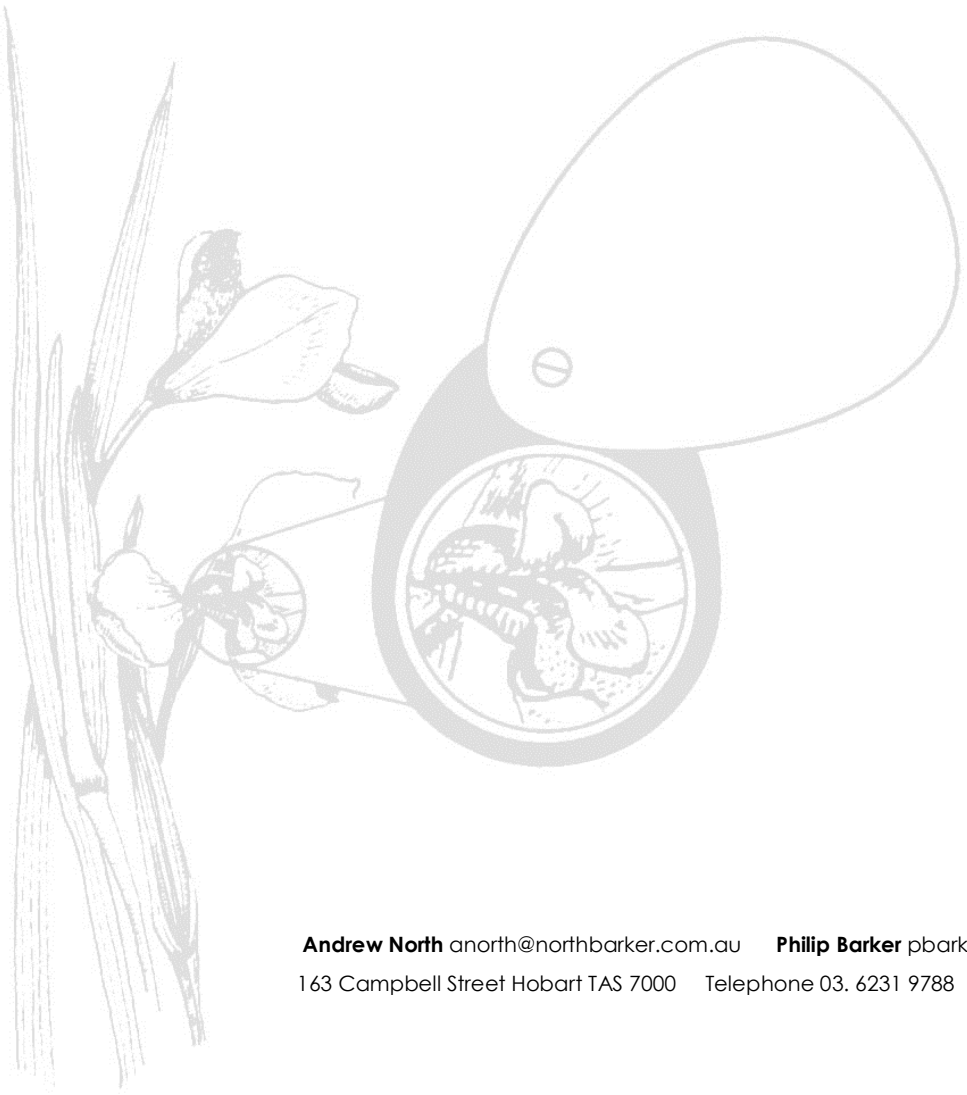
northbarker
ECOSYSTEM SERVICES

Weed Management Strategy and Action Plan
Kingborough Municipal Area
2015 - 2025

February 2016

For Kingborough Council



Andrew North anorth@northbarker.com.au **Philip Barker** pbarker@northbarker.com.au
163 Campbell Street Hobart TAS 7000 Telephone 03. 6231 9788 Facsimile 03. 6231 9877

Document Information

Title	Kingborough Council
	Weed Management Strategy and Action Plan 2015 - 2025

Revision History

Prepared by	Philip Barker (NBES)	June 2015 – January 2016
Consultation	Rene Raichert (KC), Liz Quinn (KC)	May, June, August 2015
Reviewed by	Grant Daniels (NBES)	January 15 2016
Draft 1 distributed to	Rene Raichert	January 20 2016
Draft 2 distributed to	Rene Raichert	February 22 2016
Draft 3 distributed to	Rene Raichert	March 7 2016
Public feedback closes		
Draft 2 distributed post public feedback		
Additional feedback received		
Final draft distributed to		

EXECUTIVE SUMMARY

This weed strategy has been prepared to guide weed management within the Kingborough municipality for the next 10 years.

Kingborough Council has made tremendous progress on tackling weed issues on Council managed land to date. This has been achieved through the combined efforts of volunteer community groups and Council staff, with strategic planning in local Reserves and a coordinated and sustained level of on-ground works. With around three quarters of the municipality supporting native vegetation, but the Council only controlling a few percent of the land area, one important challenge is to take a strategic approach to achieve weed management outcomes across the whole of the municipal area.

Kingborough has existing weed management strategies that separately cover Bruny Island and the "mainland" balance of the municipality. This strategy brings the existing strategies together by prioritising weeds, mapping distributions, and proposing a weed management strategy that covers both areas.

This strategy also identifies other challenges that need to be tackled to allow ongoing progress toward the weed management aims and these are presented as key "planks" to the strategy.

This plan identifies seven key planks to support effective and efficient weed management, and describes management actions to assist in ensuring that the key planks are the foundation of weed management in Kingborough.

Key planks

- **Plank 1** – Best Practice Weed Management
- **Plank 2** – Integrated Weed Management
- **Plank 3** – Planning
- **Plank 4** – Risk Management
- **Plank 5** – Stakeholder Engagement and Partnerships
- **Plank 6** – Education and Training
- **Plank 7** – Monitoring and Review

Priorities and management of weeds

The strategy prioritises the selection of sites for weed management based on the occurrence of selection criteria that include highest weed priority, community priority, threatened flora and vegetation priorities. The co-occurrence of these selection drivers results in higher order selection as a site priority.

Management zones have been defined and prescriptions recommended that mitigate the potential risks of weed management actions that are characteristic of each zone.

Kingborough contains a wide range of introduced plants. Just over 400 species are considered to be naturalised in the municipality. Some of these are well established and widespread. Others are fairly recent introductions, with small populations of limited threat to environmental, economic and/or social values. Thirty-eight of the 115 declared weeds listed under the Tasmanian *Weed Management Act 1999* are naturalised within Kingborough, with 10 of these also Weeds of National Significance (WONS).

This plan has prioritised the 115 weeds into 5 management groups:

1. **Eradicate** any infestation
2. **Eradicate or quarantine** within term of the action plan (10 years)
3. **Eradicate isolated infestations** and contain wider infestations to ensure no further spread within term of the action plan (10 years)
4. **Control and contain** where threatening important values – considered response for all species
5. **Monitor** local environmental weeds. Aim to minimise further spread and control and contain when in association with declared weeds. A small number of concern have been elevated to 1-4 above.

Some **Priority Actions** of the Plan are:

- Undertake a review of the operational aspects of weed management:
  - Identify areas in which efficiency and effectiveness can be improved;
  - Identify where best practices are and are not being applied.
- Train all staff in integrated weed management and how to incorporate this into site treatment plans.
- Develop and embrace annual works and site planning procedures as the basis for operations and monitoring.
- Integrate GIS and databases into planning and monitoring.
- Trial a range of tools to engage and provide incentive to other weed managers, including:
  - Rate rebates;
  - Reverse auctions to undertake weed works;
  - Cooperative or coordinated weed management agreements; and
  - Service agreements.
- Implement an educational strategy focussed on engagement, understanding and interaction using modern media tools.
- Complete a training program aimed at attaining and maintaining best practices knowledge.
- Place more stringent controls on declared and environmental weeds as part of the planning process.
- Map roadside weeds as the basis to a control strategy that reduces the risk of spread.
- Establish wheel wash units and promote the use of commercial car wash to enhance weed hygiene measures.
- Integrate audits and adherence to site plans, and construct a performance indicator based on the cost of improvement in weed control.

ACKNOWLEDGEMENTS

Preparation of this plan was by Philip Barker of North Barker Ecosystem Services, with Susan Jungalwalla undertaking data management and analysis.

Kingborough Council funded the Plan. Project management was undertaken by Rene Raichert and Liz Quinn of Kingborough Council.

Kingborough Council provided supplementary data on weed locations.

Other sources of data include the LIST, Natural Values Atlas and NBES. All sources are acknowledge on maps and in GIS tables.

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

ABBREVIATIONS

DPIPWE	Department of Primary Industries, Parks, Water & Environment
EEG	Efficiency and Effectiveness Gain
GIS	Geographic Information System
KC	Kingborough Council
KLL	Kingborough Local List
KMA	Kingborough Municpal Area
PWS	Parks & Wildlife Service
TSPA	Tasmanian *Threatened Species Protection Act 1995*
WONS	Weeds of National Significance
WMA	Tasmanian *Weed Management Act 1999*
WMP	Weed Management Plan
WMS	Weed Management Strategy
WWP	Weed Work Plan

1 AIM

To implement a Municipal Weed Strategy and Action Plan in which everyone is working together to manage weeds across all land tenures, thereby protecting natural, social and economic values of Kingborough and its neighbours.

This aim and vision reflects the *Southern Tasmanian Weed Strategy 2011-2016*.

2 INTRODUCTION

Kingborough Council (the Council, KC) has made meaningful achievements in controlling weed infestations in their municipal area (KMA). This has been achieved through the combined efforts of volunteer community groups and Council staff, with strategic approaches over local Reserves and a coordinated and sustained level of on-ground works. Despite the achievements that have been made to date, and the considerable resources devoted to weed management, the ubiquity of many environmental weeds is such that it is not possible or practical to plan to eradicate all introduced species from the municipality. It is, however, possible to come to understand the full range of potentially competing priorities for weed management. With that understanding, resources may then be allocated across the range of competing priorities in a fashion that satisfies the vast majority of stakeholders.

This Strategy and Action Plan aims to deliver an approach which includes accepted strategic objectives as well as novel concepts. The approach will be applied to all land within the KMA to protect key assets by controlling threatening weeds. This involves planning for enhanced co-operation of all landowners in order to maximise on-ground resources for weed management in order to achieve high level, sustainable weed outcomes. It also seeks to ensure KC leads by example to encourage other stakeholders to get involved.

3 BACKGROUND AND OBJECTIVES

3.1 Weed Management in Kingborough

To date, the Council have made large strides in weed management within Council owned or managed lands. Included in these efforts has been the progressive implementation of the *Bruny Island Weed Management Strategy*, the *Bruny Island Roadside Weed Management Strategy* and the *Channel Weed Management Strategy*.

Stage 1 of the development of the current Strategy, included a review of the implementation of existing strategies. It also included a review of all relevant legislation and policy frameworks, and an investigation of approaches that could be employed within the KC.

From this it was established that the Strategy would:

- provide a strategic framework that includes objectives, strategies, actions, monitoring and evaluation for the management of weeds throughout the municipality;
- define management zones within the municipality and stratify weed risk assessments by these zones;
- contain an Action Plan that outlines the required management actions to be undertaken; identifying people, budgetary requirements and timing for implementation of the actions in line with priorities and capabilities;

- describe and propose pathways for the delivery of innovative approaches to weed management that engage the community, for example levy funded incentives or works programs; and
- outline a strategy for the implementation of regulatory responses to weed management issues, including consideration of "rezoning" weeds under the *Weed Management Act 1999*.

3.2 Strategic Context

Priorities within weed management plans throughout Australia are generally arranged hierarchically down from the *Australian Weeds Strategy 2007*, through State weed management strategies, to regional and/or local strategies. The objectives and principles of the overarching Australian strategy flow down through the subsequent levels, only being reinterpreted in plans where scale requires.

In relation to KC, the regional guiding strategy is the *Southern Tasmanian Weed Strategy 2011-2016*.

See Appendix 1 for a policy overview.

Southern Tasmanian Weed Management Strategy

The *Southern Tasmanian Weed Strategy* (STWS) is based on principles adopted from the *Australian Weeds Strategy 2007* which was developed by the Australian Weeds Committee. These are (verbatim):

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

Existing KMA strategies

A review identified the need to unify existing weed management strategies (WMS) within the municipality. In particular it referred to the Bruny Island WMS, the Bruny Island Roadside WMS and the Channel WMS. There are, however, also numerous weed management plans for various reserves and specific locations.

Enormous effort has been spent on gathering data and formulating actions in the major strategies. In addition, much work has been completed toward the implementation of the respective aims. One challenge for this Strategy is to not kick the can along the road by restating what has not yet been achieved. Another is to bring forward those parts of each strategy or plan that can be accommodated within a new strategic framework that unifies but updates.

Toward this end, this Strategy and Action Plan brings forward aspects of preceding work to the extent that they can be included in unifying the approach.

3.3 Kingborough Municipal Area - Geography

The Kingborough Municipal Area, situated in southeast Tasmania, covers approximately 717 square kilometres, with a population of approximately 34 000[1].

The municipality extends from the southern slopes of Mount Wellington, south along the spine of the Snug Tiers and east to the Channel, including Bruny Island. The municipality is bordered by Hobart City Council to the north and Huon Council to the south (Figure 1). Defining characteristics include the D'entrecasteaux Channel, which separates the "mainland" portion from Bruny Island, and the Snug Tiers, which forms a prominent ridge that runs parallel to the Channel. This results in high topographic diversity, from the ranges of the Snug Tiers down to the coast and rising again to Mt Mangana on Bruny Island. The geology of the region is generally made up of Permian mudstone, Triassic sandstone, Jurassic dolerite or Tertiary basalt. Low-lying areas typically contain more fertile alluvial deposits.

Kingborough is bordered by approximately 336 km of coastline, including that on Bruny Island. A diversity of anthropogenic and natural environments is present, with three quarters of the municipality consisting of native vegetation (Table 1, Figure 2). This native vegetation is predominantly dry or wet sclerophyll forest, with smaller extents of non-forest types.

[1] Kingborough Council web site 2015

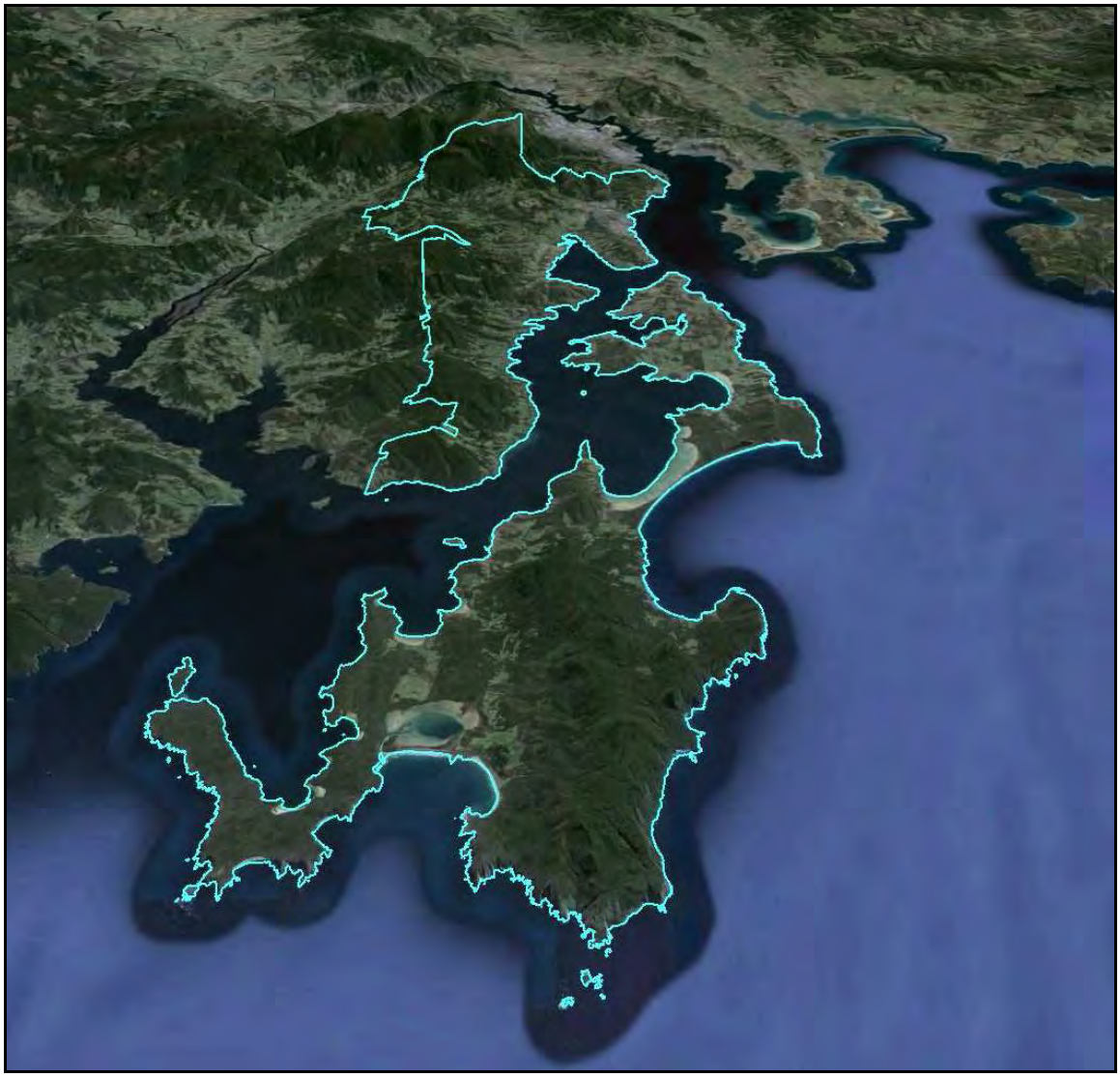


Figure 1 – Kingborough Municipal Area boundary

Tenure

Table 2 summarises stakeholders by the area of the land tenures and the percentage of the total area within the KMA. More detailed statistics are presented in Appendix 2.

Table 1 – TASVEG mapping classes within Kingborough Municipal Area[2]

VEGETATION TYPE	AREA (ha)	%
Agricultural, urban and exotic vegetation	18,076	25
Dry eucalypt forest and woodland	29,025	40
Native grassland	158	0.2
Non eucalypt forest and woodland	639	1
Other natural environments	1,213	1.5
Saltmarsh and wetland	207	0.3
Scrub, heathland and coastal complex	6,164	9
Wet eucalypt forest and woodland	16,623	23
Rainforest	278	0.5
Moorland, sedgeland, rushland and peatland	138	0.2
Total	72,521	100

Table 2 – Stakeholders as Land tenure area (ha) and percent of total area in the KMA

Tenure	Hectares	Percent
Council	2500	3
Forestry Tasmania	2400	3
Parks and Wildlife Service	14,500	29
Private	45,500	61
State Departments	7500	10
Total major stakeholders	**72,500**	**97**
Total in Kingborough	**74,500**	

[2] Based on TASVEG 3.0 (Kitchener and Harris 2013)

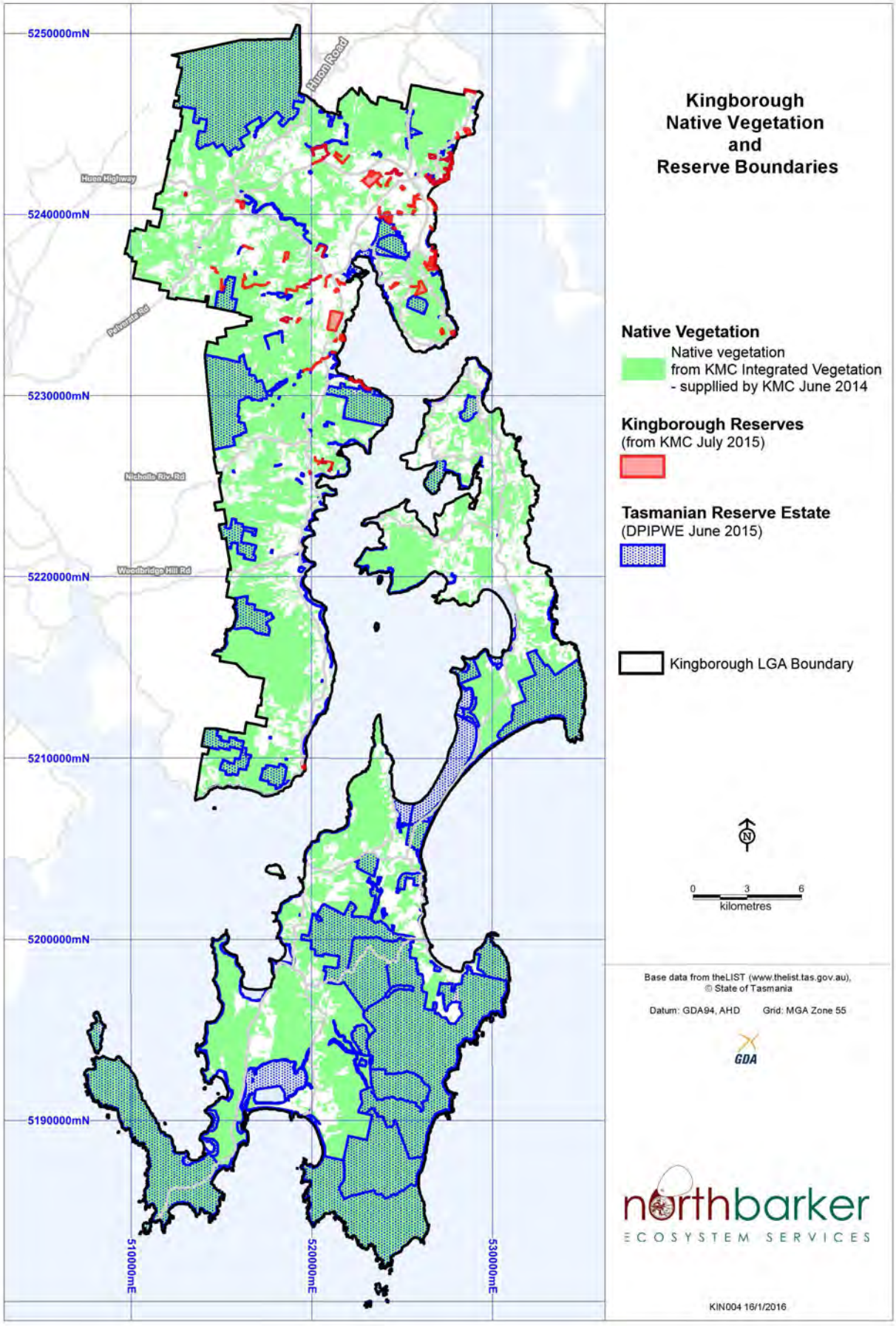


Figure 2 - Kingborough native vegetation and Reserve boundaries.

