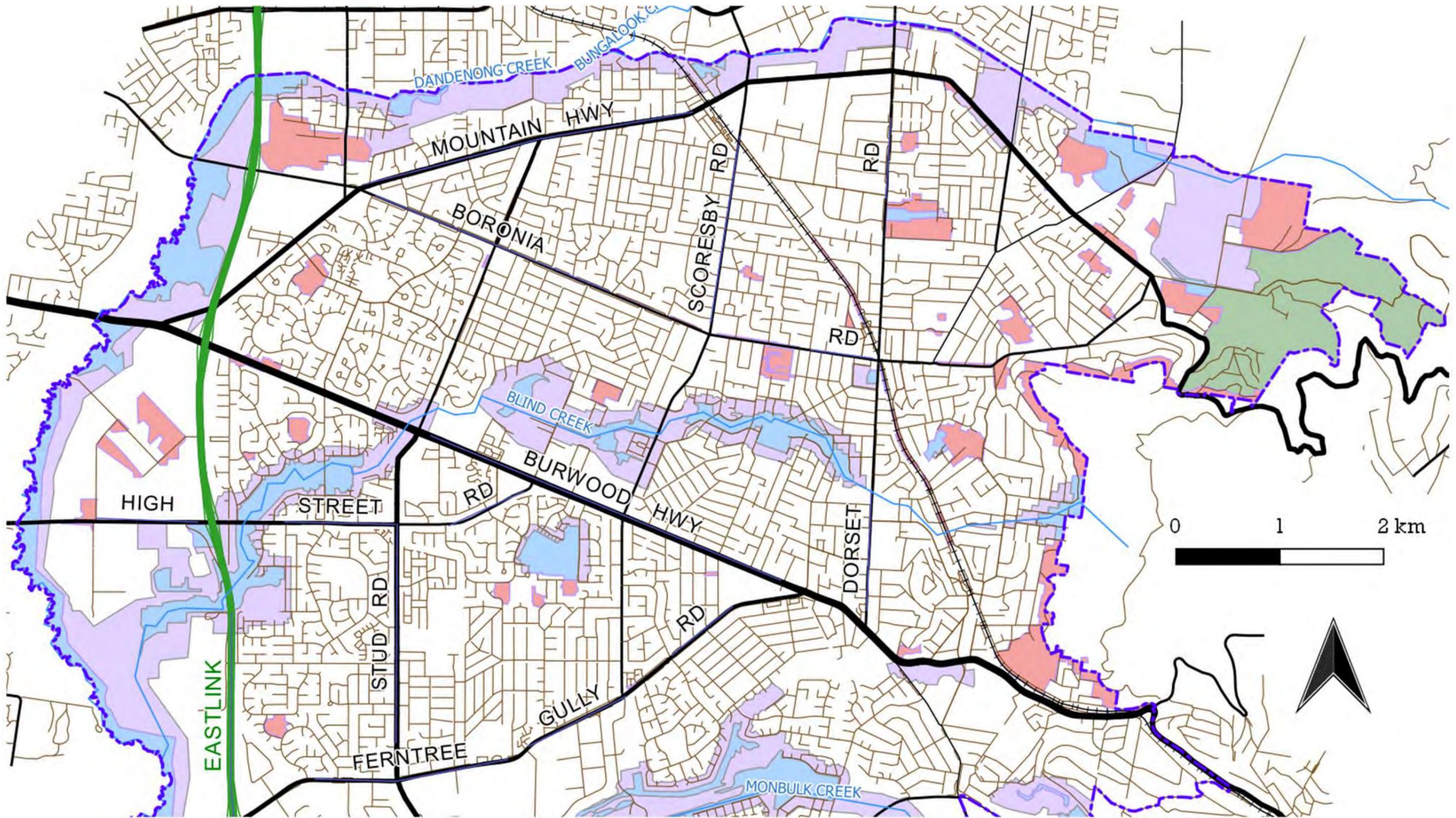
Scientific name	Common Name	Noxious status	Priority & Seriousness, by zone						Class of Plant	Radius of Influence	Tractability	Special features	
			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer					
<i>Melaleuca armillaris subsp. armillaris</i>	Bracelet Honey-myrtle			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Melaleuca decussata</i>	Totem-poles			L3						Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Melissa officinalis</i>	Lemon Balm			L3						Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	A useful herb
<i>Mentha × piperita</i>	Peppermint or Lemon Mint			L3						Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	A useful herb
<i>Mentha pulegium</i>	Pennyroyal			L3						Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	
<i>Mentha spicata</i>	Spearmint			L3						Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	A useful herb
<i>Modiola caroliniana</i>	Carolina Mallow			L4				L4		Persistent annual or biennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Moenchia erecta</i>	Erect Chickweed									Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Muscari armeniacum</i>	Grape Hyacinth									Symptoms of specific types of habitat disruption	Already occupies all suitable places currently available	Requires underlying conditions to change	Ornamental
<i>Myoporum insulare</i>	Common Boobialla			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Myosotis arvensis</i>	Field Forget-me-not			L3					L3	Persistent annual or biennial forbs	Already occupies all suitable places currently available	Uncertain	Ornamental
<i>Myosotis laxa</i>	Water Forget-me-not			L3					L3	Persistent annual or biennial forbs	Over 500 m by water; otherwise slower	Uncertain	Ornamental
<i>Myosotis sylvatica</i>	Wood Forget-me-not			L3				L3		Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Myriophyllum aquaticum</i>	Parrot's-feather			H2	H2			H3		Aquatic or amphibious - non-grassy perennials	Over 500 m by water; otherwise slower	Difficult, perhaps lots of follow-up	An ornamental aquarium species
<i>Nassella neesiana</i>	Chilean Needle-grass	R	H3	H3	H3	H3	H3	H3	H3	Perennial grasses, sedges and rushes	Over 500 m by humans; otherwise slower	Standard techniques, normal follow-up	Not yet recorded in habitat in Knox
<i>Nassella trichotoma</i>	Serrated Tussock	C	H3	H3	H3	H3	H3	H3	H3	Perennial grasses, sedges and rushes	Over 500 m by wind or fauna	Standard techniques, normal follow-up	
<i>Nasturtium officinale</i>	Watercress			L2						Aquatic or amphibious - non-grassy perennials	50–200 m	Usually intractable	
<i>Oxalis articulata</i>	Bent Wood-sorrel			M3				L3	M3	Geophyte forbs	Up to 50 m	Requires underlying conditions to change	
<i>Oxalis corniculata</i>	Creeping Wood-sorrel			L3				L3	L3	Geophyte forbs	Up to 50 m	Requires underlying conditions to change	
<i>Oxalis incarnata</i>	Pale Wood-sorrel			M2				M2	M2	Geophyte forbs	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Oxalis pes-caprae</i>	Soursob	R		M2				M3	M2	Geophyte forbs	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Oxalis purpurea</i>	Large-flower Wood-sorrel			L3				L4	L3	Geophyte forbs	Up to 50 m	Requires underlying conditions to change	Ornamental
<i>Pandorea pandorana</i>	Wonga Vine			L3					L2	Perennial climbers and scramblers	Over 500 m by wind or fauna	Standard techniques, normal follow-up	Ornamental. Indigenous, but has recently changed behaviour. Control only where causing native vegetation to change