4 WEEDS OF THE KINGBOROUGH MUNICIPAL AREA

4.1 The Significance of Weeds in the Kingborough Municipal Area

The national weed strategy defines a weed as follows:

A weed is considered as a plant that requires some form of action to reduce what are perceived as harmful effects on the economy, the environment, human health and or amenity

Council has an obligation under the Tasmanian *Weed Management Act 1999* (WMA) to control declared weeds on land it has the title for or manages. Competing with this obligation is the threat posed by numerous other weeds that are not listed under State or Federal legislation. Often legislation is slower to evolve than local knowledge. Therefore, any weed strategy should prioritise weeds based on threat and in conjunction with legislation. Prioritising all known weeds will assist in identifying potential gaps, assist with future funding and aid in the understanding of where to focus time and resources going forward.

Kingborough contains a wide range of introduced plants. Just over 400 species are considered to be naturalised in the municipality (Appendix 3- Appendix 8 on pages 53-65)[3]. Some of these are well established and widespread. Others are fairly recent introductions, with small populations of limited threat to environmental, economic and/or social values.

Thirty-eight of the 115 declared weeds listed under the Tasmanian *Weed Management Act 1999* are naturalised within Kingborough, with 10 of these also Weeds of National Significance (WONS) – Appendix 3. Environmental weeds are also a significant threat to both ecological integrity and economic productivity in the Kingborough Municipality.

Ragwort, canary broom, English broom, boneseed, numerous thistles, pampas grass, gorse, blackberry, Spanish heath and African boxthorn are some of the weeds currently presenting significant problems in Kingborough. Along the coastal strips are pressures from weeds such as pines, boneseed and marram grass. There is also the threat of new weeds establishing in the region, as is particularly apparent in areas adjacent to other municipalities.

4.2 Prioritising Weeds for Control in Kingborough

Prioritisation method

Declared weeds

For the purposes of this Strategy, declared weeds and WONS known to occur within Kingborough have been allocated a priority rating from 1 (highest) to 4 (lowest), Table 3, Appendix 3 on page 55. The distribution of each declared weed is shown in Appendix 9 from page 75.

Environmental weeds

Non-declared environmental weeds that are included in the Strategy have mostly been rated as priority 5. These weeds are included in the additional Kingborough Local List (KLL), Appendix 4 on page 56, and discussed further below. A selection of these species have been elevated and ranked among the declared weeds to reflect the relatively higher importance placed on them by council. These are:

[3] Based on data collated from Kingborough Council, North Barker, and the Tasmanian Natural Values Atlas

PRIORITY 1

Isolated occurrences and/or highly invasive.

Billardiera heterophylla (bluebell creeper)

Ilex aquifolium (holly)

Kunzea ambigua (tick bush)

Kunzea ericoides (burgan)

PRIORITY 2

Widespread occurrence and/or moderately invasive.

Acacia retinodes (wirilda)

Passiflora tarminiana (banana passionfruit)

Pinus radiata (radiata pine)

Watsonia meriana var. *bulbillifera* (bulbil watsonia)

PRIORITY 3-4

Widespread occurrence, generally confined to disturbed habitats.

Rosa rubiginosa (briar rose)

Vinca major (blue periwinkle)

The Tasmanian WMA categorises declared weeds as Zone A or Zone B. In the WMA, Zone A denotes a weed that is not yet present in a municipal area, or is present to a limited extent, and for which eradication is the primary aim. Zone B species are those that are widespread in a municipality and for which control is the primary management objective. As this Strategy is considering weeds within a municipality (rather than between municipalities), the same concept is applied to variation within the WMA zone A and zone B classes - *i.e.* it is reasonable to suggest that some WMA Zone B actually occur at scale at which eradication may be achievable in particular places.

Other locally important weeds

Numerous species not declared under the TWMA present a serious threat to various assets in the Municipality. A number of these weeds are known to be invasive but are not currently on the other priority lists. These weeds should also be considered in any weed management strategy as per the draft Southern Tasmanian Weed Strategy 2011-2016. A list of all naturalised weed species is provided in Appendix 8 on page 65. An example of other locally important weeds within Kingborough is shown in Appendix 4 on page 56. This list should be refined further based on local knowledge and when completed and included within the interim Kingborough Planning Scheme 2014 definition of weeds. There are currently 68 species on this list.

Table 3 - Weed prioritisation and Action Plan targets

Priority Rating	Category	Action Target
1	Declared Zone A with localised infestations **20 species**	Coordinated rapid response for new infestations in consultation with DPIPWE Eradicate within 10 years
2	Declared Zone A with relatively widespread infestations. **8 species**	Eradicate or quarantine within term of the action plan (10 years)
3	Declared Zone B with localised infestations and elevated environmental weeds **4 species**	Eradicate isolated infestations, contain infestations to ensure no further spread within term of the action plan (10 years)
4	Declared Zone B with relatively widespread infestations **15 species**	Control and contain where threatening important values, aim to control spread from core infestations within term of the action plan (10 years) Considered response for all species Implement trial for incentives targeting eradication/control by landholders with properties > 2 ha
5	Kingborough Local List (KLL) – locally important weeds not declared or rated above **68 species**	Control and contain where in association with higher priorities or where practical through landowner partnerships/agreements. Target eradication of small infestations during term of the action plan (10 years)

Management Strategy for KLL:

1. Localised species of high threat that should be targeted for eradication.
2. Entrenched species requires a 'containment' style of management. In this scenario localised species should be controlled in order to protect identified assets from further infestations. Areas currently free of these weeds should also be kept free.
3. These weeds should be controlled at sites when in association with higher priority weeds.
4. A strategy for the replacement on invasive exotic plants should be developed.
5. Coastal weeds that should not be allowed to establish on beaches (and native coastal communities) that are currently un-infested or only contain light infestations.

The weed management priorities, including strategic site selection drivers are described in detail and presented spatially in Section 7, following the strategic framework.