<i>Paraserianthes lophantha</i>	Cape Wattle			L3				L4	L3	Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Parentucellia viscosa</i>	Sticky Bartsia			L3						Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Paspalum dilatatum</i>	Paspalum			L2					L3	Perennial grasses, sedges and rushes	Up to 50 m	Requires underlying conditions to change	
<i>Paspalum distichum</i>	Water Couch			M1				M3		Aquatic/amphibious - perennial grassy	50–200 m	Difficult, perhaps lots of follow-up	
<i>Passiflora tarminiana</i>	Banana Passionfruit			L3				H2	L3	Perennial climbers and scramblers	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Paulownia tomentosa</i>	Paulownia			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Persicaria maculosa</i>	Persicaria			L3						Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Petrorhagia dubia</i>	Hairy Pink							L4		Persistent annual or biennial forbs	Up to 50 m	Standard techniques, normal follow-up	
<i>Phalaris aquatica</i>	Toowoomba Canary-grass			L2				L3	M2	Perennial grasses, sedges and rushes	Up to 50 m	Requires underlying conditions to change	

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer					
<i>Phalaris arundinacea</i>	Reed Canary-grass			M3				L3		Perennial grasses, sedges and rushes	Up to 50 m	Standard techniques, normal follow-up	
<i>Phytolacca octandra</i>	Red-ink Weed			M3	M3	M3	M3			Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	
<i>Pinus pinaster</i>	Maritime Pine			M3	M3	M3	M3	M3		Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	
<i>Pinus radiata</i>	Monterey Pine			M2	M3	M2	M2	M3		Trees and shrubs forming dense colonies	50–200 m	Standard techniques, normal follow-up	
<i>Piptatherum miliaceum</i>	Smilo Grass, Rice Millet			L3				L3		Perennial grasses, sedges and rushes	Already occupies all suitable places currently available	Standard techniques, normal follow-up	
<i>Pittosporum tenuifolium</i>	Kohuhu			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Pittosporum undulatum</i>	Sweet Pittosporum			H1	H2	H1	H1	H2		Trees and shrubs forming dense colonies	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Plantago australis</i>	Southern Plantain			L3						Persistent annual or biennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Plantago coronopus</i>	Buck's-horn Plantain			L3				L4		Persistent annual or biennial forbs	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Plantago lanceolata</i>	Ribwort			L3				L3		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Plantago major</i>	Greater Plantain			L3				L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Poa annua</i>	Annual Meadow-grass			L4				L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Poa trivialis</i>	Rough Meadow-grass			L3						Perennial grasses, sedges and rushes	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Polycarpon tetraphyllum</i>	Four-leafed Allseed			L4				L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Polygala myrtifolia</i>	Myrtle-leaf Milkwort			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Polygonum aviculare</i>	Wireweed, Hogweed			L4				L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Polypogon monspeliensis</i>	Annual Beard-grass			L3						Aquatic or amphibious - disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Populus alba</i> 'Pyramidalis'	White Fastigate Poplar			L3						Trees and shrubs forming dense colonies	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Portulaca oleracea</i>	Pigweed (Common Purslane)			L4				L4		Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Potentilla indica</i>	Indian Strawberry			L3				M2	L4	Perennial forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Prunella vulgaris</i>	Self-heal			L3				L3		Disturbance lovers	Already occupies all suitable places currently available	Standard techniques, normal follow-up	
<i>Prunus cerasifera</i>	Cherry-plum			M3	M3	M3	M3	M3		Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Prunus laurocerasus</i>	Cherry Laurel			M3		M3	M4			Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Pseudoscleropodium purum</i>	Neat Feather-moss			L2				L3	L2	Perennial creepers	Up to 50 m	Uncertain	
<i>Psoralea pinnata</i>	Blue Psoralea			L3				L3		Trees and shrubs forming dense colonies	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Pyracantha angustifolia</i>	Orange Firethorn			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Easy	
<i>Quercus robur</i>	English Oak			L3				L3		Trees and shrubs not becoming dense	Up to 50 m	Standard techniques, normal follow-up	Ornamental; Some are of historical significance
<i>Ranunculus muricatus</i>	Sharp Buttercup									Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Ranunculus repens</i>	Creeping Buttercup			L2				L2	L3	Aquatic or amphibious - non-grassy perennials	Up to 50 m	Usually intractable	
<i>Ranunculus sceleratus</i>	Celery Buttercup												
<i>Raphanus raphanistrum</i>	Wild Radish			L4						Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Romulea rosea</i>	Common Onion-grass			L3				L3		Symptoms of specific types of habitat disruption	Up to 50 m	Requires underlying conditions to change	Strongly associated with compacted soil and low competition

Scientific name	Common Name	Noxious status	Priority & Seriousness, by zone						Class of Plant	Radius of Influence	Tractability	Special features
			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Rorippa palustris</i>	Yellow Marsh-cress			L3					Aquatic or amphibious - disturbance lovers	Up to 50 m	Uncertain	
<i>Rosa rubiginosa</i>	Sweet Briar	C		M3			M3		Trees and shrubs not becoming dense	50–200 m	Standard techniques, normal follow-up	
<i>Rubus fruticosus</i> group	Blackberry	C	H3	H1	H2	H1	H1	H2	Trees and shrubs forming dense colonies	200–500 m	Standard techniques, normal follow-up	May provide habitat for birds
<i>Rumex conglomeratus</i>	Clustered Dock			M3		L3	L3		Perennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Rumex crispus</i>	Curled Dock			M3		L3	L3		Perennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Rumex obtusifolius</i>	Broad-leaf Dock			M3		L3	L3		Perennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Rumex pulcher</i>	Fiddle Dock			M3		L3	L3		Perennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Sagina apetala</i>	Common Pearlwort			L4			L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Salix babylonica</i> / 'Chrysocoma'	Weeping Willow			L3	L3				Trees and shrubs not becoming dense	Over 500 m by water; otherwise slower	Standard techniques, normal follow-up	Ornamental
<i>Salix</i> species – non-weeping	Grey Sallow	R		H2	M3				Trees and shrubs forming dense colonies	Over 500 m by water; otherwise slower	Standard techniques, normal follow-up	
<i>Salpichroa origanifolia</i>	Pampas Lily-of-the-Valley	C		L3	L3		L3	L3	Perennial climbers and scramblers	Up to 50 m	Standard techniques, normal follow-up	
<i>Schoenoplectus tabernaemontani</i>	River Club-rush			L3	L3				Aquatic or amphibious - perennial grassy plants	Over 500 m by wind or fauna	Standard techniques, normal follow-up	Spreading rapidly from storm-water treatment wetlands where it has been planted. Indigenous. Do not remove wild plants.