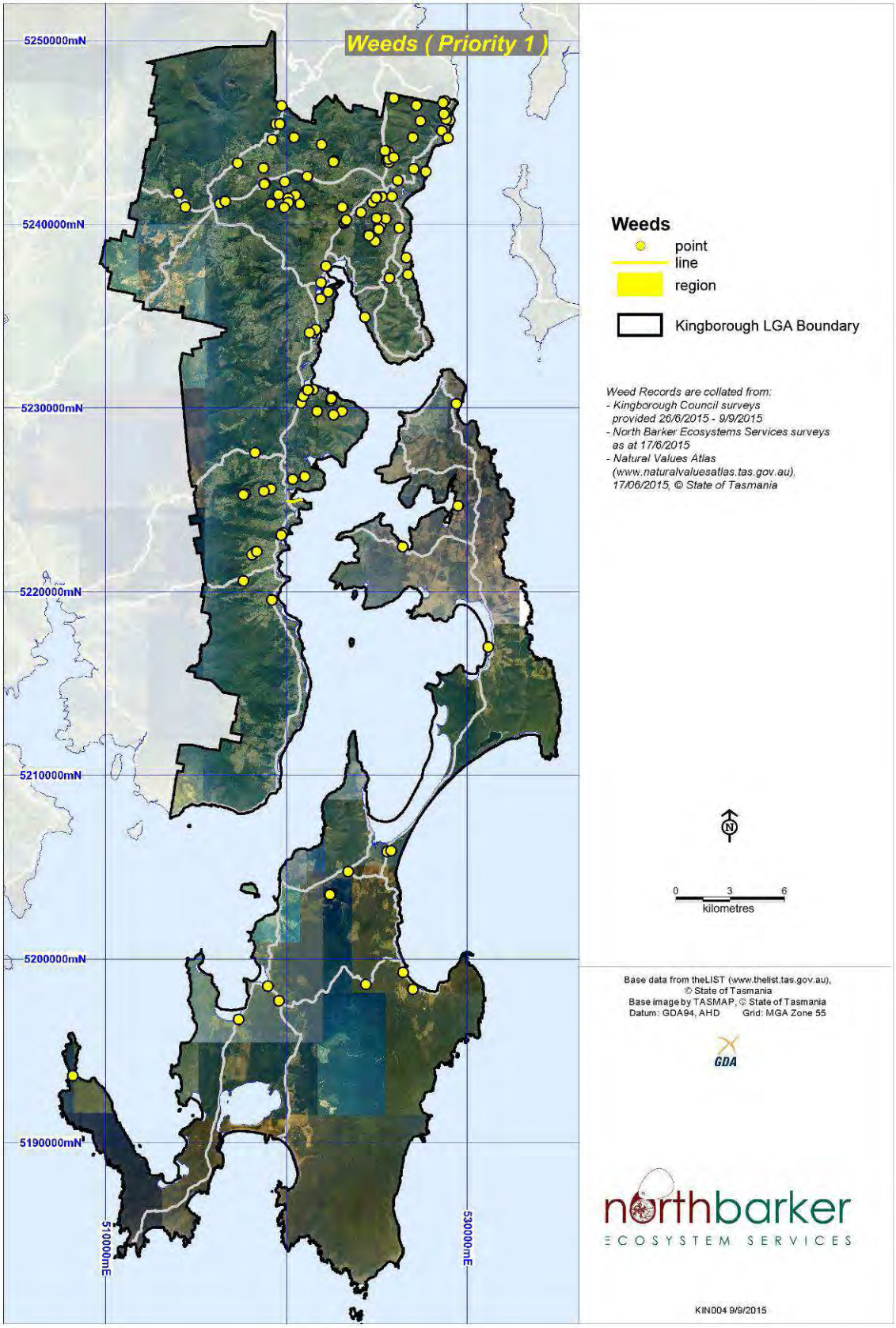


Figure 3 - Extent of priority 1 weeds

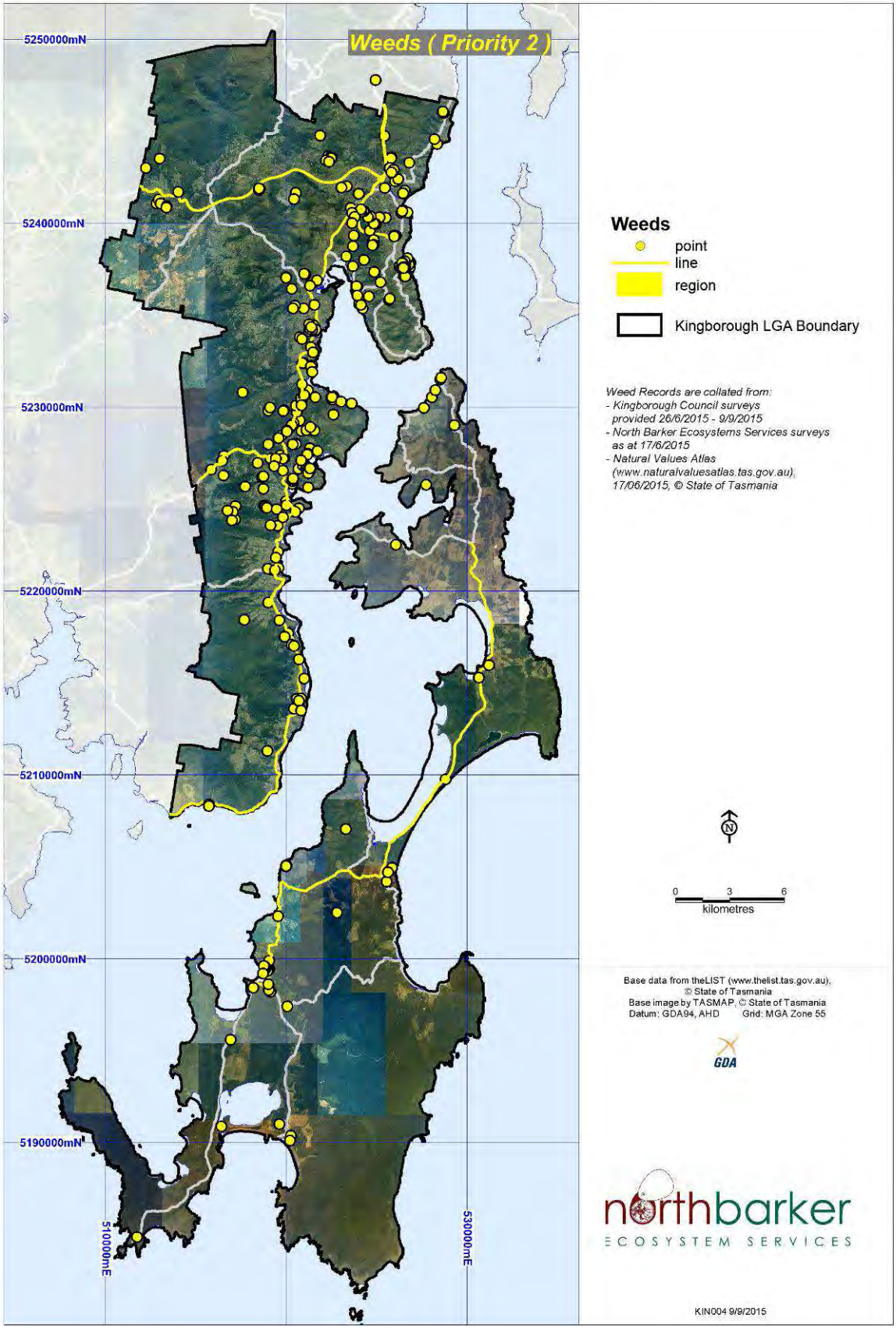


Figure 4 - Extent of priority 2 weeds

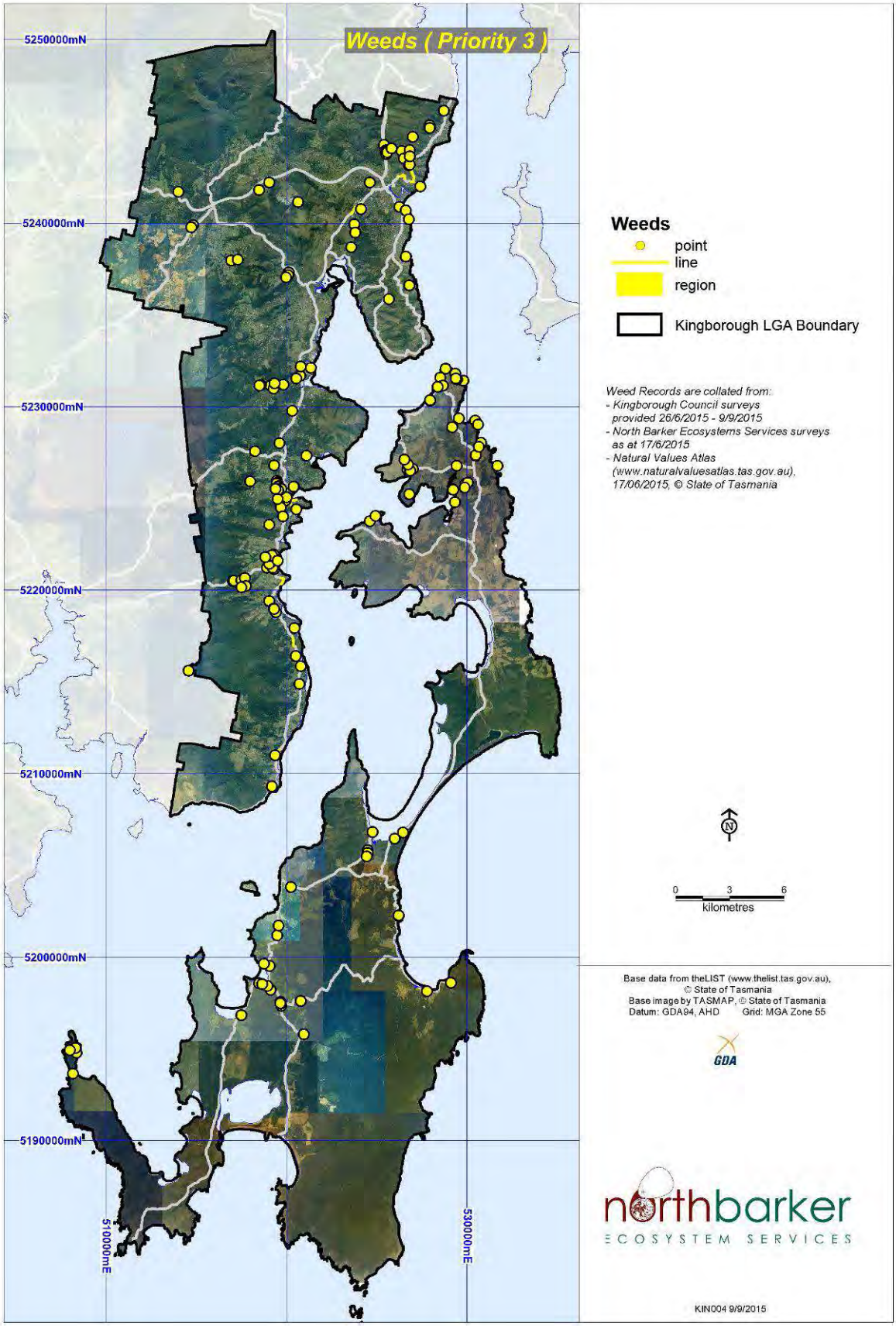


Figure 5 - Extent of priority 3 weeds

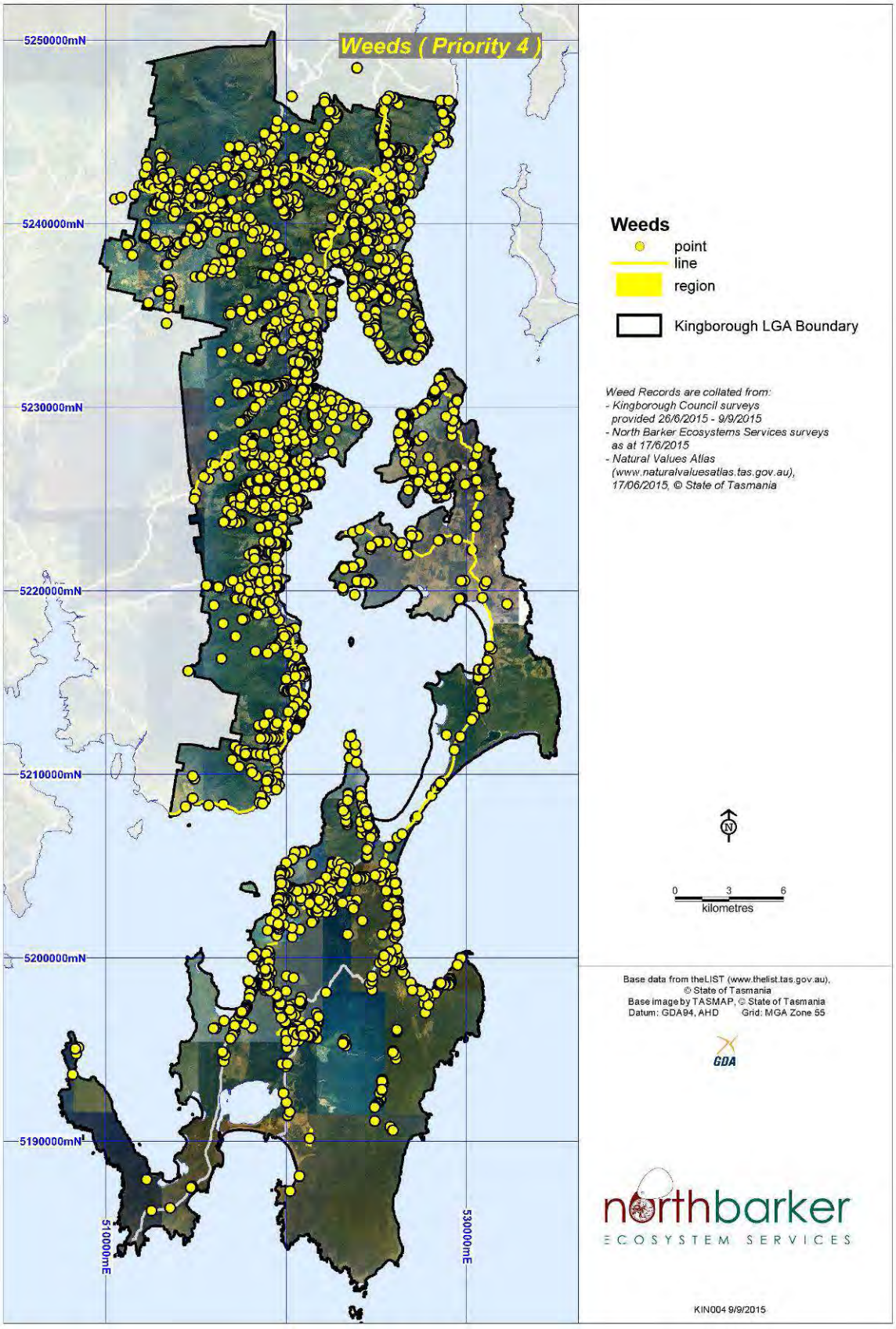


Figure 6 - Extent of priority 4 weeds

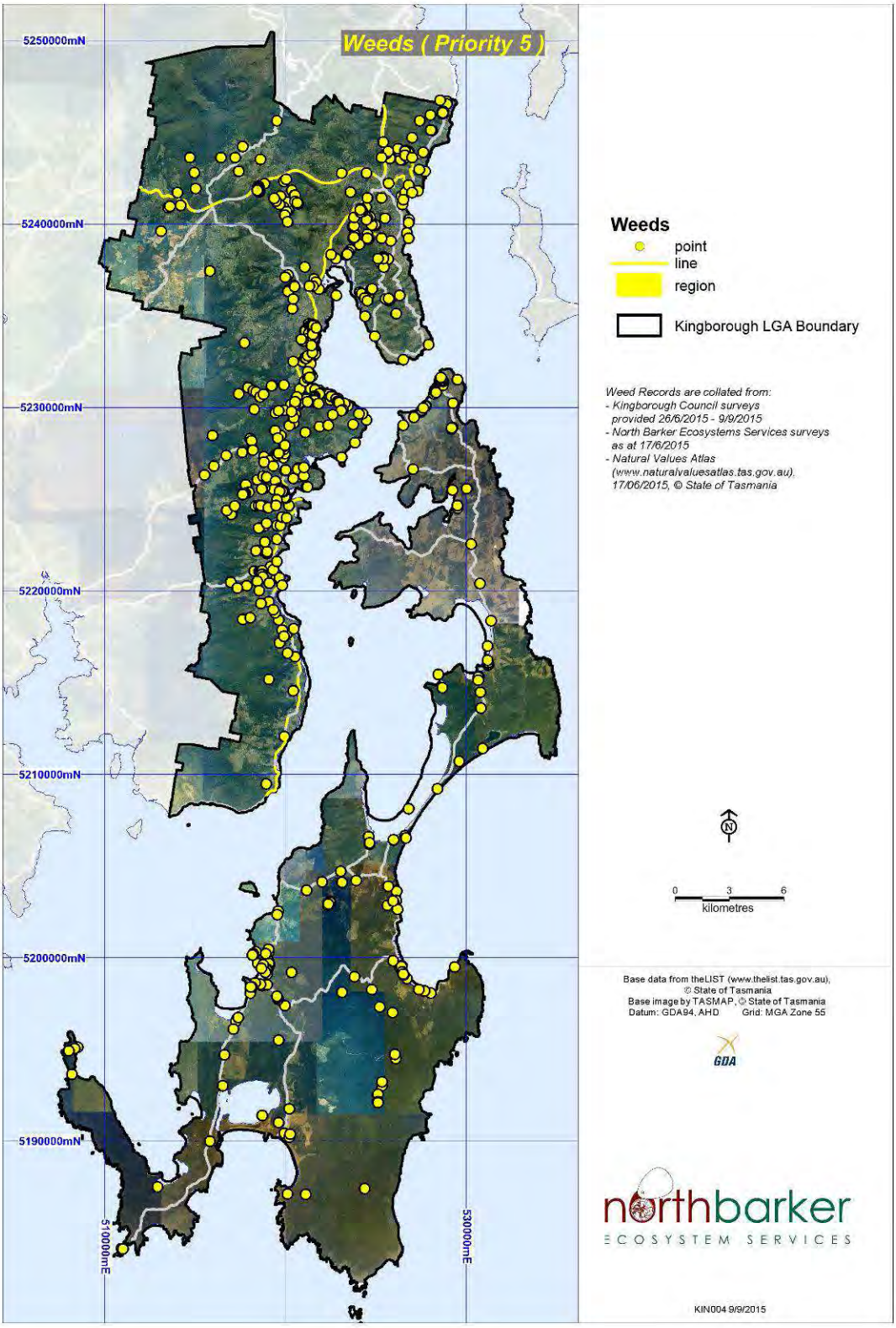


Figure 7 - Extent of priority 5 weeds

5 WEED MANAGEMENT STRATEGIC FRAMEWORK

The development and implementation of weed control strategies are generally based on a set of principles that flow from the national to municipal and that are outlined above in section 3.2. The following section outlines some key planks that are consistent with the overall principles of strategic weed management. The goal in implementing actions derived from these key planks is to optimise the level of integration of the interests and resources of the various stakeholders. This will provide cost effective and efficient weed management outcomes. The focus on these few key planks of weed management will return a high proportion of the efficiency and effectiveness gains to be had.

5.1 Plank 1 – Best Practice Management

The opportunity to embrace best practices with a view to greater efficiency and effectiveness of weed control is foremost when it comes to maximising cost effectiveness. Large gains in effectiveness and efficiency should first be sought in the application of proven best practices.

All improvements in efficiency and effectiveness translate directly into savings in time and money. Until an organisation can report that it applies best practice it is not in a space from which to make effective gains from innovation. Any innovation will be shackled by poor practices. In a sense, the application of best practice is in itself innovation for organisations that do not currently achieve it.

The list below includes a number of practices that are well recognised for increasing effectiveness in weed treatment.

1. A planned weed control program on an annual and seasonal basis;
2. Prevention and early intervention;
    - Including accurate and up to date weed mapping;
3. Up to date records of weed control;
    - Including date of treatment, treatment applied, weed(s) treated and area treated;
4. Eradication of isolated outliers, which arrests one of the primary mechanisms of weed expansion;
5. Identification and treatment of the source of reinvasion – looking beyond boundaries;
6. A commitment to secondary and tertiary treatment, including revegetation;
7. Improving hygiene - cleaning weed seeds from tools, equipment, machinery, vehicles, pets, clothing and boots contributes strongly to arresting weed spread;
8. Catchment management – top down approach in relation to water movement, which can facilitate dispersal of weeds;
9. Focussing on completing all stages of treatment (primary through to rehabilitation) of an achievable number of tasks;
10. A commitment to integrated weed management methods to reduce the control effort required – for example:
    - Revegetation;
    - Mix treatments to reduce risk of resistance;

- Minimise weed habitat or provide good access for management by utilising landscape design, for instance batters and roadsides that are easy to mow.

11. Minimising site disturbance;
12. Monitoring of primary treatments and prescribed responses to ensure appropriate and timely secondary treatment;
    - Including scouting to help to ensure new infestations are discovered early or to identify seasonal priorities.
13. Working efficiently: maximising team effort by organising labour tasks;
14. Optimising utilisation of equipment – consider sharing and hiring;
15. Utilising ChemCert trained staff and well-trained volunteers; and
16. Selecting, applying and storing chemicals appropriately and safely.

5.2 Plank 2 – Integrated Weed Management

Weed management comes with a risk of exposing the environment to contamination from chemicals contained within herbicides. Weed treatments are all too often locked into cyclical herbicide spraying programs because rehabilitation or site management is not considered as part of the solution.

Kingborough Council are committed to reducing the use of chemials. There will be a decreasing dependence over time as viable alternatives become available. The application of integrated weed management acknowledges that alternatives may be required but that in some instances herbicides are essential. This means that all risks associated with herbicide use must be managed appropriately and effectively.

KC's commitment to herbicide reduction will be evident in site plans whereby alternative methods must be considered.

The repeated use of the same chemical in association with the survival of some plants can lead to herbicide resistant populations. The application of a more diverse range of control techniques can reduce this risk.

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

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

1. Selective herbicide;
2. Biocontrol – species specific insect pests and plant diseases;
3. Mulch – effective in preventing germination;

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

Implications to Strategy

- Review current on-ground weed practices against best practices and ensure adequate skills and knowledge are present within all those implementing weed control/eradication programs.
- Ensure all Council weed control workers undertake appropriate ChemCert training and are proficient in the application of integrated weed management practices.
- Design a site treatment plan (STP) template which requires that relevant parties consider integrated weed management options.

5.3 Plank 3 – Planning

Strategic planning at the highest level provides guidance on the principles of weed management. Planning at the implementation scale provides for delivery of outcomes. Plans need to be pragmatic enough to allow flexibility and be able to accommodate management efforts that are responsive to changing Council priorities and community aspirations.

If planning is too tightly constrained by time or over-ambitious aspirations, then implementation is doomed to fail. Thus, the development and implementation of plans needs to be well considered to accommodate flexibility but also clearly direct works in line with strategic priorities and best practice methods. Monitoring should be included in plans to gauge effectiveness and adherence to plans. In these ways implementation plans become a valuable resource and performance management tool.

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

5.4 Plank 4 – Risk Management

Prevention and early detection

Prevention, early detection/eradication and control or containment are the ultimate risk management objectives. The effective mitigation of risks provides an opportunity to protect important places from weed invasion or spread and minimise the resources needed for weed management. The eradication of weeds from sites detected early is generally more likely to be achievable. However, a challenge for early detection is the ability to identify new weeds that managers are not familiar with.

In this context examples of risk management may include the routine monitoring of Council reserves and other assets, as well as selected places at risk of incursions, to ensure that the weed flora is understood and is appropriately prioritised and treated in the works plans.

Unmonitored environments where weeds are thought to be absent can develop into significant sources of propagule pressure, with subsequent demands on resources. The obvious advantage of an investment in monitoring weed free areas is the opportunity for early detection and efficient low cost weed control or eradication.

Early detection is required for new invasions to Kingborough and for new locations of priority weeds. Those posing the greatest risk are weeds known to be highly invasive elsewhere. However, the circumstances into which a weed invades can be a major determinant of its rate of establishment.

Kingborough contains significant areas of bushland in which future development may occur. With more people attracted to a periurban lifestyle comes the increased risk of weed colonisation associated with cleared bushland. Clearing provides conditions suitable for the introduction and spread of weeds into areas previously free of infestations.

The opportunity here is to ensure pre-emptive risk management.

Future development application approvals should provide more stringent consideration to the implications of the spread of weeds in areas within or adjacent to native vegetation. The approval to build within these areas should include a stringent assessment and planned response that minimises the threat of weeds. The benefits gained by including existing weed control and future management at this early stage significantly reduce the potential costs of weed management that is otherwise only begun once an infestation becomes apparent. Compliance checks and enforcement of permit conditions would also enhance outcomes.

Weed risk assessments

Weed risk assessments include consideration of a large range of attributes of a weed species that relate to biogeography, biology and ecology. Weed species listed under the Tasmanian WMA have undergone a weed risk assessment prior to their declaration.

The risk assessments ultimately attribute a weed with a score. A low score indicates species that pose a low risk, but if the score exceeds a particular threshold it would be rejected from importation if they were not already in Tasmania, or may require further assessment to determine if they could be imported. The weed risk assessments for declared weeds indicate the weeds with the highest potential to invade and spread. The result of the scoring system has been used to assist with prioritising weed driven selections.

Implications to Strategy

- Require funded weed control plans that minimise the risks posed by development within area of high conservation value and environmental importance.

5.5 Plank 5 – Stakeholder Engagement and Partnerships

The summarised tenure break down in Table 2 (on page 5) reflects some of the major stakeholders in the municipality. These five entities manage more than 97 % of

Kingborough. The relative values demonstrate the small area that Council directly controls with regard to weed management.

Urban density is greatest in the north-eastern part of the municipality in close proximity to the main transport corridor. Extensive areas of bushland interface with private landholdings throughout every township of the KMA.

Current distributions suggest weed issues are generated in populated areas and spread linearly along creek systems and roads, with spot invasions ahead of fronts also resulting from animal and wind dispersal. New weed populations then establish wherever suitable conditions exist, regardless of tenure. Some invasive weed species will even establish in undisturbed bush. Public Open Spaces and footpath verges can also become points of weed infestations if not well managed. Roadside weed management is a particular concern for Council, because of the varied tenures and highly suitable conditions for weed transport and establishment.

What this means is, weed dispersal vectors and propensity to establish are factors independent of tenure boundaries. In order to provide cost effective weed management that meets landowner expectations, programs need to be integrated across all tenures, private and public. This can also be effective in minimising reinfestation and thus reducing management requirements in the long term.

Agency engagement

Strong outcomes rely on good stakeholder relationships, good work practices and collaborative weed programs with the respective landowners and agencies. Cooperation is required and there are opportunities to grow mutually beneficial relationships.

For instance, among the various State Departments that manage land within KMA, the Department of State Growth should be supported and encouraged to control weeds on State roads. The Parks and Wildlife Service (PWS) should be encouraged to manage relevant reserves. In each case the Council could seek input into the nature and precise locations of activities.

It is acknowledged that all agencies face constraints from their financial budgets. Improved financial outcomes can be gained through cooperative service agreements between stakeholders and mandatory monitoring and secondary treatments (thus reducing future costs through more sustained control).

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

Implications to Strategy

- The Council is to foster cooperative projects with various landowners and agencies, in which costs are shared.
- Funded service agreements with State agencies provide an instrument to achieve cross-ownership outcomes.

Community engagement and partnerships

On ground weed work is resource demanding. Successful weed management requires a long term commitment. Outcomes would be greatly enhanced by fostering community support and building upon relationships and networks.

Kingborough Council has a large number of volunteer Landcare and Coastcare groups that operate predominantly on Council and other Crown land, but focus at times on other land tenure throughout the municipality. These groups vary in skill levels and

numbers, and a groups longevity is contingent on the passion, skills and ages of those involved among other critical factors. It remains critical that Council supports them and nurtures the relationships. Due to the regular changes in the groups contributing, a list has not been included here.

With a strong involvement from Landcare groups, and the continued guidance from the Weed Officer, groups can continue to effectively communicate with Council and are adequately resourced. Landcare groups often struggle long term in continuing to hold adequate level of volunteer help, and Council can assist with administration and communications to help Landcare groups achieve the required support.

Collaboration between Council and community groups presents the best opportunity to maximise external funding opportunities. There is no better way of demonstrating Council's commitment to increasing community participation than by providing incentives and rewards to rate payers willing to participate. As Council has limited resources for weed management across the municipality, it is important that future efforts are focused on developing new and expanding upon current collaborations across all land tenures (especially private lands as they make up a large proportion of land ownership). Novel ideas need to be investigated and a number are proposed in the Action Plan.

To encourage all stakeholders to take weed management seriously it is essential that Council and key stakeholder agencies lead by example. Weed infestations on public land includes some of the more visible examples. Likewise, these sites provide opportunities to demonstrate how well coordinated weed management can be successful. There is no better way of encouraging a landowner to become involved than by demonstrating how the issue is taken seriously by Council and government agencies. Landowners may become frustrated and disheartened if they perceive "government" is not doing their bit. That means roadsides, public parks and reserves should be targeted as absolute priorities.

Implications to Strategy

- Weed Officer should provide continued support to volunteers such as Landcare Groups.
- Weed Officer continues to facilitate access to advice and specialist knowledge, and inform volunteer groups of available funding.
- Develop a cost effective system of partnership agreements with volunteer groups and with important land stakeholders.
    - Rate reduction incentives should be included to entice participation of private landholders.
    - Continue the promotion of land stewardship, including rates remission for managing covenants.
    - Trial a market-based instrument known as a reverse auction.

5.6 Plank 6 – Education and Training

Education

Community engagement provides an opportunity to educate interested groups and ratepayers generally. This potential for positive engagement is a much under-valued resource.

Community education can make an important contribution to the weed control effort. Much can be gained by awareness and an understanding of what is at risk, where it is at risk and why it is at risk. If the ultimate aim of education is an understanding of the local weed management issues and efforts toward solutions, then more people are more likely to participate in the efforts toward the solution. Even if their participation is indirect, *i.e.* they no longer contribute to the problem. In this context, the spread of understanding, through education, will produce better weed management outcomes than facts and information alone.

Training

Staff, contractors and volunteers who regularly undertake work relating to weeds, including earth and plant movement, need to be regularly engaged in training that is specific to the delivery of the municipal weed management strategy.

Over time staff, contractor and voluntary positions have changes in personnel. Over time procedures, regulations and techniques are updated. Thus, periodic training is required to keep up to date with best practices. Where relevant, training should include ChemCert, equipment use, hygiene principles and practicalities, weed identification, and control techniques.

5.7 Plank 7 – Monitoring and Review

What does success look like? This is a question that must be asked when the answer is unlikely to be immediately obvious. Very few areas are unlikely to remain entirely free of weeds for perpetuity. Thus it is through consideration of composition, distribution and abundance, in relation to the resources applied, that we can judge success.

Recording and data-basing of weed management efforts and results is an opportunity that should not be lost. As time progresses, the gathering of baseline information and subsequent responses to primary and secondary treatments will develop into a valuable record and planning resource. From baseline data a manager can undertake measurements, set targets and generate performance indicators. Once there is sufficient data to detect change due to management effort, then success can be measured.

Whether a site has previously been treated or not, it is never too late to collect a baseline dataset. These records are an essential reference from which to measure the effectiveness of efforts and plan follow up treatments, including alternative approaches should a treatment prove ineffective.

A database could be designed with failsafe controls that ensure no new record can be entered until the previous one is completed.

Further detail on monitoring and review is provided in the Action Plan.

The effectiveness of the management plan is dependent on the ability to implement, monitor, respond to information gained, review and update. There is an inherent risk with all strategic planning that relevance and impetus fades with time. Monitoring and evaluation must be incorporated to ensure review and adjustment where necessary. New ideas may originate, current ideas may prove unrealistic. These are normal barriers to success and the ability to respond to these challenges is also important.

Performance indicators are useful measures of progress and compliance with plans. Ideally some level of quantitative or measureable performance is required to track progress and identify strengths and weaknesses. Care should be taken to design PI's that are meaningful and unlikely to result in perverse outcomes.

Thoughtful PI's include leverage. For example, if a weed plan for a site is implemented completely (baseline collected, primary and secondary treatments undertaken, and monitoring completed), the PI is multiplied to return a maximum score. On the other hand, if a greater number of sites have had primary treatment at the expense of secondary treatment, *etc.*, then only the primary treatment is scored and so the multiplier is not applied as a reward. This will encourage managers to stick to the plan. Of course the implementation of the PI process must be part of the process.

A five yearly review is sufficient for PI's such as described to be meaningful.

While some changes or updates will be routinely required to accommodate regulatory changes and the like, other changes should be based on data and respond to the performance measures recommended above.

Implications to Strategy

- Implement a live tablet based GIS database for all weed management activities occurring in the KMA.

6 ACTION PLAN

This plan identifies actions that take advantages of the opportunities described under the planks in section 5. Each action aims to steer future weed management within the municipality towards efficient and effective weed management. The Action Plan is outlined in Appendix 10.

The present Action Plan takes into account the progress relating to the Bruny Island and Channel Weed Management Strategies. A number of incomplete actions in those strategies, or actions requiring continuation, will be carried forward and progress has been reviewed in Stage 1 of the development of the current Strategy. However, this Action Plan focusses on actions directly related to the 7 planks of the strategic framework. This focus will return a high proportion of the efficiency and effectiveness gains to be had (referred to as EEG).

6.1 Best Practice Management

The concept of best practice and the practices themselves are required to be adopted within each of the planks of the strategic framework described above.

High level strategies, action plans and site works plans can only succeed if the foundations on which they are built and operate are consistent and sound. This consistency is all too often not evident. An appraisal of all aspects of weed management planning and control at Kingborough Council is needed to determine how the current weed management effort compares to the major planks of the strategic framework. Once this is understood, adjustments can be consistent with the planks and align them with best practice.

Action:

A review of the Kingborough weed management operation is required. This would include but not necessarily be limited to, chemical use and storage, safety, equipment used, training of staff, information gaps, and contract content. The operational organisation should be included in the review.

The review should include interviews and field assessments to identify areas in which significant improvements can be made toward efficient and effective weed management. All improvements should align with best practice procedures.

All Council staff should have ChemCert Accreditation (AQF2 or equivalent) prior to undertaking weed work and where necessary this training should be kept up-to-date. Weed management planning should be undertaken by someone with ChemCert Supervisors Accreditation (AQF3&4) or equivalent)[4]

EEG: Best practices reduce wasted effort and resources and maximise effectiveness and safety from planning to implementation.

6.2 Integrated Weed Management

The principals of integrated weed management should be adopted and evident in the range of techniques applied in specific site treatment plans, as well as more generally.

[4] http://www.chemcert.org.au/

The various options for treatments at a site should reflect site opportunities and constraints. For example, access limitations and vulnerabilities, such as erosion potential and habitat sensitivity, including waterways (see section 7.3 and 7.4).

Other than where a continuous program is necessary, an integrated treatment plan should conclude with rehabilitation.

Action: Ensure that all staff understand the concept and are committed to the application of integrated weed management techniques.

Action: A template for site treatment plans should be developed (see section 6.3). The template should include the range of weed management treatments that can be integrated to meet the stated aim of the site treatment plan.

Ensure that treatment plans that reflect the application of integrated weed management score highly in the performance review.

EEG: Integrated weed management techniques reduce chemical use and ultimately reduce the time and cost required maintaining a site weed free or under control.

6.3 Planning

Information management

The electronic management of information is essential in a modern data and project management environment. In the context of weed management, all elements of the works and site plans should by stored as fields in a GIS database. The planning and treatment processes or protocols must be inextricably linked to the data tables. This ensures that there is consistency between planning and treatments, and that all data is able to be illustrated on a map.