<i>Selaginella kraussiana</i>	Garden Selaginella			L3		H2	L3		Aquatic or amphibious - non-grassy perennials	50–200 m	Uncertain	Ornamental
<i>Senecio jacobaea</i>	Ragwort	C				M3			Persistent annual or biennial forbs	50–200 m	Standard techniques, normal follow-up	
<i>Senecio vulgaris</i>	Common Groundsel								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Setaria parviflora</i>	Slender Pigeon Grass			L3			L3		Perennial grasses, sedges and rushes	50–200 m	Requires underlying conditions to change	
<i>Silybum marianum</i>	Variiegated Thistle	C		M3			M3		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Sisyrinchium iridifolium</i>	Striped Rush-leaf			L3		L3	L3		Perennial forbs	Up to 50 m	Difficult, perhaps lots of follow-up	
<i>Solanum americanum</i>	Glossy Nightshade			L3		L3	L3		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Solanum mauritianum</i>	Tobacco-bush			H2	M3	H2	H3	M3	Trees and shrubs forming dense colonies	50–200 m	Easy	Ornamental
<i>Solanum nigrum</i>	Black Nightshade			L3		L3	L3		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Solanum pseudocapsicum</i>	Madeira Winter-cherry			M3	M3				Trees and shrubs not becoming dense	200–500 m	Standard techniques, normal follow-up	
<i>Soleirolia soleirolii</i>	Baby's Tears			L3					Aquatic or amphibious - non-grassy perennials	200–500 m	Usually intractable	
<i>Soliva sessilis</i>	Jo Jo								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Sonchus asper</i>	Rough Sow-thistle								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Sonchus oleraceus</i>	Sow-thistle			L3		L4	L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Spergularia rubra</i>	Red Sand-spurrey								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Sporobolus africanus</i>	Rat-tail Grass			L3			L3		Perennial grasses, sedges and rushes	50–200 m	Standard techniques, normal follow-up	

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			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Stachys arvensis</i>	Stagger Weed			L4			L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Stellaria media</i>	Chickweed			L4			L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Stenotaphrum secundatum</i>	Buffalo Grass			L3			L3		Perennial grasses, sedges and rushes	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Syzygium smithii</i>	Lilly Pilly						L4		Trees and shrubs not becoming dense	Up to 50 m	Easy	Ornamental
<i>Taraxacum officinale</i>	Garden Dandelion			L3			L4		Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Torilis arvensis</i>	Knotted Parsley			M3	L3	L3	L3		Persistent annual or biennial forbs	200–500 m	Requires underlying conditions to change	
<i>Tradescantia fluminensis</i>	Wandering Jew			M1	M2	M1	H2	M3	Perennial creepers	50–200 m	Difficult, perhaps lots of follow-up	Once popular in hanging baskets
<i>Tragopogon porrifolius</i>	Salsify			L3					Persistent annual grasses & sedges	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Trifolium angustifolium</i>	Narrow-leaf Clover								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Trifolium arvense</i>	Hare's foot Clover								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Trifolium campestre</i>	Hop Clover								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Trifolium dubium</i>	Suckling Clover						L4		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Trifolium fragiferum</i>	Strawberry Clover								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Trifolium glomeratum</i>	Cluster Clover								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Trifolium pratense</i>	Red Clover								Disturbance lovers	Stays within a few metres of recent disturbance (e.g. paths)	Requires underlying conditions to change	
<i>Trifolium repens</i>	White Clover			L3		L3	L3		Perennial creepers	Up to 50 m	Requires underlying conditions to change	
<i>Trifolium subterraneum</i>	Subterranean Clover								Persistent annual or biennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Triticum aestivum</i>	Wheat								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Tropaeolum majus</i>	Nasturtium			L3			M3		Symptoms of specific types of habitat disruption	Already occupies all suitable places currently available	Requires underlying conditions to change	Ornamental, sometimes persisting in abandoned gardens
<i>Typha latifolia</i>	Great Reedmace			M3					Aquatic/amphibious - perennial grassy	Over 500 m by wind or fauna	Difficult, perhaps lots of follow-up	
<i>Typha orientalis</i>	Cumbungi			L3	L3				Aquatic or amphibious - perennial grassy plants	Over 500 m by wind or fauna	Standard techniques, normal follow-up	Indigenous but prone to become over-dominant. Keep in check.
<i>Ulex europaeus</i>	Gorse (Furze)	C	M3	H1	M3	H2	H1	M3	Trees and shrubs forming dense colonies	Up to 50 m	Difficult, perhaps lots of follow-up	Spines pose a hazard
<i>Ulmus procera</i>	Common Elm			L3					Trees and shrubs forming dense colonies	Already occupies all suitable places currently available	Standard techniques, normal follow-up	Ornamental
<i>Verbena bonariensis</i>	Purple-top Verbena			M3		L3	L3		Persistent annual or biennial forbs	Up to 50 m	Requires underlying conditions to change	
<i>Veronica arvensis</i>	Wall Speedwell								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Veronica persica</i>	Persian Speedwell								Disturbance lovers	Already occupies all suitable places currently available	Requires underlying conditions to change	
<i>Viburnum tinus</i>	Laurustinus			L3		L3	L3		Trees and shrubs not becoming dense	Already occupies all suitable places currently available	Standard techniques, normal follow-up	Ornamental

Scientific name	Common Name	Noxious status	Priority & Seriousness, by zone						Class of Plant	Radius of Influence	Tractability	Special features
			Low risk	Waterways, Core	Waterways, Buffer	Tall forests	Other forests, Core	Other forests, Buffer				
<i>Vicia disperma</i>	French Tiny Vetch			L3		L3	L3		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Vicia hirsuta</i>	Tiny Vetch			L3		L3	L3		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Vicia sativa</i>	Common Vetch			L3		L3	L3		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Vicia tetrasperma</i>	Slender Vetch			L3		L3	L3		Disturbance lovers	Up to 50 m	Requires underlying conditions to change	