A GIS interface that can be used on tablets in the field can ensure that the data can be downloaded and uploaded via the GIS table. 'Exponare' is such a system that could be adopted for use. Less complex systems are also available.

Action 1: Develop and utilise a live electronic information management system based on Exponare or equivalent program.

Prioritising tasks

The analysis of weed and site priorities has been described above. In terms of the selection of sites for work schedules, this does not need to be driven 100 % by the prioritisation list, but should be informed by it to the extent that intuitive selections optimise the selection by balancing with other demands.

Works plan

Weed management planning requires an overarching works plan and schedule, as well as individual site treatment plans that flow from the works plan.

The works plan should include and identify the sites selected to be treated when prioritising tasks. The schedule must take account of the seasonal vulnerability of priority weeds. A weed treatment calendar will inform the schedule. The schedule will then be an important factor in the optimisation of the selection of sites to be treated.

Action 2: Develop a works plan for 12 months in advance. The plan should be based on an optimisation of sites determined from weed, site and community led priorities. Appendix 11 summarises the recommended contents of a work plan

Site treatment plan

Site treatment plan templates must at a minimum include all of the National attributes required for weed mapping.

Action 3: Develop site treatment plans. Appendix 11 summarises the recommended contents site treatment plans.

EEG: Planning is the basis for integration of strategic and implementation aims. Efficiency and effectiveness is enhanced by connecting the aims of strategic planks to site treatment.

6.4 Risk Management

Prevention

There are many small and potentially useful actions that can be recommended to reduce the risk of new weed incursions. Most have been recommended in most weed management strategies.

Action 1: Highlight the list of all Zone A weeds in Tasmania that are not known from Kingborough (Appendix 5). Ensure weed management staff can access assistance to identify each of the species.

Action 2:

Ensure that all nurseries are aware of the DPIPWE weed risk assessment aims and methods. This information is available at:

http://dpipwe.tas.gov.au/invasive-species/weeds/environmental-weeds/weed-risk-assessment-scoresheets-reports

This Action should be supported by lobbying State Government to provide stronger regulation on weed risk management for commercial nurseries.

Early detection

Early detection is required for new invasions to Kingborough and for new locations of other priority weeds. Those posing the greatest risk are weeds known to be highly invasive elsewhere. However, the circumstances into which a weed invades can be a major determinant of its rate of establishment. In other words, eliminating suitable habitats can be an additional pre-emptive measure.

1. Develop a weed alert network (made up of stakeholders) that assists the Council in sourcing weed information that will aid in verifying new weeds and provide more eyes on the ground.
2. Have a quick priority response procedure for when new weeds are identified.
3. Ensure no declared/WONS weeds are for sale in the municipality through inspections of nurseries and community markets.
4. Ensure that one focus of scouting and monitoring includes high risk vectors such as roads and fence lines.

5. Ensure effective hygiene procedures are in place for Council operations and as part of the approval process for developments.

Action 3: Send out a weed scout to rapidly monitor some (different) high value assets each year, as well as some weed free areas, so control can be implemented in a timely fashion in the current seasons works plan, should it be required. Allow for this responsive management in the works plan schedule.

EEG: The prevention of expansion of sites due to early detection and control, reduces future demands for resources thus putting downward pressure on the weed management budget.

Early control of new infestations is a major gain in the long term demand on resources and reduces the risk to high value assets.

Containment

Containment is a reasonable aim for many widespread species. As implied by the name of the action, containment is appropriate for core weed sites that cannot be eradicated in the current strategy and are not managed under a maintenance program. Some containment sites may be quite stable in size but remain sources of propagules that disperse to other locations. The rate of spread is controlled by eradicating satellite sites as they establish, and thus preventing them becoming a source of propagules for further dispersal from the core. This should be prioritised based on nearby sites of value.

To select areas for containment ideally requires knowledge of the level of infestations of all sites and an understanding of the vectors. This requires reliable knowledge of at least distribution. Those sites judged to be expanding or sources for propagules, but too large to eradicate, should be identified. Some such sites may be expanding linearly along roads, others radially from the core. In either case there will typically be a pattern of satellites emanating from the core. The satellites should be the first treated in the containment effort.

Action

a) Implement a strategic approach to the containment of sites infested by widespread weeds. This should focus on control of widespread weeds near assets, and/or places that are satellites of the core containment area.

b) Maintain an up-to-date weed and weed management database, as described above. In time this will provide the data to support site selections for the management of cores and satellites.

c) Ensure implementation of best practice hygiene management practices for staff and contractors, particularly when working in containment areas.

6.5 Stakeholder Engagement and Partnerships

Australia is lowly ranked against other advanced economies for the level of implementation of innovation. One reason that is thought to contribute to this is the high level of competition that generally exists in our society. Competition drives the creation of innovative ideas by individuals, but implementation of innovative ideas is more successful when developed and implemented by teams. Team members buy into and own the innovation.

Strong stakeholder and community partnerships are valuable assets when seeking to develop and implement cooperative and innovative efforts. In this case, a strong

motivation for innovation is to deliver more efficient and effective weed management for all interests.

While the following actions have been recommended, and have proven to be effective, further development should be undertaken by cooperative team efforts with stakeholder agencies and community partners.

Action 1. Rates and levies

Financial incentives, such as rate rebates for weed management require financial offsets elsewhere in the Council budget.

Rebates

Rebates should be targeted according to levels of infestation and proximity to assets. Landowners should be required to use the money saved to contribute to the control of weeds. Engagement of weed control contractors at this scale can be cost effective.

Levies

Levies collect additional financial resources that can allow the weed management effort to achieve more in the same time. Levies are a broader based source of revenue that can be applied to targets or broadly utilised.

A levy to collect revenue for weed management can be dedicated in the Council's budget and applied directly without detracting from other demands on the budget. Levies can be collected from any of a number of sources from which Council already gather revenue. For example as an addition to waste management charges added to rates or collected at the tip. This could be identified separately on the rates bill, or as portion of charges such as development application fees. The broader the base, the fairer the levy given that everyone benefits, either directly or indirectly from weed management. For example, even a person who tolerates the visual impact of weeds benefits from the effect of reduced costs on agriculture through lower food prices.

An existing levy that is collected at the Barretta tip is a good example of an existing environmental levy. The levy is used to rehabilitate the former landfill site and to contribute to the upgrading of a waste transfer station. The long term imposition of this levy has resulted in a level of acceptance by ratepayers. The redirection of the funds from this levy to other environmental works may therefore not meet with resistance in the way a new or additional levy might.

EEG: Rate rebates encourage landowners to control weeds on their land. It is an effective way of achieving gains on private land that may otherwise not be managed.

Action 2. Reverse auction

Motivated people using best practice methods are the most effective weed managers. Innovative approaches that engage the community must motivate the community. An innovative mechanism that only engages motivated people and seeks to leverage the work that they complete is the reverse auction. In a reverse auction, people, businesses or care groups propose a project that meets a set of criteria set by the auctioneer (Council) and indicate a price at which they are prepared to complete the project.

While any project that meets the criteria should be acceptable Council could also identify target areas and invite community based applications to complete the weed control task. The most cost effective proposals would be funded.

The basic criteria should include:

- Priority locations
- Priority weeds
- Best practice methods
- A price for primary treatment
- A price for secondary treatment at 12 and 24 months.
- Rehabilitation

Action 3. Cooperative Weed Management Areas (CWMA)

Large scale management of weeds that occur across tenures and property ownership boundaries are fraught with practical difficulties. Without sustained coordination of effort, the outcomes may be poor. Effectively the weeds are dividing and ruling the land managers.

As weed dispersal is not restricted by tenure, where an important weed infestation is recognised that crosses boundaries, cooperation between owners is essential.

CWMA's have been implemented in the USA where members have a shared focus, generally agriculture. However, the shared focus can just as easily be, for example, cost effectiveness, nature conservation, or maintenance of visual amenity.

The basis for management of CWMA's is typically contractual agreements. In Kingborough these could be Service Agreements or Memorandums of Understanding (MOU's) that articulate a common goal, set of protocols, and actions agreed between participants.

The content of an agreement should reflect the level of an organisation's or landowner's capacity so that it is achievable. The level of binding obviously needs to reflect an organisation's or landowner's preparedness to commit. Nevertheless, some success with a low level of commitment may well lead to greater future commitment. From little things big things grow.

The partners for the initial CWMA's should be carefully chosen from motivated organisations or landowner's so that success is likely. Opportunities exist for cooperative weed management efforts between Council and State roads, PWS, Tas. Networks and Tas. Water. In addition, an opportunity exists for a cooperative weed management effort between Council and landowners that have road frontage.

EEG: Effective management of weed infestations, that cross tenure boundaries, dramatically reduces the rate of reinfestation and thus the requirement for repeated control by each partner.

Action 4. Coordinated Weed Management (CWM)

Weed management efforts can be coordinated with very little cooperation from a partner. In the annual planning framework Council should liaise with other organisations to find out where they intend to control weeds. With this knowledge, Council can plan to control adjacent or continuous weed infestations that cross tenure boundaries onto Council managed land.

Council should coordinate through advertising indiviuals, groups and organisations to tackle a particular weed at a time that takes into consideration best time to treat the weed and transporting weed seed etc.

EEG: Whether cooperative or coordinated, these approaches provide effective management of weed infestations that cross tenure boundaries. The combined efforts dramatically reduce the rate of reinfestation and thus the requirement for repeated control by each partner.

Action 5. Service Agreements

Cooperative or coordinated efforts may not be effective if the potential partner isn't strategically managing weeds. In such cases a Service Agreement with the partner may be more effective. A Service Agreement involves the partner paying the Council for the weeding service. This is particularly applicable where a partner's weed issues are strategically important in the Kingborough strategy. Examples include, where a particular road, easement or utility presents a particular risk of infestation or spread to a priority site.

The terms of the Service Agreement would have to be attractive to the partner but also allow Council to leverage the outcome by gaining more effective control of the weed management strategy at the site.

EEG. Control over the weed management effort allows the effort to be integrated into the Council priorities and planning processes. The effort will be more effective and ultimately more cost efficient as control is gained.

Action 6. Replacement plant policy

The rehabilitation of weeded sites is an essential element of improving the effectiveness of weeding efforts. The purpose being the elimination of space for the weeds to establish.

Where persons or care groups have completed primary weeding projects, Council should continue making available plants to replace the weeds. This is an excellent way to leverage the weeding effort by progressing toward effective control or eradication of weeds from the site.

The Action should include the provision of plants to rate payers or groups known to be undertaking primary weeding projects.

EEG: An important component of integrated weed management that will reduce the risk of reinfestation and cost effectively reward the weed manager.

6.6 Education and Training

Education

Maximising participation with stakeholders and the local community requires an increased understanding of the threats and other issues posed by weeds, as well as the range of potential solutions and the Councils strategic approach. To facilitate this increased understanding, the Council must engage with stakeholders and the community. The range of communication and education strategies available today is dramatically different to a decade or more ago and Council should adjust to this change.

Prepare a modern Weed Communications Strategy. The strategy should effectively disseminate information to renew interest and increase understanding of the weed management "challenge". It must clearly communicate the Councils role and the

essential need for community participation. The planks of the Weed Management Strategy should be re interpreted and reinforced through the Communications Strategy.

However, the Communications Strategy should be extended to utilise modern media tools like Instagram, blogs or Facebook, to launch the whole of the weed information, education and discussion into cyber space.

Introduce a separate webpage to the Council website that is kept up-to-date and holds all the relevant weed information relevant to Kingborough. This should be linked to other agencies and act as a central page linking to the other communication tools such as Facebook/Instagram with an ongoing regularly updated blog.

A forum should form part of this website to encourage interaction and dispersal of information. This is also a good learning tool for others who may simply read the forums and not contribute, or just ask questions.

The Communications Strategy should also continue to provide hard copy written and pictorial information and guides, including a regular feature on weeds in a local paper and newsletters.

Training

Ensure Council weed managers are ChemCert trained and volunteers are adequately trained for techniques approved in the field, such as cut and paste.

All staff, contractors and volunteers regularly involved in weed management should be trained to identify weeds, particularly the lesser known species. All staff, contractors and volunteers regularly involved in weed management should be trained to understand the principles and practices of weed hygiene and weed treatment.

EEG: A practitioner who understands a task, the risks and the mitigation will be much more effective than one who does not. Regular education and training counters the attrition of knowledge and skills over time.

6.7 Monitoring and Review

There is an inherent risk with all strategic and implementation plans that relevance and impetus fades with time. Monitoring and review must be incorporated to ensure evidence based adjustment and that the measurement of success is part of the weed management culture.

Strategic review

1. Reconsider the relevance of the strategic framework after 5 years.
    - Are the major planks the most likely to return cost effective improvements in efficiency and effectiveness of weed management? Adjust as necessary.
2. Review progress against each of the strategic planks and refocus or redefine actions that have not progressed.

Site monitoring

The effectiveness of a management plan cannot be known without a monitoring program. Monitoring programs start with planning and data collection but do not end

with a revisit or with re-measurement. Monitoring includes ensuring the previous task is complete, determining the effectiveness of treatment and adjusting as necessary. Adjustment includes a scheduled response to findings in the works and site treatment plans.

The monitoring program should include a measure of resources used for each treatment (person hrs per unit of time). Cost is a strong standardised measure per unit area. The effectiveness of a management plan can then be judged by the cost required to achieve the management aim.

1. Construct a performance indicator (PI) based on the cost of improvement evident in data. This PI requires the area treated, abundance and person hrs. This gives a rate of treatment per hr. The impetus is toward having the rate decline overtime because at least one of the inputs has declined.
2. Aggregate the site plan PI's for an overall PI for the works plan.

Audit and efficacy

1. Audit the adherence to and effectiveness of the planning and site treatment plans.
    - If adherence and or effectiveness is less than expected (PI static or falling), question why and adjust.

EEG: Efficiency and effectiveness can only be judged and measured on evidence gained from consistently recorded data.

7 WEED MANAGEMENT PRIORITIES

There are always alternative ways of prioritising weed management. For example, there is debate about the options of treating all weeds within a specific site or concentrating on treating priority weeds on all land on which they are found. Weeds can also be prioritised based on invasiveness or by adopting higher level systems, such as those of the Tasmanian Weed Management Act 1999. Each approach has merit from the perspectives of conservation and effectiveness. However, it is also inevitable that additional choices need to be made in the context of practicality and competing demands, including community driven priorities such as areas under the stewardship of care groups. Reactive management actions in response to public concern also need to be resourced.

The context of weed management in the KMA is complicated by a diverse range of these competing elements. They include the priority of weeds, the importance of particular sites and the various motivations to control weeds, such as visual amenity, conservation of threatened species and threatened vegetation types. There are a myriad of potential solutions that largely rely on prioritising and ranking. Normally there is no single solution that will satisfy all interests, but rather alternative solutions that involve different balances of the various interests. We must, therefore, try to optimise the solution.

In most situations where values interact it isn't possible to optimise all the objectives at the same time and so compromise solutions or trade-offs are required[5]. Where resources are not unlimited it is not possible to implement a fully optimised solution. There are also unpredictable social and political interventions that require reactive responses and so a need for a compromise solution. Compromise solutions can't do better for one objective without worsening the outcome for another of equal importance.

A severe limitation of the quality of optimisation is the quality of data. For example where the selection of a site is context dependant, threatened species population size, weed infestation size etc. the data may not be of equal quality across all sites.

It is also difficult to specify preferences or weighting where objectives are incomparable. For example, the maintenance of visual amenity versus the protection of native habitat or maintaining storm waterways. Biases can be applied and may be based, for example, on sources of weed management funding.

So, a certain level of reordering of priorities is required to balance the selection of sites for management and hence help to satisfy all interests.

Ultimately, this process will require KC weed managers to select sites to fill annual works plans that also accommodate operational limitations, such as access, and budget constraints.

7.1 Strategic Priorities

In this strategy four priority drivers are used to select sites.

1. Weeds
2. Community (reserves)
3. Threatened flora habitat
4. Vegetation

Each driver was itself prioritised based on the following rationale.

[5] Lucas, C. Practical Objective Optimisation

Threatened fauna have been included in the management zones to be taken into account by management prescription. While there are some exceptions, the rationale is that many animals range across significant areas and so NVA point observation records are not useful. Where animals are dependent upon particular vegetation types, those types are included in the management zones.

Figure 9 illustrates weed driven priorities and Figure 10 community driven reserve priorities.

Weed priorities

See Section 4.2 for the rationale for this prioritisation.

Community reserve priorities.

KC ranked reserves based on a number of condition criteria and the level of community interest (Table 4). The strategic prioritisation is a reclassification of the community engagement rank.

Table 4. Reserve prioritisation based on the level of community participation.

Strategic Priority	***Rationale***	***Community Concern (KC)***	***Community Interest Key (KE)***
1	Active Community Group	1	Active Community Group
2	Recent Community Participation	2	Community engaged
3	Low or unknown Community Participation	3	Inactive Community Group
3	Low or unknown Community Participation	4	Lack of community participation
3	Low or unknown Community Participation	5	Actively being degraded/ neglected
3	Low or unknown Community Participation	6	no info (reserve Ids 51,54,55)

Threatened flora

For threatened flora each species was initially prioritised by threat status based on the schedules of the EPBCA and the TSPA (Table 5). Each species was also scored for the susceptibility of its life form to the impact of weeds, for example orchids are considered to be more susceptible than shrubs and shrubs more susceptible than trees. The sum of the threat status and the life form susceptibility scores was classed and used as the strategic priority for threatened flora (Table 6).

Table 5. Threatened flora classification based on listing schedules of the EPBCA and TSPA.

EPBCA 1999	TSPA 1995	Schedule class / # number		
		1	**2**	**3**
Critically Endangered	endangered	3		
Endangered	endangered	3		
	vulnerable	1		
Vulnerable	vulnerable		2	
Vulnerable			1	
	endangered		8	
	rare			50
	rare (P)			1
	vulnerable			4
	vulnerable (P)			1
Grand Total		**7**	**11**	**56**

Table 6. Threatened flora strategic priorities based on schedule class and life form susceptibility.

Sched Class	Susceptibility	Rank class / # species		
		1	**2**	**3**
1	1	5		
	2	2		
2	1	7		
	2		3	
	3			1
3	1		9	
	2			37
	3			10
Total # species		**14**	**12**	**48**

Vegetation

All native vegetation was classified according to the threat status on the Nature Conservation Act 2002 and the extent present in the municipal area (Table 7).

Table 7. Native vegetation priorities based on threat status and area (ha) in the KMA.

Strategic priority	***Rationale***	***Area (ha)***
1	Threatened & rare<50 ha	307
1	other native & rare<100 ha	502
2	Threatened	5794
3	other native	47843
	TOTAL Area	54445

7.2 Site selection

Site definition

The entire Kingborough Municipal Area was divided into a 500 m * 500 m grid. Each grid square represents a site. Each site was attributed a score for each of the selection drivers described above. This scale is appropriate to accommodate the precision of data, including weed and threatened species records, Tasveg mapping and cadastral boundaries.

Only sites with weeds are considered. The selection is based on the highest priority weed at the site. The other drivers attributed to each site may occur anywhere in the grid square. As a result, a priority weed in the grid square may not occur in a reserve that is recorded as present in the same grid square and may not occur in the threatened species habitat or threatened vegetation that is recorded in the grid square. Nevertheless, the priority weed cannot be more than 500 m from the other attributes and so is worth consideration.

Site prioritisation

The initial priorities are based on ranked strings. The strings are constructed as continuous numbers in which each digit in the string represents a separate driver in the order of priority. So the string for a site with all of the highest ranked drivers would look like 1111.

By selecting sites simply on the rank of the string, all priority 1 weed sites would be selected first with the order determined by the reserve status then flora then vegetation. The all priority 2 weeds sites would be selected etc. etc. Some sites with high priority threatened flora and or threatened vegetation could rank quite low if they are not associated with high priority weeds or reserves.

Optimisation includes selecting only the highest weed driven priorities in reserves before those outside; then weed driven sites within threatened species habitat before others etc. Figure 8 illustrates the optimised solution proposed for this strategy. The key in this figure describes the strings of selection criteria for each category. As a result of the optimisation process each category is mutually exclusive with a declining priority.

The effect of these compromise decisions to reorder the selection criteria for certain values of each, moves toward an optimum solution. There are numerous alternative ways that these criteria can be ranked.

All data can be visually explored and sites interrogated on a GIS to assist with selection of sites for works plans. This visual exploration of the data set is essential to understand the opportunities presented and the limitations of the analysis.

Figure 9 illustrates weed driven priorities and Figure 10 illustrtates community driven reserve priorities used in the ranked strings before optimisation.

Figure 11 illustrates the threatened flora susceptibility priorities and Figure 12 illustrates the vegetation priorities used in the ranked strings before optimisation.

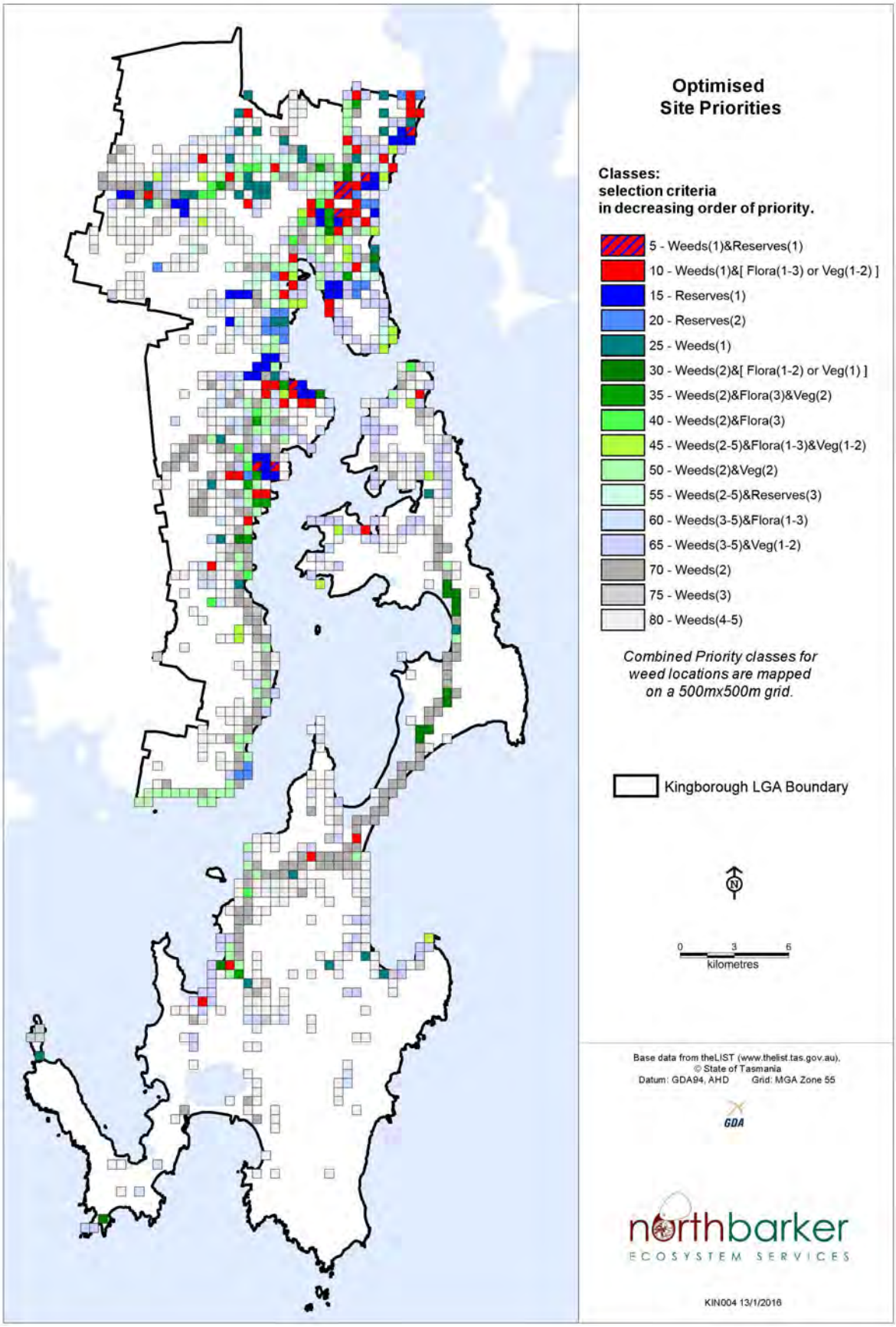


Figure 8 - Optimised site priorities.

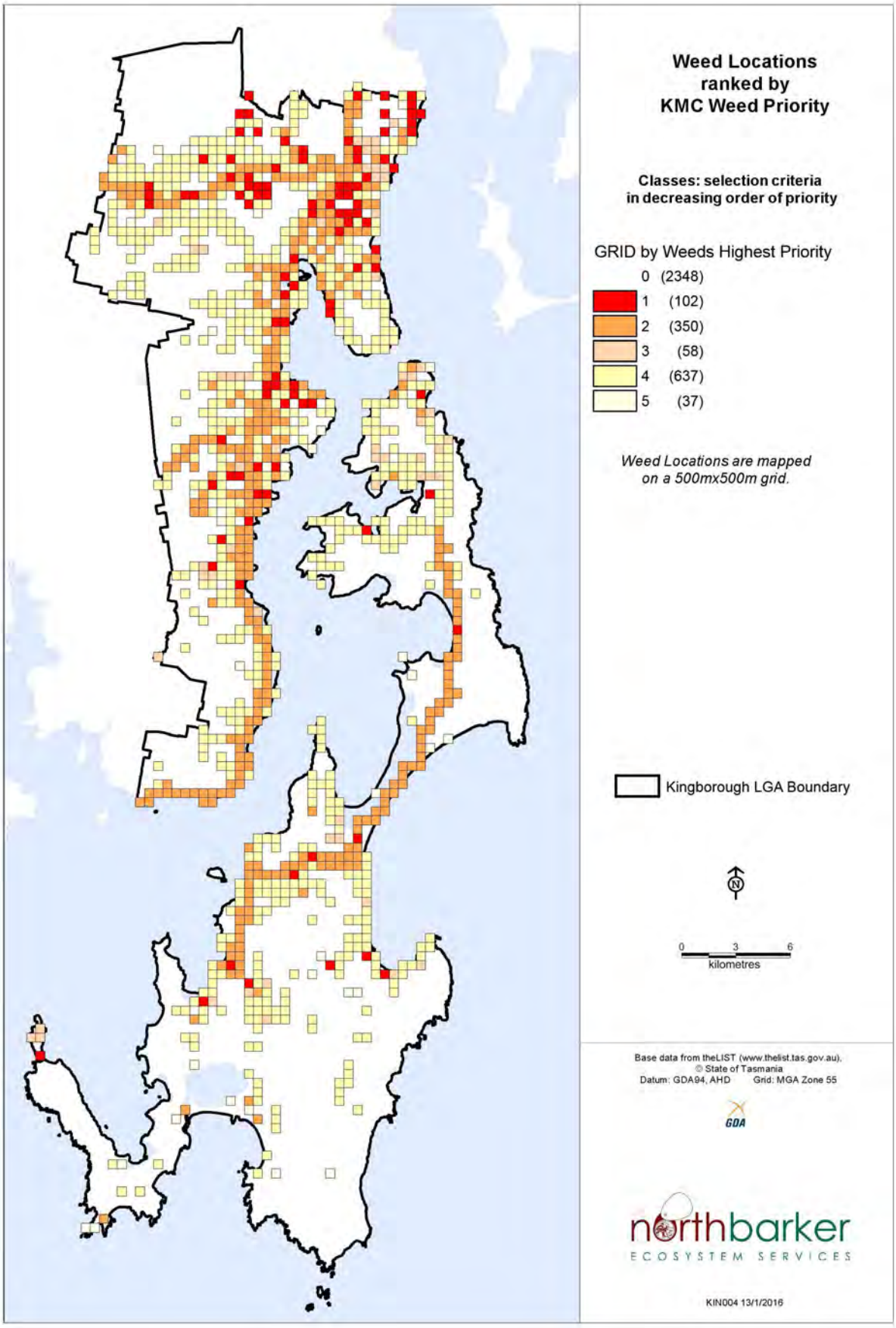


Figure 9 - Weed driven priorities.

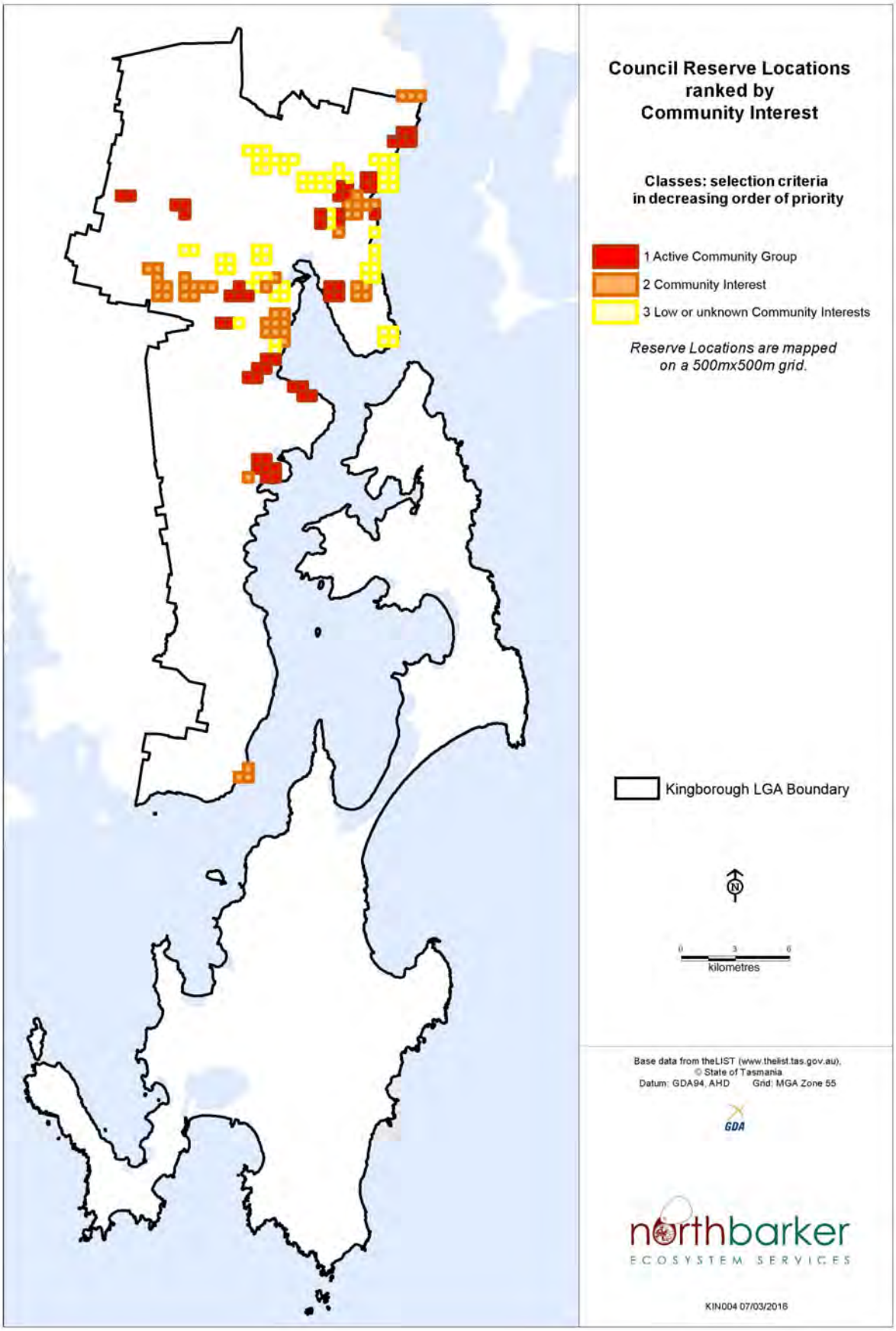


Figure 10 - Community driven reserve priorities.

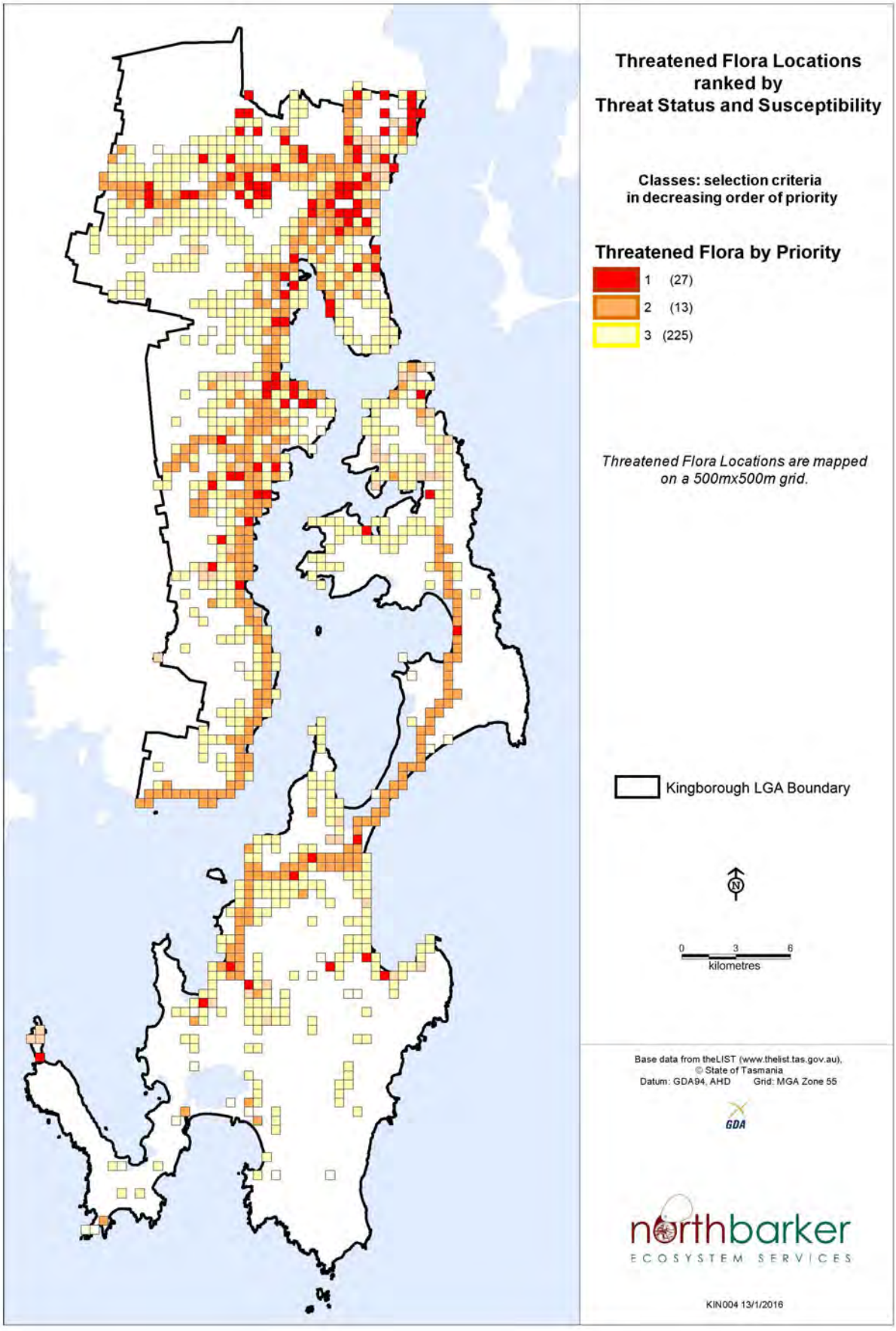


Figure 11 - Threatened flora priorities.

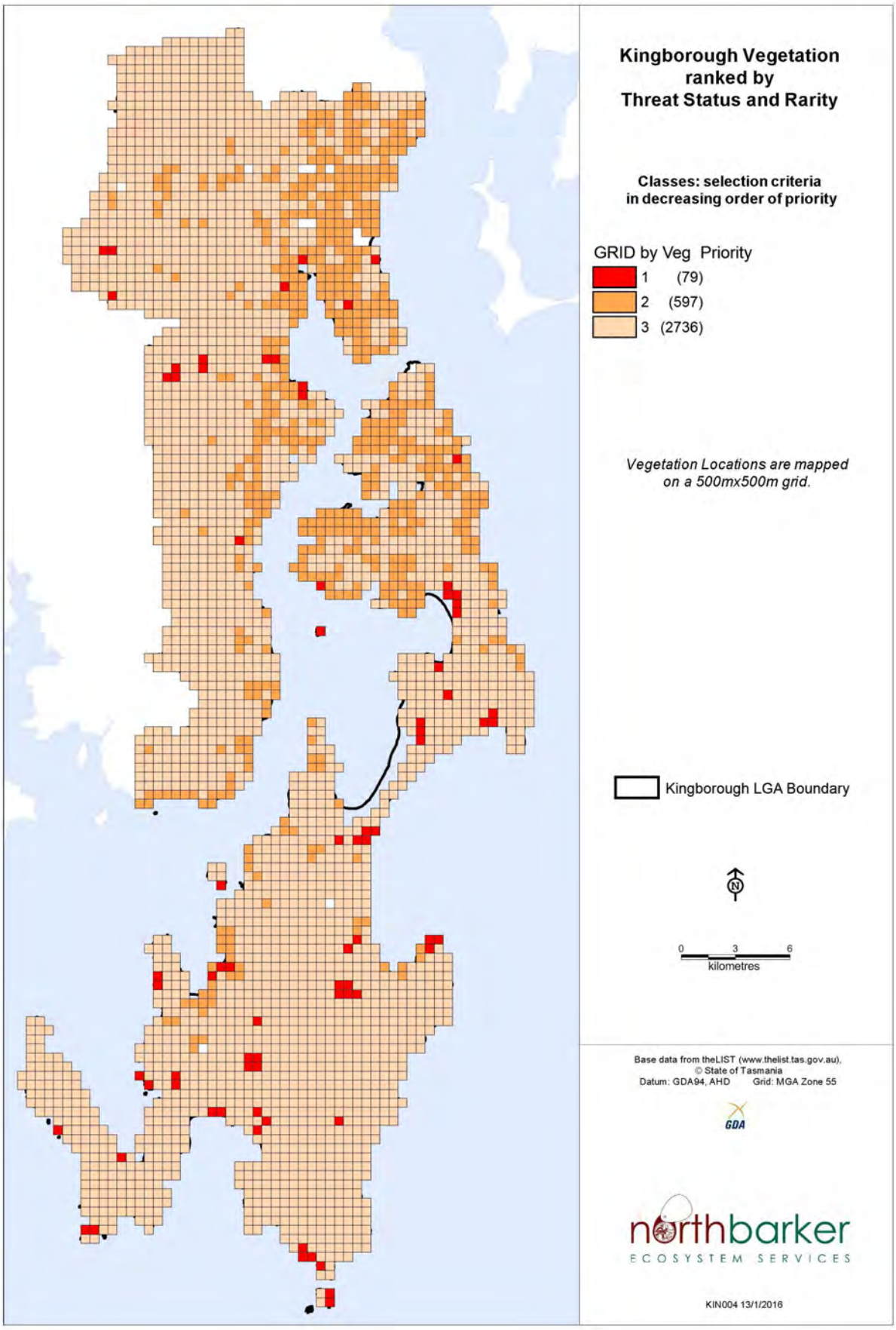


Figure 12 - Vegetation priorities.

Weed Management Zones

Weed management techniques should be adapted to take account of particular habitat sensitivities in one place or another. For example, coastal sand dunes are very sensitive to erosion and so physical disturbance needs to be minimised. Riparian areas are so close to waterways that the potential for pollution must be considered.

The habitats that require specific management regimes are here defined as weed management zones (WMZ). The WMZ's have not been used to attribute management priorities. However, each site selected for treatment is also identified by weed management zone, together with the relevant management prescription. Figure 13 illustrates the distribution of the WMZ's.

7.3 Coastal

All land within 40 m of the high tide level.

As throughout the rest of Australia, a high proportion of the Kingborough population resides near or utilises the coast. Hence, coastal habitats are under relatively high weed pressure. The coastal zone is also characterised by highly erodible soft sediments and naturally disturbed ground, including dunes. The coastal zone is home to characteristic habitats and species, some of which are directly threatened by weeds. Consequently, weed control in this important but fragile habitat should proceed with particular caution.

The major risks and mitigations are as follows.

Risk: Occupation of the site or adjacent beach by shorebirds.

Mitigation: Ensure that weed control is undertaken outside of the spring and early summer period to avoid disturbance.

Risk: Herbicide translocation through sandy soil to non-target species.

Mitigation: Employ alternative methods to spraying herbicide, particularly cut and paste and physical removal. If it is necessary to spray herbicide near or on dunes then use of non-residual herbicides that do not move through the soil profile is required. An off label permit is required for chemical control of marram grass.

Manual control is only effective for small infestations. For rhizomatous plants such as marram grass, dig out all rhizomes to a depth of 50 cm and repeat every 3 or 4 weeks until the rhizomes stop growing through to the surface. Monitor periodically thereafter. The use of machinery can greatly increase the area that can be treated, but should only be used where the benefits outweigh the risks of erosion.

Risk: Erosion of dunes.

Mitigation:

- Revegetation of the site
- Laying brush on the site to protect from wind erosion
- Protection of the site from access by people

The erosion caused by marram removal is often a movement towards a new equilibrium dune shape. Nevertheless, the potential for unwanted erosion should be managed.

7.4 Riparian

All land within the KMA waterway layer.

Riparian areas are very important contributors to the protection of water quality. They also represent specific habitats and refuges for plants and animals. However, riparian

areas are particularly susceptible to weed invasion. Relatively moist soils support the growth of weeds; disturbance by floods promotes seed dispersal and germination; and low levels of management due to difficult access provide windows for establishment.

The management of weeds in riparian areas should also be strategic by recognising that weed propagules move through catchments in drainage water from paddocks, roads and urban areas, into creeks and rivers. The main strategic requirement is to consider the higher order streams and sources of weeds in an overall riparian management approach. Where practical, start at the top of the catchment; notwithstanding other priorities, which may require lower catchment sites to also be managed.

The association of the habitat with fresh water and the susceptibility of rivers and creek banks to erosion requires that riparian weed control measures include certain precautions.

Risk: Chemical water pollution.

Mitigation: Use non chemical methods as much as possible.

Herbicide selection – herbicides applied to the edge of a water body or wetted areas must be registered for use in aquatic environments by the Australian Pesticides and Veterinary Medicines Authority. The herbicides must have the following characteristics:

- low eco-toxicity
- nil or low volatility at all temperatures (e.g. <10–6 mm Hg), to reduce spray drift potential
- low water solubility (e.g. <3 mg/L), to reduce potential for leaching to groundwater
- high soil absorption co-efficient (e.g. Koc >1900 cm3/g), to reduce potential for leaching to groundwater
- short half-life (in water <15 days; aerobic soil metabolism <610 days; anaerobic soil metabolism <9 days)

Risk: Erosion of riparian soils and banks.