<i>Vinca major</i>	Blue Periwinkle			M2		M2	M2		Perennial creepers	Up to 50 m	Difficult, perhaps lots of follow-up	Ornamental
<i>Viola odorata</i>	Fragrant Violet			L3		L3	L3		Perennial creepers	Up to 50 m	Standard techniques, normal follow-up	
<i>Vulpia bromoides</i>	Squirrel-tail Fescue			L2		L3	M2		Persistent annual grasses & sedges	Up to 50 m	Difficult, perhaps lots of follow-up	
<i>Vulpia myuros</i>	Rat's-tail Fescue			L3		L3	L3		Persistent annual grasses & sedges	Up to 50 m	Difficult, perhaps lots of follow-up	
<i>Watsonia borbonica</i>	Rosy Watsonia			L3		L3	L3		Geophyte forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Watsonia marginata</i>	Bordered Watsonia			L3		L3	L3		Geophyte forbs	Up to 50 m	Standard techniques, normal follow-up	Ornamental
<i>Watsonia meriana</i>	Bulbil Watsonia	C		M2	M3	L3	H1		Geophyte forbs	50–200 m	Standard techniques, normal follow-up	Ornamental
<i>Zantedeschia aethiopica</i>	White Arum Lily			H2	M3	H2	H3		Perennial forbs	Up to 50 m (greater in a creek)	Difficult, perhaps lots of follow-up	Ornamental



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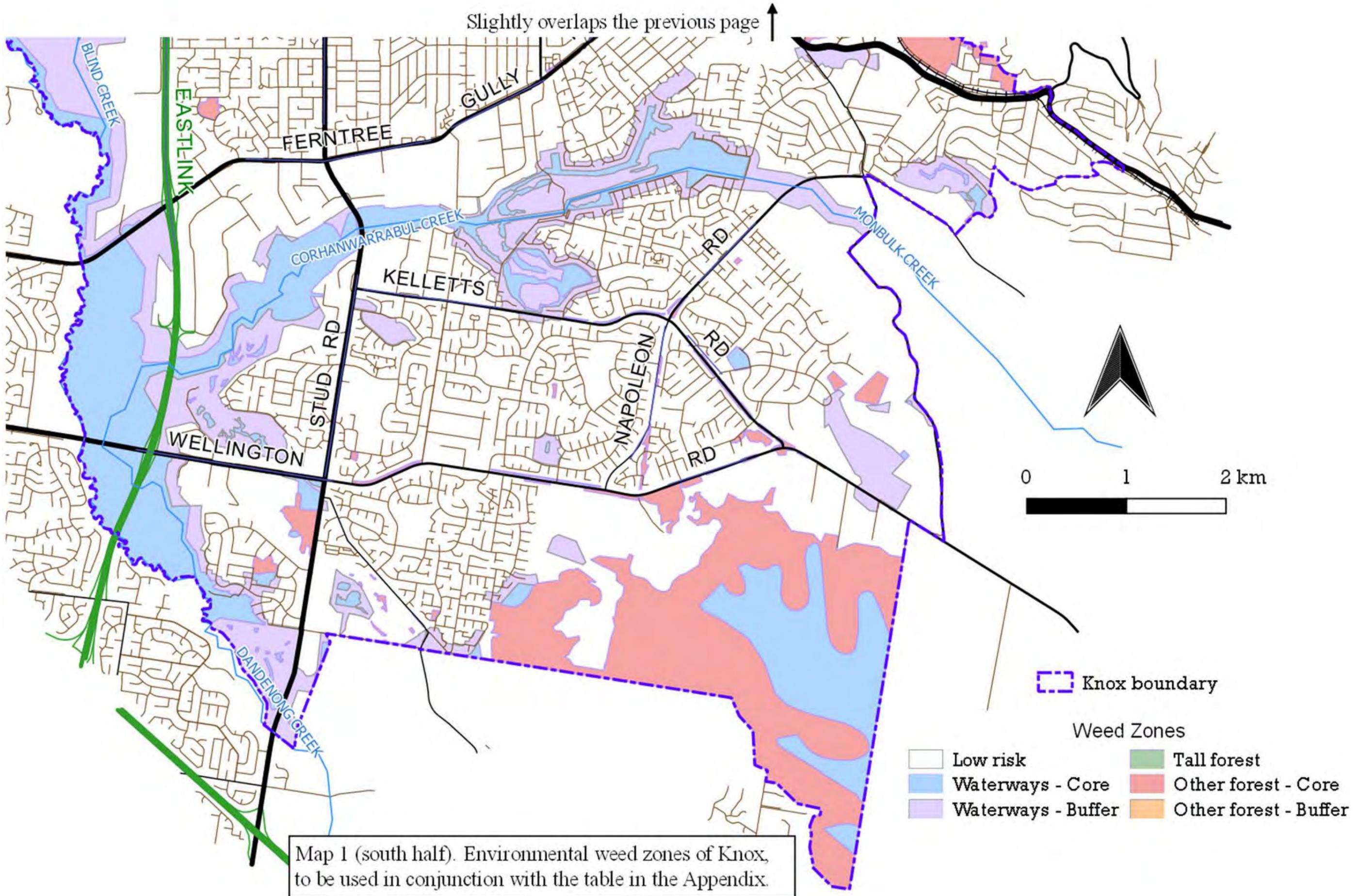
Map 1 (north half). Environmental weed zones of Knox, to be used in conjunction with the table in the Appendix. All parts of Knox that are not shaded form the 'low risk' zone.