Mitigation: Gradual progressive weed control avoiding large scale soil disturbance.

Cut and paste or drill and fill, and leave stumps in place to avoid soil disturbance.

Remove large dead weeds, particularly willows, to avoid stream blockage, flooding and scouring.

Rehabilitation will help to sustain the function of the riparian area as a filter strip and provider of shade, thus contributing to the maintenance of water quality. Rehabilitation will also aid in the suppression of the regrowth of weeds.

7.5 Threatened Species Habitat

Threatened species and their habitats are a very high priority for protection through weed control. Threatened plants are susceptible to herbicides and may be killed just as readily as weeds. Threatened fauna are susceptible to habitat alteration due to weed removal. This is particularly important where weeds have contributed to protection from predators or by providing nesting opportunities.

Weed control in threatened species habitats must therefore proceed with caution.

Risk: Spraying threatened plants with herbicide.

Mitigation:

- Know how to identify the threatened plants
- Mark plants in small patches to be controlled

- Control weeds progressively in the small patches
- Avoid the use of herbicide where possible

If herbicide must be used then apply by cut and paste method or apply a selective herbicide that does not affect the threatened species. For example, if the threatened plant is a grass and the weed is woody, then use a selective woody weed herbicide.

Apply sprays with a hooded nozzle from short range, with a large droplet size and from a down-wind position.

Risk: Weed removal destroys animal habitat.

Mitigation: Determine what species are using the habitat and what the critical component is that the weeds are offering. For example, ground level protective cover for ground nesters.

Control weeds progressively in the small patches.

Rehabilitate patches with high covers of native plants that provide the same habitat quality.

7.6 Urban

The urban zone includes all land that is predominantly developed for housing and commercial use.

The urban landscape presents at least two distinct weed management requirements. The first is the control of weeds of all types that are highly visible to the public. Visibility in urban areas is high because weeds are obvious when in footpaths, along roadsides and in all places where visitation is high.

The presence of people brings with it scrutiny of weed control practices. Such scrutiny presents as opinions that are often poles apart. One pole being that the weeds must be controlled with little consideration of the method, the other being that the application of herbicides in public places is undesirable.

Weeds in urban areas, such as on streets and footpaths are often controlled by implementing weed spray "programs". Such programs are often driven by the calendar and are repeated whether necessary or not.

When planning to control weeds in the urban zone the following should be considered and applied as practicable.

Risks:

- Herbicide may be washed from streetscapes into water ways
- The public will critices Council if visible weeds are not controlled
- Sites that cannot be accessed easily become sources of weeds

Mitigation:

- Alternative weed control measures should be considered where appropriate. These include the application of steam to treat footpaths when a weed species is sensitive to steam.
- Urban parks and gardens can be planted with high covers of desirable plants and the ground heavily mulched.
- Landscape access can be improved so that weeds can be mowed. For example, producing or modifying batters so that they are not too steep for mowing.

- Seal cracks and joints in footpaths and other surfaces that support weeds.

7.7 Quarries, Landscaping and Transfer Stations

Quarries and transfer stations are import and export sites. The users of these sites bring vehicles and materials from far afield and then carry materials far afield. The materials include earth products and mulches. The sites are prone to weed infestation because they have lots of disturbed land and have lots of visitors. As sources of weed seeds, mitigation efforts at these sites can have dramatic impacts by reducing spread to sites that receive the products.

Risks:

- Weed seeds are exported from these sites in products
- New weeds arrive at these sites through imports of product and visitor vehicles
- Land adjacent to these sites is vulnerable

Mitigation:

- All sites should have and implement a seasonally based weed control plan
- All sites should be certified as weed free periodically (every two years)
- Stock piling of material should be kept to a minimum to avoid contamination

7.8 No Spray Areas

Some areas are no spray zones (NSZ) for a variety of reasons. Some are for perceived health risk, personal choice and protection of organic production.

Risks:

- Weeds are not controlled adequately
- NSZ becomes source of weeds

Mitigation:

- Cooperative management agreements whereby the adjacent landowners control the weeds
- Monitor weed management and apply aspects of integrated weed management and techniques that are best suited to the circumstances

7.9 Peri Urban and Rural Areas

The peri urban and rural areas in the KMA are strongly associated with residential development in and adjacent to native vegetation. The area is diverse and privately owned. This zone is an extremely important one for the maintenance of a broad range of vegetation types and habitats. The primary responsibility for weed control rests with the landowners. However, the Tasmanian WMA requires that land owners prevent declared weeds from spreading to threatened species habitat and threatened vegetation communities. This regulation applies to their own land, adjacent land and to land that is being managed under a weed management plan. Despite these regulations, some severe weed infestations are present on some properties, particularly on large blocks that tend to be beyond the management capacity of most owners.

Risks:

- Lots in and adjacent to remnant native vegetation become sources of weeds

- Threatened species and communities on environmental living lots are degraded by weeds

Mitigation:

- Cooperative weed management agreements
- Coordinated weed management agreements
- Rate rebate scheme
- Reverse auction scheme
- Encourage landowners to participate in Landcare programs
- Enforcement of WMA regulations

7.10 Other Areas

Beyond these specific WMZ's no modification to best practice weed management is recommended but where circumstances demand adjustments to mitigate risks should be made.

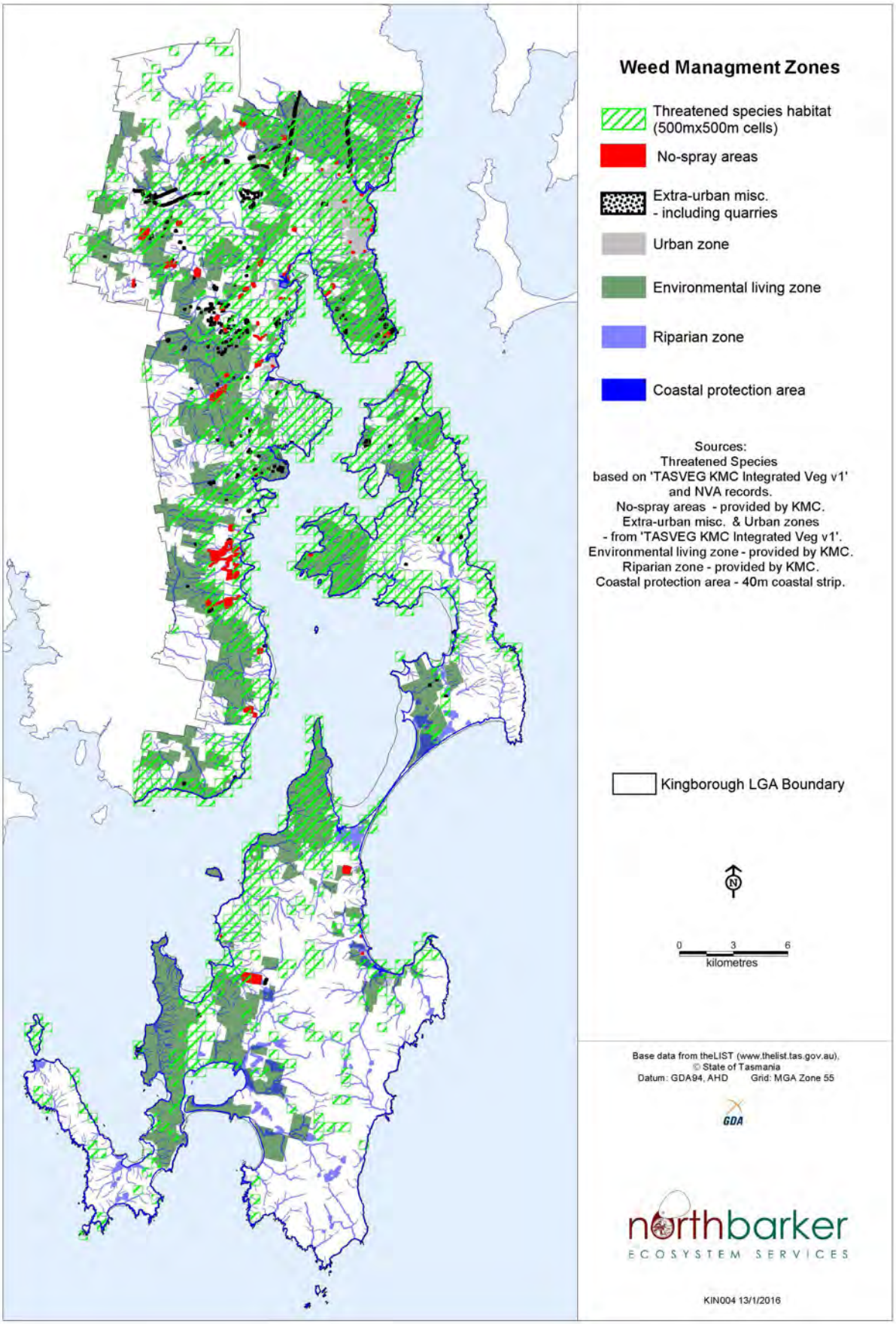


Figure 13 - Weed Management Zones

8 ROADSIDE WEED MANAGEMENT

Roads and roadsides are by far the most effective vectors of weeds. Vehicles can pass along them from anywhere in the State (or country), with little to no effective control with regard to weeds being carried in radiators, in mud, or on floor mats, *etc*. Vehicles are capable of delivering new weeds to Kingborough and roadsides provide viable habitat for them to establish. The management of roadside weeds in itself can spread weeds, particularly through the use of slashers.

There are a number of strategic weed management prescriptions that can reduce the spread of weeds along roadsides.

1. Establish a cooperative weed management plan with the State Government department responsible for roads.
2. Establish coordinated weed management plans with landowners adjacent to strategically important roads.
3. Map roadsides for weeds.
4. Based on weed maps, plan and slash areas free of weeds before slashing areas infested.
5. Within infested areas, to prevent spread begin all roadside slashing at the limit of the weeds and work toward the centre of the infestation.
6. Wash vehicles and machinery before entering a weed free section.
7. Remove weeds from roadside refuges where slashers do not reach, such as close to fence lines.

9 CLASSIFYING LOCAL WEEDS USING THE WMA CATEGORIES

The *Vegetation Management Act 1999* categorises declared weeds based on their distribution within the State and municipalities. Based on distribution, municipalities are classified as either Zone A or Zone B for respective weeds. Management objectives are based on the zone categories at the municipal level.

Zone A weeds include weeds not known or not yet present in a municipality, as well as weeds that are localised in extent. The management aim is prevention or eradication.

Zone B weeds are those that are known to be present and are sufficiently widespread and abundant that eradication is not feasible. As such control of spread and containment are the management aims.

This zone classification with associated management aims could be applied to non-declared weeds at the municipal level. The distribution logic is the same and the management aims would be justifiable if the non-declared weeds are deemed to be a threat to either agriculture or to biodiversity. However, most non-declared weeds are in fact not deemed to present the same level of threat to agriculture and biodiversity as declared weeds. Note that numerous non-declared weeds have not have risk assessments completed. In this strategy they have not been categorised in the same way and have generally not been rated at the same level of priority as declared species. Nevertheless, the categorisation of non-declared weeds using the same distributional criteria is worthwhile. The categorisation could then be integrated or applied in parallel with the declared weeds.

REFERENCES

Australian Bureau of Statistics (2011). Census statistics. Website: http://www.abs.gov.au/websitedbs/censushome.nsf/home/data

Australian Weeds Committee (2006). *Australian Weeds Strategy; A national strategy for weed management in Australia.* Natural Resource Management Ministerial Council

Kingborough Council (2014). *Draft Interim Kingborough Planning Scheme 2014*, Tasmania.

CRC for Australian Weed Management (2002) Best Practice Management Guideline for Environmental Weeds. ISSN 1442-7192.

Department of Primary Industries Water and Environment, Forestry Tasmania and Agricultural Contractors of Tasmania. (2004) *Tasmanian Washdown Guidelines for Weed and Disease Control: machinery, vehicles and equipment, edition 1*: Department of Primary Industries, Water and Environment, Hobart.

DPIPWE (2013). Department of Primary Industries, Parks, Water and Environment. TASVEG 3.0, Released November 2013. Tasmanian Vegetation Monitoring and Mapping Program, Resource Management and Conservation Division.

EPA South Australia (2007). Safe and effective herbicide use. A handbook for near-water applications.

Greening Australia Incentive Programs Design and Implementation Cobnsiderations. (undated PDF)

http://www.environment.gov.au/system/files/pages/c4a2d7e0-87f8-48de-b0b7-d8ab55d41ca1/files/incentives-program.pdf

Grimm, S. (2012). The Value of Understanding. Philosophy Compass 7/2 103-117.

Hilmarsson, S.T., and Rikhardsson, RP. *The evolution of motivation and incentive systems Research : A Literature Review*. SSRN.

Lucas, C. (2006). Practical Multiobjective Optimisation.

http://www.calresco.org/lucas/pmo.htm

Southern Tasmanian Weed Strategy Draft 2011 – 2016, Southern Tasmania Natural Resource Management Region

Tasmanian State Government (1995). Threatened Species Protection Act 1995. No.83 of 1995. Government Printer, Hobart, Tasmania

Tasmanian State Government (1999). Weed Management Act 1999. No.105 of 1999. Government Printer, Hobart, Tasmania.

APPENDIX 1 – POLICY AND LEGISLATION OVERVIEW

Tasmanian *Weed Management Act 1999*

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

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

There are 115 weeds that have been declared for Tasmania. 36 of these weeds have a presence within the Kingborough municipality and are detailed in Appendix 3 - Appendix 8.

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

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

Under the WMA, landholders are under a legal requirement to control weeds on their land. Weed Inspectors are given powers to enforce the requirements of the Act; they can be employees under State or local government or relevant bodies including community groups. Kingborough has five staff trained under the WMA as weed inspectors, including six city rangers plus the Natural Assets Officer. These inspectors must undergo training relating to their responsibilities under the WMA and have the responsibility of enforcing this Act. Failure to abide with the Act can result in on-the-spot fines or a requirement notice issued by an Inspector, requiring a landholder to undertake specific weed management actions.

Weeds of National Significance

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

10 of the WONS have a recorded presence within the Kingborough Municipality Appendix 3 on page 53). These are bridal creeper, boneseed, English and canary brooms, African boxthorn, Chilean needle grass, serrated tussock grass, blackberry, willows and gorse.

All of the original 20 WONS are now declared under the WMA and all jurisdictions have agreed to declare all WONS species even if that weed is unlikely to occur in that jurisdiction. The intent of this action is to prevent the sale and trade of any WONS species.

Implications to Strategy

- Consider national targets for WONS into local weed control programs
- Grant applications to the Commonwealth should include clear reference to WONS strategic goals

National Environmental Alert List

Plant species that are in the early stages of establishment with the potential to become a significant threat to biodiversity are shown on the National Environmental Alert List[6]. 10 of these species are declared under the Tasmanian *Weed Management Act 1999*. To date there are 28 exotic weeds on this list, of which 11 are known from Tasmania or have may have suitable habitat within Tasmania (Appendix 6 – National Environmental Alert List on page 62).

Southern Tasmania Weed Management Strategy

The Southern Tasmanian Weed Strategy (STWS) is based on principles adopted from the *Australian Weeds Strategy* 2007 developed by the Australian Weeds Committee. These are:

I. Weed management is an essential and integral part of the sustainable management of natural resources for the benefit of the economy, the environment, human and amenity.

II. Combating weed problems is a shared responsibility that requires all parties to have a clear understanding of their roles.

III. Good science underpins the effective development, monitoring and review of weed management strategies.

IV. Prioritisation of and investment in weed management must be informed by a risk management approach.

V. Prevention and early intervention are the most cost-effective techniques for managing weeds.

VI. Weed management requires coordination among all levels of government in partnership with industry, land and water managers and the community regardless of tenure.

VII. Building capacity across government, industry, land and water managers, and the community is fundamental to effective weed management.

Tasmania's weed management strategy, *Weed Plan,* is also based around these principles.

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

I. Adequate resources are required to coordinate implementation of the strategy;

[6] accessed via http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/alert.html

II. Key stakeholders engaged and agreed longer-term action plan developed;

III. Appropriate approvals sought from land managers and agencies;

IV. Appropriate hygiene practices developed and implemented;

V. Infestation(s) surveyed and recorded using National Core Attributes for weed mapping and data fed into the DPIPWE Natural Values Atlas annually;

VI. Agreed best practice integrated weed management principles used to control weeds;

VII. Outlier plants treated first, then infestation contracted towards core area; and

VIII. Annual monitoring and follow-up program committed to for at least seven years.

The KMAWMS incorporates these principles into the strategy and action plan.

Implications to Strategy

- Strategy should adopt principles within Southern Tasmania Weed Mgt Strategy

Regional High Priority Weeds

Weed priorities for the Southern Region as a whole and for each of the twelve municipalities have been identified to assist with planning and on-ground works.

There are over 30 high priority weeds. Baseline weed mapping is available on the DPIPWE Natural Values Atlas (www.naturalvaluesatlas.tas.gov.au). Regional eradication targets include chilean needle grass, bridal creeper, seeding willows, cutleaf nightshade, heather, African feathergrass, African lovegrass, espartillo and orange hawkweed plus the strengthening and contracting of containment lines for boneseed. The following link is to a booklet of these weeds of southern Tasmania.

http://stca.tas.gov.au/weeds/wp-content/uploads/2010/01/Weeds-of-S-Tas-booklet-smaller.pdf

The current list of 30 weeds is now out-dated and some weeds listed as a regional priority are not necessarily a priority within Kingborough (Appendix 7 on page 64).

Implications to Strategy

- High Priority Weeds for the southern region should form part of the focus of weed control programs however not all species on this list are prominent weeds within the municipality. Refine list of weeds and incorporate into weed priorities.

Kingborough Interim Planning Scheme 2015

The Kingborough interim Planning Scheme 2015 regulates the development approvals process. The current planning scheme does not provide any explicit prescriptions for the management of particular weed species. Conditions of approval are often included which aim to include weed management planning during and post development in order to minimise impacts to natural values.

The Kingborough Interim Planning Scheme 2015 applies the Biodiversity Code (E10). The purpose of the code is to protect threatened vegetation communities, threatened species habitat and other significant vegetation values. It also aims to protect rather than just minimise loss of threatened native vegetation and threatened species.

Kingborough Interim Planning Scheme 2015 includes a Biodiversity Management Zone. The Code is explicit in identifying vegetation types and habitats that require protection.

Implications to Strategy

- Include list of local environmental weeds in the Kingborough Interim Planning Scheme 2015.

APPENDIX 2 - STAKEHOLDERS BY LAND TENURE AND AREA (HA).

Parcel Description	Tenure	Area (ha)
Aboriginal Land	Freehold Title	42.54
Acquired Road	Crown Land	350.83
	Freehold Title	0.03
Aurora Energy Pty Ltd	Freehold Title	0.54
Casement Unknown	Unknown	1.02
Commonwealth of Australia	Commonwealth of Australia	2.70
Department of Education	Crown Land	61.29
Dept. of Health and Human Service	Crown Land	7.23
Dept. of Police and Public Safety	Crown Land	0.84
DPIPWE (Crown Land Services)	Crown Land	1980.61
	Marine Crown Land	0.00
	Tidal Crown Land	216.18
	Vertical Subdivision	2.63
DPIPWE Future Potential Production Forest	Crown Land	5258.01
Footway	Council	12.27
	Crown Land	0.01
	Freehold Title	4.86
	Unknown	0.08
Forestry Tasmania	Crown Land	2401.17
Horseway	Council	1.46
Housing Tasmania	Freehold Title	92.80
	Horizontal Strata	2.38
	Vertical Strata	0.08
Hydro Electric Corporation	Freehold Title	0.01
LGA Subdivision Road	Council	128.65
	Crown Land	14.30
	Freehold Title	180.12
Local Government Authority	Council	651.78
	Crown Land	0.04
	Freehold Title	22.43
	Vested	1909.31
Marine and Safety Tasmania	Crown Land	0.02
Onshore Water Body	Not Applicable	35.64
Parks and Wildlife Service	Crown Land	12454.13
	Marine Crown Land	211.33
	Tidal Crown Land	1765.25
Private Parcel	Body Corporate	288.96
	Council	1.52
	Freehold Title	44906.97
	Horizontal Strata	238.39
	Multiple Interest	0.20
	Share Title	11.76
	Unknown	2.94

Parcel Description	Tenure	Area (ha)
	Vertical Strata	8.96
Reserved Road	Crown Land	144.06
	Freehold Title	0.28
	Unknown	0.53
Road (type unknown)	Council	0.52
	Crown Land	33.12
	Freehold Title	3.18
	Unknown	850.54
State Fire Commission	Freehold Title	2.78
State Growth (DIER)	Crown Land	34.83
State Growth (Econ Dev)	Freehold Title	2.17
Subdivision Road	Body Corporate	0.13
	Council	20.59
	Crown Land	16.11
	Freehold Title	38.86
	Unknown	1.46
Tasmanian Ambulance Service	Crown Land	0.12
Tasmanian Ports Corporation Pty Ltd	Freehold Title	0.25
TasWater	Freehold Title	12.82
Tramway	Crown Land	5.10
	Unknown	0.78
Transend Networks Pty Ltd	Freehold Title	8.12
University of Tasmania	Crown Land	2.27
User Road	Crown Land	0.17
	Freehold Title	6.92
Walkway	Council	0.14
	Freehold Title	0.08
Water Race	Crown Land	0.12
Total		**74458.33**

APPENDIX 3 - PRIORITY DECLARED WEEDS IN KINGBOROUGH MUNICIPALITY.

A = WMA A, B = WMA B, li = local infestation, io = infestation outlier, wi = widespread infestation.

Species	Common name	WMA	WONS	Schedule 9	Rank	Local zone
Amsinckia sp.	fiddleneck	A	-	-	2	Ali
Asparagus asparagoides	bridal creeper	A	Yes	Yes	1	Aio
Calluna vulgaris	heather	A	-	-	2	Awi
Carduus nutans	nodding thistle	A	-	-	1	Ali
Cenchrus macrourus	african feather grass	A	-	-	1	Aio
Coprosma robusta	karamu	A	-	-	1	Ali
Cortaderia jubata	pink pampas grass	A	-	Yes	1	Ali
Cortaderia selloana	common pampas grass	A	-	Yes	4	Bwi
Cortaderia sp.	pampas grass	A	-	Yes	4	Bwi
Cytisus multiflorus	white spanish broom	A	-	Yes	1	Aio
Echium plantagineum	paterson's curse	A	-	Yes	2	Awi
Hieracium aurantiacum	orange hawkweed	A	-	-	1	Ali
Hypericum perforatum	St John's wort	A	-	-	1	Ali
Lepidium draba	white weed	A	-	-	1	Ali
Marrubium vulgare	horehound	A	-	-	1	Aio
Nassella tenuissima	mexican feather grass	A	-	-	1	Ali
Orobanche minor	lesser broomrape	A	-	-	1	Ali
Rorippa sylvestris	creeping yellow cress	A	-	-	1	Aio
Urospermum dalechampii	mediterranean daisy	A	-	-	1	Aio
Asteraceae sp.	thistle	B	-	-	4	Bwi
Carduus pycnocephalus	slender thistle	B	-	-	1	Ali
Carduus tenuiflorus	winged thistle	B	-	-	1	Ali
Chrysanthemoides monilifera subsp. monilifera	boneseed	B	Yes	Yes	4	Bwi
Cirsium arvense	californian thistle	B	-	-	1	Ali
Cytisus scoparius	english broom	B	Yes	Yes	4	Bwi
Erica lusitanica	spanish heath	B	-	Yes	4	Bwi
Foeniculum vulgare	fennel	B	-	-	4	Bwi
Genista monspessulana	montpellier broom	B	Yes	Yes	4	Bwi
Genista / Cytisus	broom	B	-	Yes	4	Bwi
Leycesteria formosa	elisha's tears	B	-	Yes	4	Bwi
Lycium ferocissimum	african boxthorn	B	Yes	Yes	3	Bli
Rubus fruticosus	blackberry	B	Yes	Yes	4	Bwi
Salix cinerea	grey willow	B	Yes	-	4	Bwi
Salix sp.	willow	B	Yes	-	3	Bli
Salix x fragilis notho	crack willow	B	Yes	Yes	4	bwi
Senecio jacobaea	ragwort	B	-	Yes	4	Bwi
Ulex europaeus	gorse	B	Yes	Yes	4	Bwi

APPENDIX 4 - KINGBOROUGH LOCAL ENVIRONMENTAL WEEDS

Species	Common name	Schedule 9[7]	Rank
Acacia baileyana	cootamundra wattle	1	5
Acacia howittii	sticky wattle	-	5
Acacia pravissima	ovens wattle	-	5
Acacia provincialis	swamp wirilda or perennial wattle	-	5
Acacia pycnantha	golden wattle	1	5
Acacia retinodes	wirilda	1	2
Achillea millefolium	yarrow	1	5
Agapanthus praecox subsp. *orientalis*	agapanthus	-	5
Ammophila arenaria subsp. *arenaria*	marram grass	-	5
Arctotheca calendula	capeweed	-	5
Billardiera heterophylla	bluebell creeper	1	1
Brassica sp.	brassica	-	5
Briza minor	lesser quaking-grass	-	5
Chamaecytisus palmensis	Tree Lucerne	1	5
Cirsium vulgare	spear thistle	-	5
Conium maculatum	hemlock	-	5
Conyza sp.	fleabane	-	5
Coprosma repens	mirror bush	1	5
Cotoneaster franchetii	grey cotoneaster	1	5
Cotoneaster glaucophyllus	largeleaf cotoneaster	1	5
Cotoneaster pannosus	velvet cotoneaster	1	5
Cotoneaster sp.	cotoneaster	1	5
Cotoneaster symondsii	himalayan cotoneaster	1	5
Crataegus monogyna	hawthorn	1	5
Crocosmia Xcrocosmiiflora	montbretia	1	5
Cyperus eragrostis	umbrella sedge	-	5
Dactylis glomerata	cocksfoot	-	5
Delairea odorata	cape Ivy	1	5
Digitalis purpurea	foxglove	1	5
Dipsacus fullonum	wild teasel	-	5
Equisetum hyemale	rough horsetail	-	5
Euryops abrotanifolius	winter euryops	1	5
Fuchsia magellanica	fuchsia	1	5
Gazania sp.	gazania	-	5
Glyceria maxima	reed sweetgrass	-	2
Hedera helix	ivy	1	5
Holcus lanatus	yorkshire fog	-	5
Hypericum androsaemum	tutsan	-	5

[7] Schedule 9 list of weeds in the Kingborough Planning Scheme 2000

Species	Common name	Schedule 9[7]	Rank
Ilex aquifolium	holly	1	1
Kunzea ericoides	burgan	-	1
Leucanthemum vulgare	oxeye daisy	1	5
Ligustrum vulgare	privet	-	5
Lupinus arboreus	tree Lupin	1	5
Paraserianthes lophantha	cape Leeuwin wattle	1	5
Paspalum dilatatum	paspalum	-	5
Passiflora tarminiana	banana passionfruit	1	2
Pelargonium alchemilloides	pelargonium	-	5
Phalaris aquatica	toowoomba canarygrass	-	5
Pinus radiata	radiata pine	1	2
Pittosporum undulatum	sweet pittosporum	1	5
Potentilla anglica	trailing cinquefoil	-	5
Psoralea pinnata	blue butterfly bush	1	5
Reseda luteola	wild mignonette	-	5
Reseda sp.	mignonettes	-	5
Rosa rubiginosa	briar rose	1	3
Rosa sp.	wild rose	-	5
Rumex crispus	curled dock	-	5
Rumex pulcher subsp. *pulcher*	fiddle dock	-	5
Rumex sp.	dock	-	5
Salix matsudana	sallow willow	-	5
Salix x calodendron	shrub willow	-	5
Salix x pendulina var. *pendulina*	weeping willow	-	5
Senecio angulatus	climbing groundsel	-	5
Typha latifolia	cumbungi	-	5
Verbascum sp.	mullein	-	5
Vinca major	blue periwinkle	1	3
Watsonia meriana var. *bulbillifera*	watsonia	1	2
Zantedeschia aethiopica	arum lily	-	5

APPENDIX 5 – ZONE A WEEDS THAT NOT RECORDED IN KINGBOROUGH.

Declared weeds not currently known within Kingborough Municipal Area			
Weed	**WMA Zone**	**Distribution in Council and notes**	**WONS**
Acacia nilotica ssp. indica prickly acacia	Zone A	Not known to occur in Tasmania	YES
Alternanthera philoxeroides alligator weed	Zone A	Only known from gardens within Tasmania	YES
Amaranthus albus tumbleweed	Zone A	No known records in Kingborough	
Amelichloa caudata espartillo	Zone A	No known records in Kingborough	
Annona glabra pond apple	Zone A	Not known to occur in Tasmania	YES
Asparagus scandens asparagus fern	Zone A	No known records in Kingborough	YES
Bassia scoparia Kochia	Zone A	Not known to be naturalised in Tasmania	
Berberis darwinii darwin's barberry	Zone A	No known records in Kingborough	
Berkheya rigida african thistle	Zone A	No known records	
Bifora testiculata Bifora	Zone A	Not known to be naturalised in Tasmania	
Cabomba caroliniana cambomba	Zone A	Not known to be naturalised in Tasmania	YES
Carex albula, C. buchananii, C. flagellifera and *C. testaceae* new zealands	Zone A	No known records in Kingborough	
Cenchrus longispinus innocent weed *Cenchrus incertus* spiny burrgrass	Zone A	Not known to be naturalised in Tasmania	
Centaurea calcitrapa star thistle	Zone A	Not known to be naturalised in Tasmania	
Centaurea eriophora mallee cockspur	Zone A	Not known to be naturalised in Tasmania	
Ceratophyllum demersum hornwort	Zone A	Not known to be naturalised in Tasmania	
Chondrilla juncea skeleton weed	Zone A	Not known to be naturalised in Tasmania	
Crupina vulgaris common crupina	Zone A	Not known in Tasmania	

Declared weeds not currently known within Kingborough Municipal Area			
Weed	**WMA Zone**	**Distribution in Council and notes**	**WONS**
Cryptostegia grandiflora rubber vine	Zone A	Not known to occur in Tasmania	YES
Cuscuta species	Zone A	No known records in Kingborough	
Cynara cardunculus artichoke thistle	Zone A	Not known to be naturalised in Tasmania	
Cyperus esculentus yellow nut grass	Zone A	Not known to be naturalised in Tasmania	
Cyperus rotundus purple nut-grass	Zone A	Not known to be naturalised in Tasmania	
Cytisus multiflorus white spanish broom	Zone A	Not known to be naturalised in Tasmania	
Datura species	Zone A	No known records in Kingborough	
Dittrichia viscosa false Yellowhead	Zone A	Not known to be naturalised in Tasmania	
Egeria densa egeria/ dense water weed	Zone A	No known records in Kingborough	
Eichhornia crassipes water hyacinth	Zone A	Not known to be naturalised in Tasmania	
Eleocharis parodi parodi	Zone A	Not known to be naturalised in Tasmania	
Elodea canadensis canadian pondweed	Zone A	Occurs in the Coal River	
Equisetum species horsetail	Zone A	No known records in Kingborough. Occurs on the Tasman and at Cygnet	
Fallopia japonica japanese knotweed	Zone A	No known records in Kingborough	
Festuca gautieri bear-skin fescue	Zone A	Not naturalised in Australia	
Galium spurium false cleavers	Zone A	Not known to be naturalised in Tasmania	
Galium tricornutum three-horned bedstraw	Zone A	Not known to be naturalised in Tasmania	
Gymnocoronis spilanthoides senegal tea plant	Zone A	Not known to be naturalised in Tasmania	
Heliotropium europaeum common heliotrope	Zone A	Not known to be naturalised in Tasmania	
Heracleum mantegazzianum giant hogweed	Zone A	Not known to be naturalised in Tasmania	
Hydrilla verticillata hydrilla	Zone A	Not known to be naturalised in Tasmania	

Declared weeds not currently known within Kingborough Municipal Area			
Weed	**WMA Zone**	**Distribution in Council and notes**	**WONS**
Hymenachne amplexicaulis hymenachne	Zone A	Not known to be naturalised in Tasmania	YES
Hypericum tetrapterum square stemmed St John's wort	Zone A	No known records in Kingborough	
Lagarosiphon major oxygen weed	Zone A	Not known to be naturalised in Tasmania	
Lantana camara lantana	Zone A	Not known to be naturalised in Tasmania	YES
Miconia species miconia	Zone A	Not known to occur in Tasmania	YES
Moraea species cape tulips	Zone A	No known records in Kingborough	
Nassella hyaline cane needle grass *Nassella charruana* lobed needle grass	Zone A	No known records in Kingborough	
Oenanthe pimpinelloides meadow parsley	Zone A	No known records in Kingborough – 1st record in Tasmania late 2013 in the north	
Onopordum species cotton/stemless thistles	Zone A	No known records in Kingborough	
Orobanche species broomrape	Zone A	Not known to be naturalised in Tasmania	
Parkinsonia aculeata parkinsonia	Zone A	Not known to occur in Tasmania	YES
Parthenium hysterophorus Parthenium weed	Zone A	Not known to occur in Tasmania	YES
Pennisetum villosum feathertop	Zone A	No known records in Kingborough	
Prosopis species mesquite	Zone A	Not known to be naturalised in Tasmania	YES
Sagittaria montevidensis arrowhead	Zone A	Not known to be naturalised in Tasmania	
Sagittaria platyphylla sagittaria	Zone A	Not known to be naturalised in Tasmania	YES
Salpichroa origanifolia pampas lily of the valley	Zone A	No known records in Kingborough	
Salvinia molesta salvinia	Zone A	Not known to be naturalised in Tasmania	YES
Senecio glastifolius holly-leaved Senecio	Zone A	Not known to be naturalised in Tasmania	
Solanum elaeagnifolium	Zone A	Not naturalised but is occasionally recorded	YES

Declared weeds not currently known within Kingborough Municipal Area			
Weed	**WMA Zone**	**Distribution in Council and notes**	**WONS**
silver leaf nightshade		within the south east	
Solanum sodomaeum apple of sodom	Zone A	Not known to be naturalised in Tasmania	
Striga species witchweed	Zone A	Not naturalised in Australia	
Tamarix aphylla athel pine	Zone A	Not known to be naturalised in Tasmania	YES
Trapa species floating water chestnut	Zone A	Not naturalised in Australia	
Tribulus terrestris caltrop	Zone A	Not known to be naturalised in Tasmania	
Zizania species wild rice	Zone A	Not naturalised in Australia	

*

APPENDIX 6 – NATIONAL ENVIRONMENTAL ALERT LIST

(Shaded = declared weed or potential to establish)

Species	Common Name	Information
Asystasia gangetica	chinese/philippine violet	Restricted to NSW at this time
Barleria prionitis	barleria, porcupine flower	Prefers wet dry tropics of northern Australia
Bassia scoparia	**kochia,t**	**Has naturalised parts of temperate Asia and infestations have been recorded near carrot crops near Deloraine and Devonport.** **Declared Weed**
Culluna vulgaris	**heather**	**Known near Kingston and Bruny Island with past observations near Lake Augusta in Central highlands and near Meander in the north. Naturalised in New Zealand** **Declared Weed**
Chromolaena odorata	siam weed	Currently confined to northern Qld
Cynoglossum creticum	blue hound's tongue	Only known from near Eden, NSW
Cyperus teneristolon	sedge, cyperus	Only known from Katoomba, NSW along a creek line
Cytisus multiflorus	**white spanish broom**	**Only definitive records are from 3 sites in central Victoria. May be well adapted to Tasmania's climate** **Declared Weed**
Dittrichia viscosa	**false yellowhead**	**Recorded on the south coast of WA** **Declared Weed**
Equisetum spp.	**horestails**	**Naturalised in NSW, one of the world's worst weeds. Known from some small locations in northern Tasmania** **Declared Weed**
Gymnocorpus spilanthoides	senegal tea plant	Weed of tropical and subtropical areas
Hieracium aurantiacum	**orange hawkweed**	**Known from NSW to Victoria as well as Central Highlands of Tasmania and Fern Tree near Hobart which is the largest infestation. Has also been noted at Snug.** **Declared Weed**
Koelreuteria elegans subsp. formosana	chinese rain tree	Naturalised in subtropical Qld near Brisbane and Noosa to NSW
Lachenalia reflexa	lachenalia	Known from southern WA
Lagarosiphon major	**oxygen weed**	**All previous records are believed to have been eradicated; however, Tasmania is within its potential distribution range.** **Declared Weed**
Nassella charruana	**uruguay needle grass**	**Known from a few small infestations on the northern outskirts of Melbourne. Potential distribution includes north-eastern Tasmania.** **Declared Weed**

Species	Common Name	Information
Nassella hyalina	**cane needle grass**	**Major infestations occur near Melbourne and central Victoria. Potential Distribution is not yet known but is closely related to serrated tussock and chilean needle grass, care should be taken in Tasmania** **Declared Weed**
Pelargonium alchemilloides	pelargonium	Very localised in south-western Australia
Pereskia aculeata	leaf cactus	Known from scattered sites in coastal south-eastern QLD and NSW. Potential is in sub tropical riparian vegetation
Piptochaetium montevidense	uruguayuan rice grass	Naturalised at CherryLake, southern Victoria. Tasmania not thought to be within potential distribution range
Praxelis clematidea	praxelis	Known from central and northern QLD
Retama raetam	white weeping broom	Naturalised in SA.
Senecio glastifolius	**holly leaves senecio, pink ragwort**	**Known from WA and central NSW. Is a serious weed of New Zealand.** **Declared Weed**
Senegalia catechu	cutch tree	A weed of the Northern Territory. Prefers tropical and subtropical climates.
Thunbergia laurifolia	laurel clock vine	A weed of tropical and subtropical regions in QLD
Tipuana tipu	pride of Bolivia, tipuana	Invasive in north eastern NSW and QLD. Widely planted tree around Australia.
Trianoptiles solitaria	subterranean cape sedge	Only known from one site in a suburb of Melbourne
Vachellia karroo	**karoo thorn**	**Not known from Tasmania but has considerable potential to become a troublesome weed across a large portion of southern Australia.**

APPENDIX 7 – SOUTHERN REGIONAL HIGH PRIORITY WEEDS

BOTANICAL NAME	COMMON NAMES
Asparagus asparagoides	bridal creeper
Asparagus scandens	asparagus fern, climbing asparagus
Hieracium species	hawkweed, orange hawkweed, mouse-ear hawkweed
Salix cinerea	grey willow, wild pussy willow (seeding willows)
Equisetum species	horsetails
Nassella trichotoma	serrated tussock
Rorippa sylvestris	creeping yellowcress
Calluna vulgaris	heather, ling, scots heather
Amaranthus albus	tumble weed, white pigface
Cortaderia species	pampas grasses
Amelichloa caudata	espartillo
Fallopia japonica	Japanese knotweed
Hypericum perforatum	st John's wort
Hypericum tetrapterum	square stemmed st John's wort
Onopordum species	onopordum thistles
Carduus nutans	nodding thistle
Carthamus lanatus	saffron thistle
Coprosma robusta	karamu
Echium plantagineum	paterson's curse
Echium vulgare	viper's bugloss
Eragrostis curvula	african lovegrass
Pennisetum macrourum	african feathergrass
Pennisetum villosum	feathertop
Solanum triflorum	cut leaf nightshade
Senecio jacobaea	ragwort
Leycesteria Formosa	himalayan honeysuckle, elisha's tears
Urospermum dalechampii	mediterranean daisy
Lycium ferocissimum	african boxthorn
Erica lusitanica	spanish heath
Amsinckia species	yellow burr weed, amsinckia

**Note this list was created for the 2008 Southern weed mapping project and therefore some weeds are not necessarily a priority within the Kingborough Municipality

APPENDIX 8 – FULL RECORD OF WEEDS RECORDED IN THE MUNICIPALITY.