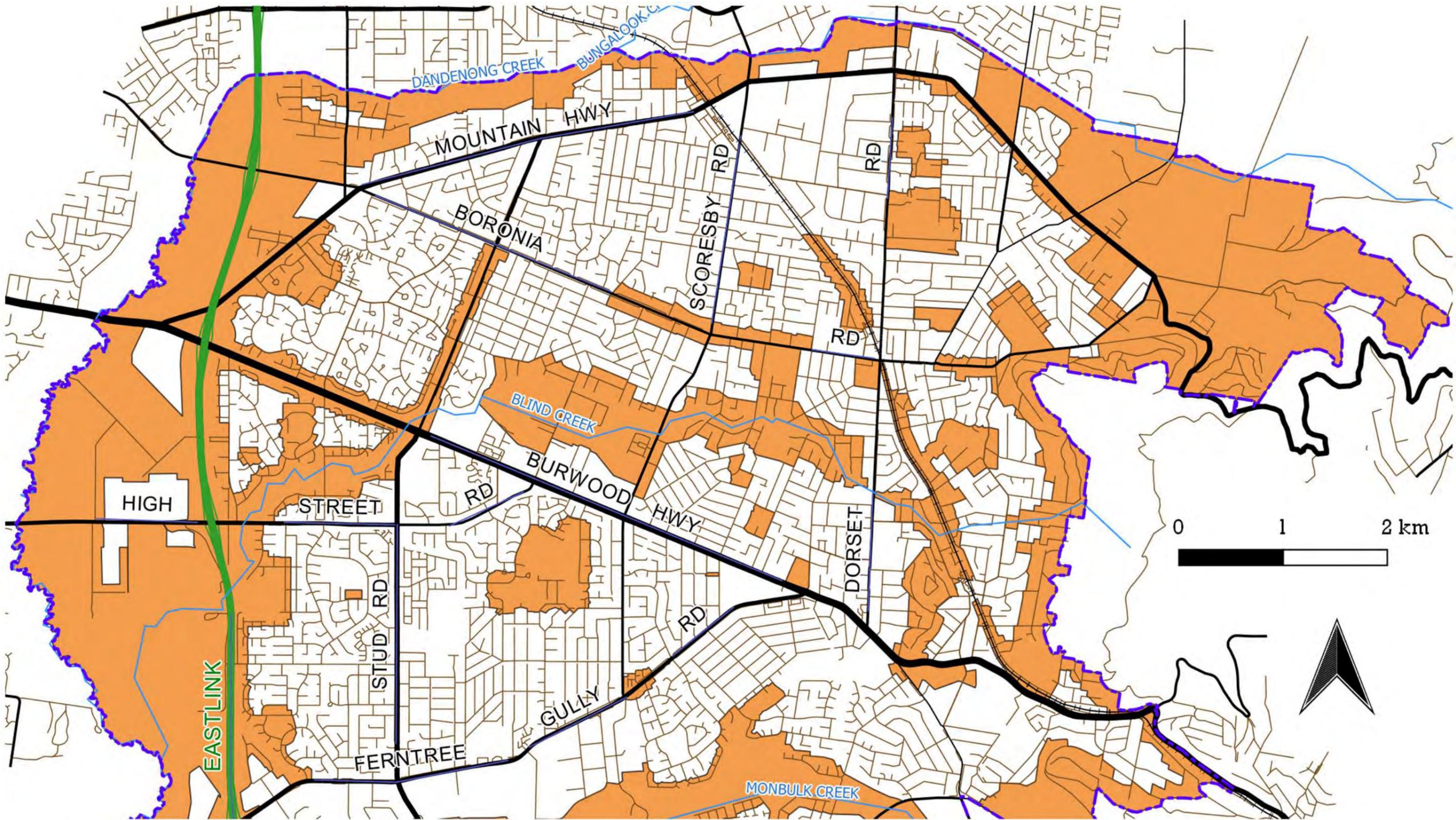
 Knox boundary

- Weed Zones**
-  Low risk
  -  Tall forest
  -  Waterways - Core
  -  Other forest - Core
  -  Waterways - Buffer
  -  Other forest - Buffer

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Map 1 (south half). Environmental weed zones of Knox, to be used in conjunction with the table in the Appendix.



Map 2 (north). Orange represents the 'high risk' zone to be used in conjunction with Table 4 and the General Provisions Local Law. Elsewhere, only Blackberry is proposed to be regulated.

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 Knox boundary