Species name	Common names
Acacia baileyana	cootamundra wattle
Acacia decurrens	green wattle
Acacia howittii	sticky wattle
Acacia pravissima	ovens wattle
Acacia provincialis	swamp wirilda or perennial wattle
Acacia pycnantha	golden wattle
Acacia retinodes	wirilda
Acanthus mollis	bears breeches
Acetosella vulgaris	sheep sorrel
Achillea millefolium	yarrow
Agapanthus praecox subsp. orientalis	agapanthus
Agrostis capillaris	bentgrass
Agrostis gigantea	redtop bent
Agrostis stolonifera	creeping bent
Aira caryophyllea subsp. caryophyllea	silvery hairgrass
Aira elegantissima	delicate hairgrass
Aira praecox	early hairgrass
Allium triquetrum	triangular garlic
Alopecurus geniculatus	marsh foxtail
Alopecurus pratensis subsp. pratensis	meadow foxtail
Amaranthus powellii	green pigweed
Ammophila arenaria subsp. arenaria	marram grass
Anthemis tinctoria	yellow chamomile
Anthoxanthum odoratum	sweet vernalgrass
Aphanes arvensis	parsley piert
Aponogeton distachyos	cape pondweed
Arabidopsis thaliana	thale cress
Arctium minus	lesser burdock
Arctotheca calendula	capeweed
Arenaria leptoclados	slender sandwort
Arenaria serpyllifolia	thymeleaf sandwort
Arrhenatherum elatius var. bulbosum	bulbous oatgrass
Asparagus asparagoides	bridal creeper
Atriplex hortensis	garden orache
Atriplex prostrata	creeping orache
Avena fatua	wild oat
Barbarea verna	early wintercress
Batrachium trichophyllum	water fennel
Batrachochytrium dendrobatidis	chytrid fungus
Bellis perennis	english daisy

Species name	Common names
Berberis vulgaris	common barberry
Beta vulgaris subsp. maritima	sea beet
Billardiera heterophylla	bluebell creeper
Brassica oleracea	wild cabbage
Brassica sp.	brassica
Briza maxima	greater quaking-grass
Briza minor	lesser quaking-grass
Bromus catharticus	ripgut, brome grass or prairie grass
Bromus diandrus	great brome
Bromus hordeaceus	soft brome
Bromus lithobius	american brome
Buddleja sp.	butterfly bush
Cakile edentula	american searocket
Calandrinia ciliata	fringed redmaids
Calendula arvensis	field marigold
Callistachys lanceolata	greenbush, native willow or wonnich
Callitriche stagnalis	mud waterstarwort
Calluna vulgaris	heather
Capsella bursa-pastoris	shepherds purse
Cardamine hirsuta	hairy bittercress
Carduus nutans	nodding thistle
Carduus pycnocephalus	slender thistle
Carduus tenuiflorus	winged thistle
Carex demissa	drooping sedge
Carex divisa	saltmarsh sedge
Carex divulsa	grey sedge
Carex flacca	blue sedge
Carex ovalis	oval sedge
Carpobrotus edulis	yellow pigface
Carrichtera annua	wardsweed
Cedronella canariensis	canary balm
Centaurea cyanus	cornflower
Centaurium erythraea	common centaury
Cerastium glomeratum	sticky mouse-ear
Cerastium vulgare	mouse-ear chickweed or common mouse-ear
Chamaecytisus palmensis	tree lucerne
Chenopodium album	fat hen
Chenopodium glaucum	pale goosefoot
Chenopodium murale	nettleleaf goosefoot
Chrysanthemoides monilifera	boneseed
Cirsium arvense var. arvense	californian thistle
Cirsium vulgare	spear thistle

Species name	Common names
Clematis vitalba var. vitalba	travellers joy
Conium maculatum	hemlock
Conyza bonariensis	flaxleaf fleabane
Conyza sp.	fleabane
Coprosma repens	mirror bush
Coprosma robusta	karamu
Cordyline australis	cabbage tree
Cortaderia jubata	pink pampas grass
Cortaderia selloana	white pampas grass
Cortaderia sp.	pampas
Cortaderia Sp.	pampas grass
Cotoneaster franchetii	grey cotoneaster
Cotoneaster glaucophyllus var. serotinus	largeleaf cotoneaster
Cotoneaster horizontalis	rock cotoneaster
Cotoneaster pannosus	velvet cotoneaster
Cotoneaster sp.	cotoneaster
Cotoneaster symondsii	himalayan cotoneaster
Cotula coronopifolia	water buttons
Crataegus monogyna	hawthorn
Crepis capillaris	smooth hawksbeard
Crocosmia Xcrocosmiiflora	montbretia
Cupressus macrocarpa	monterey cypress
Cynodon dactylon var. dactylon	couch grass
Cynosurus cristatus	crested dogstail
Cynosurus echinatus	rough dogstail
Cyperus eragrostis	umbrella sedge
Cypress macrocarpa	macrocarpa
Cytisus multiflorus	white spanish broom
Cytisus scoparius	english broom
Dactylis glomerata	cocksfoot
Danthonia decumbens	heath grass
Delairea odorata	cape ivy
Digitalis purpurea	foxglove
Digitaria sanguinalis	summergrass
Dimorphotheca fruticosa	african daisy
Dipsacus fullonum	wild teasel
Echinochloa esculenta	japanese barnyardgrass
Echium candicans	pride of madeira
Echium fastuosum	pride of madeira or tower of jewels
Echium plantagineum	patersons curse
Elytrigia repens	english couch
Epilobium ciliatum	glandular willowherb

Species name	Common names
Epilobium rotundifolium	roundleaf willowherb
Equisetum hyemale	rough horsetail
Eragrostis cilianensis	stinkgrass
Erica aff. willmorei	heath
Erica arborea	tree heath
Erica baccans	berryflower heath
Erica caffra	african heath
Erica holosericea	andromeda heath
Erica lusitanica	spanish heath
Erodium botrys	long heronsbill
Erodium moschatum	musky heronsbill
Escallonia sp.	
Eschscholzia californica	californian poppy
Eucalyptus bridgesiana	apple box
Eucalyptus dumosa	white mallee
Eucalyptus ficifolia	red flowering gum
Eucalyptus grandis	flooded gum
Eucalyptus lehmannii	swamp yate
Euphorbia helioscopia	sun spurge
Euphorbia lathyris	caper spurge
Euphorbia peplus	petty spurge
Euryops sp	euryops sp
Euryops abrotanifolius	winter euryops
Fallopia convolvulus	black bindweed
Festuca arundinacea	tall fescue
Festuca rubra	red fescue
Foeniculum vulgare	fennel
Fuchsia magellanica	fuchsia
Fumaria muralis subsp. muralis	wall fumitory
Fumaria officinalis subsp. officinalis	common fumitory
Galium aparine	cleavers
Galium divaricatum	slender bedstraw
Gastridium ventricosum	nitgrass
Gazania rigens	gazania
Gazania sp.	gazania
Genista monspessulana	montpellier broom
Genista sp. or Cytisus sp.	broom
Genista stenopetala	madeira broom
Geranium dissectum	cutleaf cranesbill
Geranium yeoi	madiera cranesbill
Gladiolus tristis	evening gladiolus
Glyceria declinata	small sweetgrass

Species name	Common names
Glyceria maxima	reed sweetgrass
Grevillea rosmarinifolia	rosemary grevillea
Hedera helix	ivy
Helminthotheca echioides	bristly oxtongue
Hesperantha coccinea	crimson flag
Hibiscus trionum	bladder ketmia
Hieracium aurantiacum subsp. carpathicola	orange hawkweed
Holcus lanatus	yorkshire fog
Hordeum murinum	barley
Hypericum androsaemum	tutsan
Hypochaeris glabra	smooth catsear
Hypochaeris radicata	rough catsear
Ilex aquifolium	holly
Isolepis levynsiana	fan clubsedge
Ixia flexuosa	twisted ixia
Ixia polystachya	variable ixia
Juncus articulatus	jointed rush
Juncus capitatus	capitate rush
Juncus conglomeratus	compact rush
Juncus indescriptus	african rush
Kennedia nigricans	black coralpea
Kennedia rubicunda	dusky coralpea
Kunzea ericoides	kunzea ericoides
Lagurus ovatus	harestail grass
Lathyrus nissolia	grass vetchling
Leontodon saxatilis	hairy hawkbit
Lepidium campestre	field peppercress
Lepidium didymum	lesser swinecress
Lepidium draba	white weed
Lepidium latifolium	perennial peppercress
Leucanthemum vulgare	oxeye daisy
Leucojum aestivum	summer snowflake, snowflake or giant snowflake
Leycesteria formosa	elisha's tears or himalayan honeysuckle
Ligustrum vulgare	privet
Linum bienne	pale flax
Linum catharticum	white flax
Linum trigynum	french flax
Lobularia maritima	sweet alice
Logfia gallica	narrow cudweed
Lolium perenne	perennial ryegrass
Lolium rigidum	wimmera ryegrass
Lonicera japonica	japanese honeysuckle

Species name	Common names
Lotus subbiflorus	hairy birdsfoot-trefoil
Lotus uliginosus	greater birdsfoot-trefoil
Lunaria annua	garden honesty
Lupinus arboreus	tree lupin
Lupinus polyphyllus	russell lupin, lupine or lupin
Luzula campestris	field woodrush
Luzula congesta	clustered woodrush
Luzula multiflora	flowery woodrush
Lycium ferocissimum	african boxthorn
Lysimachia arvensis	common pimpernel or scarlet pimpernel or blue pimpernel
Malus pumila	apple
Malva arborea	tree mallow
Malva nicaeensis	mallow-of-nice
Malva parviflora	smallflower mallow
Malva sylvestris	tall mallow
Marrubium vulgare	horehound
Medicago arabica	spotted medick
Medicago polymorpha	burr medick
Medicago sativa	lucerne
Melilotus indicus	sweet melilot
Mentha pulegium	pennyroyal
Moenchia erecta	erect chickweed
Myosotis discolor	changing forgetmenot
Myosotis sylvatica	garden forgetmenot
Myriophyllum crispatum	upright watermilfoil
Nasturtium officinale	two-row watercress
Navarretia squarrosa	skunkweed
Oenothera stricta subsp. stricta	fragrant evening-primrose
Orobanche minor	lesser broomrape
Oxalis corniculata subsp. corniculata	yellow woodsorrel
Papaver rhoeas	field poppy
Papaver somniferum subsp. somniferum	opium poppy
Parapholis incurva	coast barbgrass
Paraserianthes lophantha subsp. lophantha	cape leeuwin wattle
Parentucellia latifolia	broadleaf glandweed
Parentucellia viscosa	yellow glandweed
Parietaria judaica	wall pellitory
Paspalum dilatatum	paspalum
Passiflora tarminiana	banana passionfruit
Pelargonium alchemilloides	pelargonium
Pennisetum macrourum	african feather grass

Species name	Common names
Pentaglottis sempervirens	green alkanet
Persicaria maculosa	common knotweed
Petasites pyrenaicus	winter heliotrope
Petrorhagia nanteuilii	proliferous pink
Phacelia tanacetifolia	fiddleneck
Phalaris aquatica	toowoomba canarygrass
Phalaris arundinacea var. arundinacea	reed canarygrass
Phleum pratense subsp. pratense	timothy grass
Phormium tenax	new zealand flax
Photinia glabra	japanese photinia
Physalis peruviana	cape gooseberry
Pilosella aurantiaca subsp. aurantiaca	orange hawkweed
Pinus radiata	radiata pine
Piptatherum miliaceum	rice millet
Pittosporum bicolor x undulatum	hybrid pittosporum
Pittosporum tenuifolium	kohuhu
Pittosporum undulatum	sweet pittosporum
Plantago coronopus	plantain or buck's horn plantain
Plantago lanceolata	ribwort plantain
Plantago major	great plantain
Poa annua	winter grass
Poa bulbosa	bulbous meadowgrass
Poa infirma	early meadowgrass
Poa pratensis	kentucky bluegrass
Poa trivialis	rough meadowgrass
Polygala myrtifolia	myrtleleaf milkwort
Polygonum arenastrum	small wireweed
Polygonum aviculare	creeping wireweed
Polypogon monspeliensis	annual beardgrass
Polyscias sambucifolia	elderberry panax
Populus alba	white poplar
Populus nigra	cottonwood, black poplar, lombardy poplar, aspen or poplar
Potentilla anglica	trailing cinquefoil
Prunella laciniata	cutleaf selfheal
Prunella vulgaris	selfheal
Prunus laurocerasus	cherry laurel
Psoralea pinnata	blue butterfly bush
Pyracantha	fire thorn
Pyrus communis	common pear or pear
Quercus robur	common oak, pedunculate oak, english oak or oak
Ranunculus acris subsp. acris	meadow buttercup

Species name	Common names
Ranunculus parviflorus	smallflower buttercup
Ranunculus repens	creeping buttercup
Raphanus maritimus	sea radish
Raphanus raphanistrum	wild radish
Rapistrum rugosum	giant mustard
Reseda luteola	weld
Rhododendron ponticum	rhododendron
Ribes sanguineum	flowering currant
Romulea rosea var. australis	lilac oniongrass
Rorippa palustris	marsh yellowcress
Rorippa sylvestris	creeping yellowcress
Rosa rubiginosa	sweet briar
Rosa sp.	wild rose
Rubus anglocandicans	blackberry
Rubus fruticosus	blackberry
Rubus sp. Tasmania	blackberry
Rumex crispus	curled dock
Rumex pulcher subsp. pulcher	fiddle dock
Rumex sp.	dock
Rytidosperma fulvum	roadside wallaby grass
Sagina apetala	annual pearlwort
Sagina procumbens	spreading pearlwort
Salix cinerea	grey sallow, grey willow or wild pussy willow
Salix fragilis	crack willow
Salix matsudana	sallow willow
Salix sp.	willow
Salix x calodendron	shrub willow
Salix x fragilis nothovar. fragilis	crack willow
Salix x pendulina var. pendulina	weeping willow
Salix x reichardtii	pussy willow
Sambucus nigra	black elderberry
Schinus terebinthifolius	broad-leaved pepper tree
Scilla peruviana	cuban lily
Secale cereale	rye
Securigera varia	crown vetch
Sedum rupestre	reflexed stonecrop
Senecio angulatus	scrambling groundsel
Senecio elegans	purple groundsel
Senecio jacobaea	ragwort
Senecio vulgaris	common groundsel
Setaria italica	italian millet
Setaria verticillata	whorled pigeongrass

Species name	Common names
Silene coronaria	rose campion
Silene gallica	french catchfly
Silene vulgaris	bladder campion
Silybum marianum	variegated thistle
Sinapis arvensis	charlock
Sisymbrium officinale	hedge-mustard
Sisymbrium orientale	indian hedge-mustard
Sisyrinchium iridifolium	blue pigroot
Solanum nigrum	blackberry nightshade
Solanum physalifolium var. nitidibaccatum	cherry nightshade
Soliva sessilis	winged jo-jo
Sonchus asper	rough sowthistle or prickly sowthistle
Sonchus oleraceus	common sowthistle
Sparaxis bulbifera	harlequin flower
Spergula arvensis	corn spurrey
Spergularia marina	lesser seaspurrey
Spergularia rubra	greater sandspurrey
Stachys arvensis	field woundwort
Stellaria media	garden chickweed
Tanacetum parthenium	feverfew
Taraxacum officinale	common dandelion
Tradescantia	spiderwort
Trifolium campestre	hop clover
Trifolium dubium	suckling clover
Trifolium fragiferum	strawberry clover
Trifolium glomeratum	cluster clover
Trifolium incarnatum	crimson clover
Trifolium pratense	red clover
Trifolium repens	white clover
Trifolium scabrum	rough clover
Trifolium sp.	clover species
Trifolium subterraneum	subterranean clover
Trifolium tomentosum	woolly clover
Triticum aestivum	wheat
Tropaeolum majus	indian cress, garden nasturtium or nasturtium
Typha latifolia	cumbungi
Ulex europaeus	gorse
Ulmus x hollandica	elm, hybrid elm or dutch elm
Undaria pinnatifida	algae
Urospermum dalechampii	mediterranean daisy
Urtica urens	stinging nettle
Valerianella eriocarpa	italian cornsalad

Species name	Common names
Vellereophyton dealbatum	white cudweed
Verbascum blattaria	moth mullein
Verbascum sp.	mullein
Veronica arvensis	wall speedwell
Veronica persica	persian speedwell
Veronica serpyllifolia	thyme speedwell
Vicia hirsuta	hairy vetch
Vicia sativa	spring vetch, vetch, common vetch or tare
Vicia sativa subsp. nigra	narrowleaf vetch
Vicia sativa subsp. sativa	common vetch
Vicia tetrasperma	smooth vetch
Vinca major	blue periwinkle
Vulpia bromoides	squirreltail fescue
Vulpia myuros	rat's tail fescue or fox tail fescue
Vulpia myuros f. myuros	ratstail fescue
Watsonia meriana	watsonia or wild watsonia
Watsonia meriana var. bulbillifera	bulbil watsonia

APPENDIX 9 – DECLARED WEED MAPPING WITHIN MUNICIPALITY

.

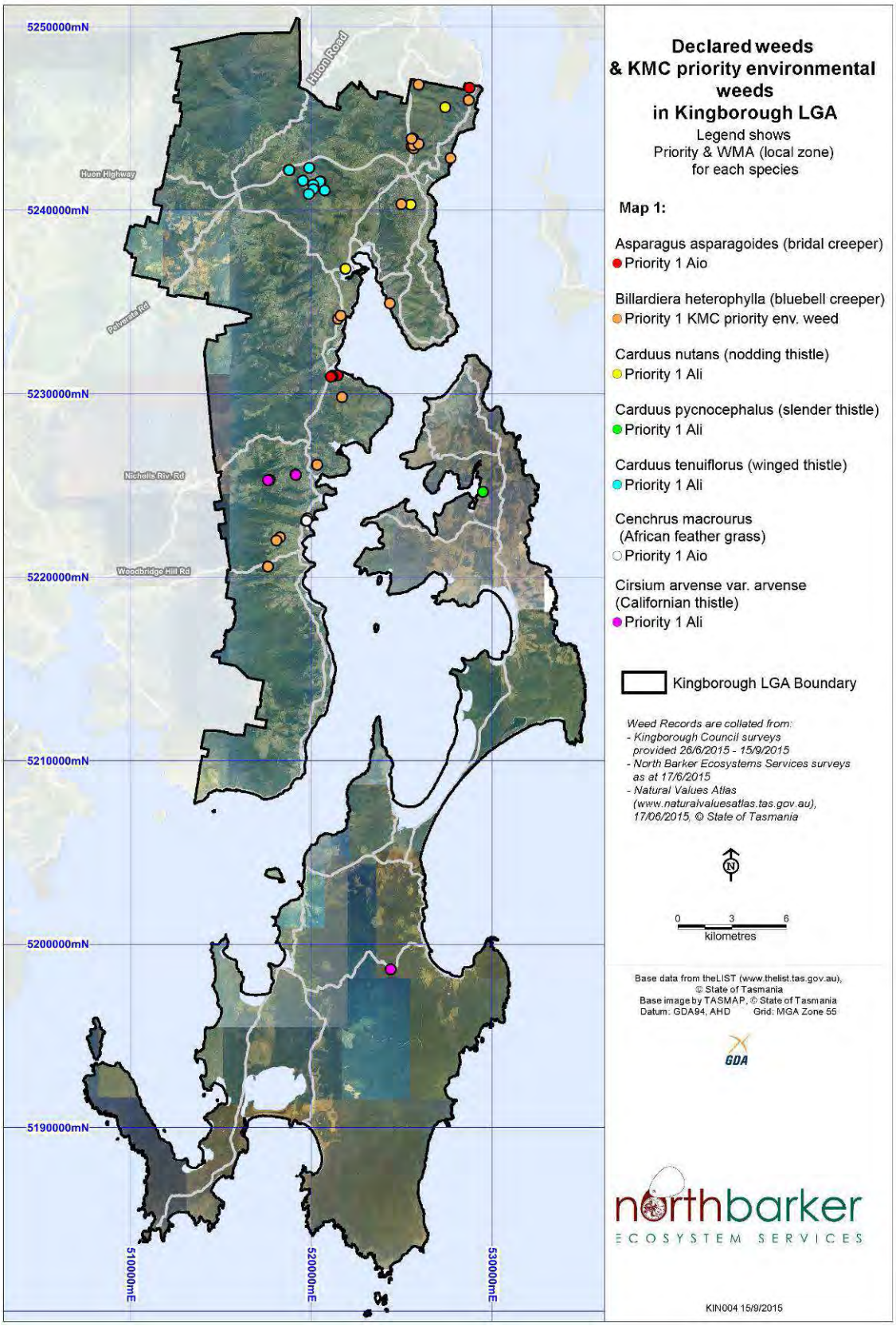


Figure 14 –Declared weeds within Kingborough (Map 1 of 15)

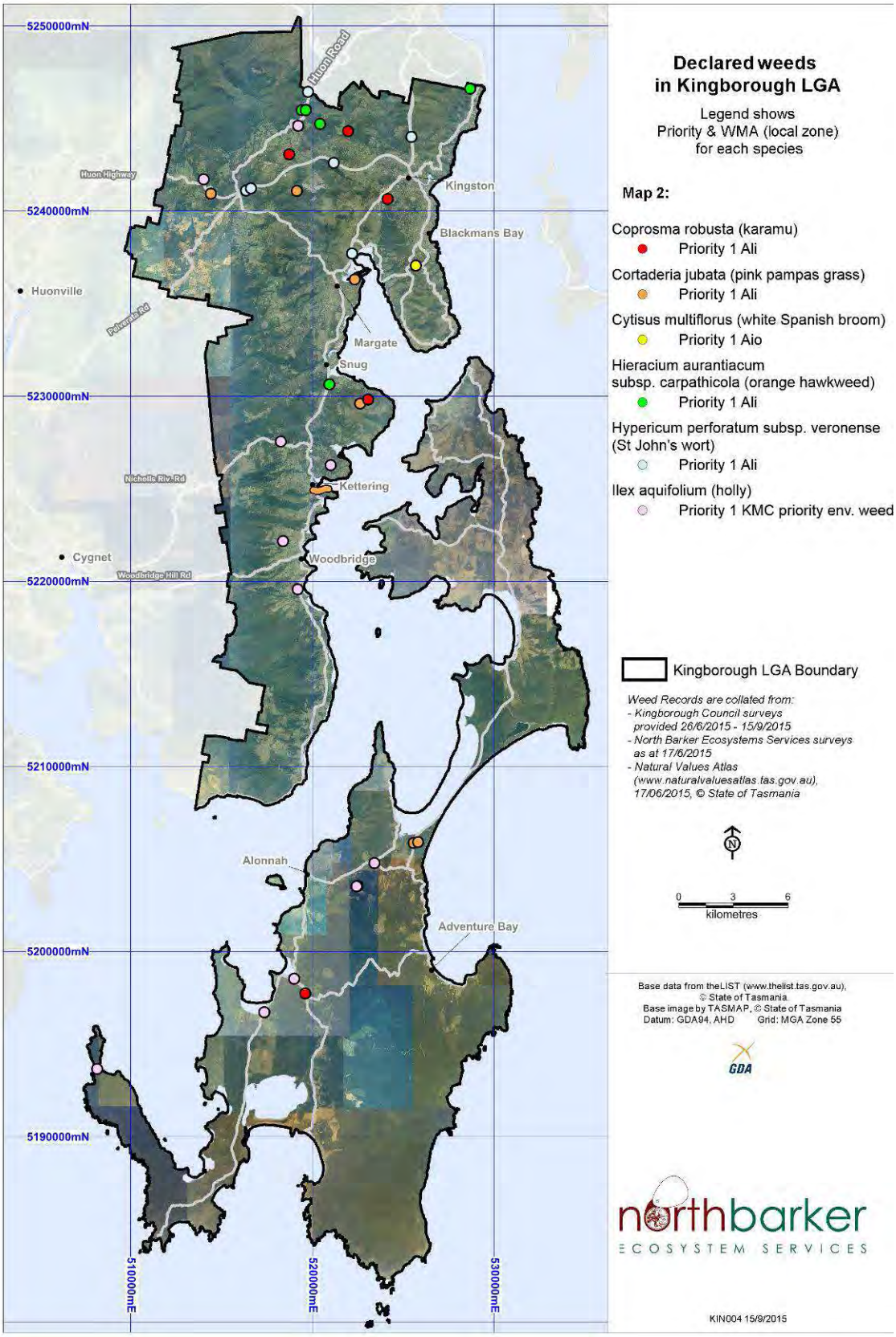


Figure 15 – Declared weeds within Kingborough LGA (Map 2 of 15)

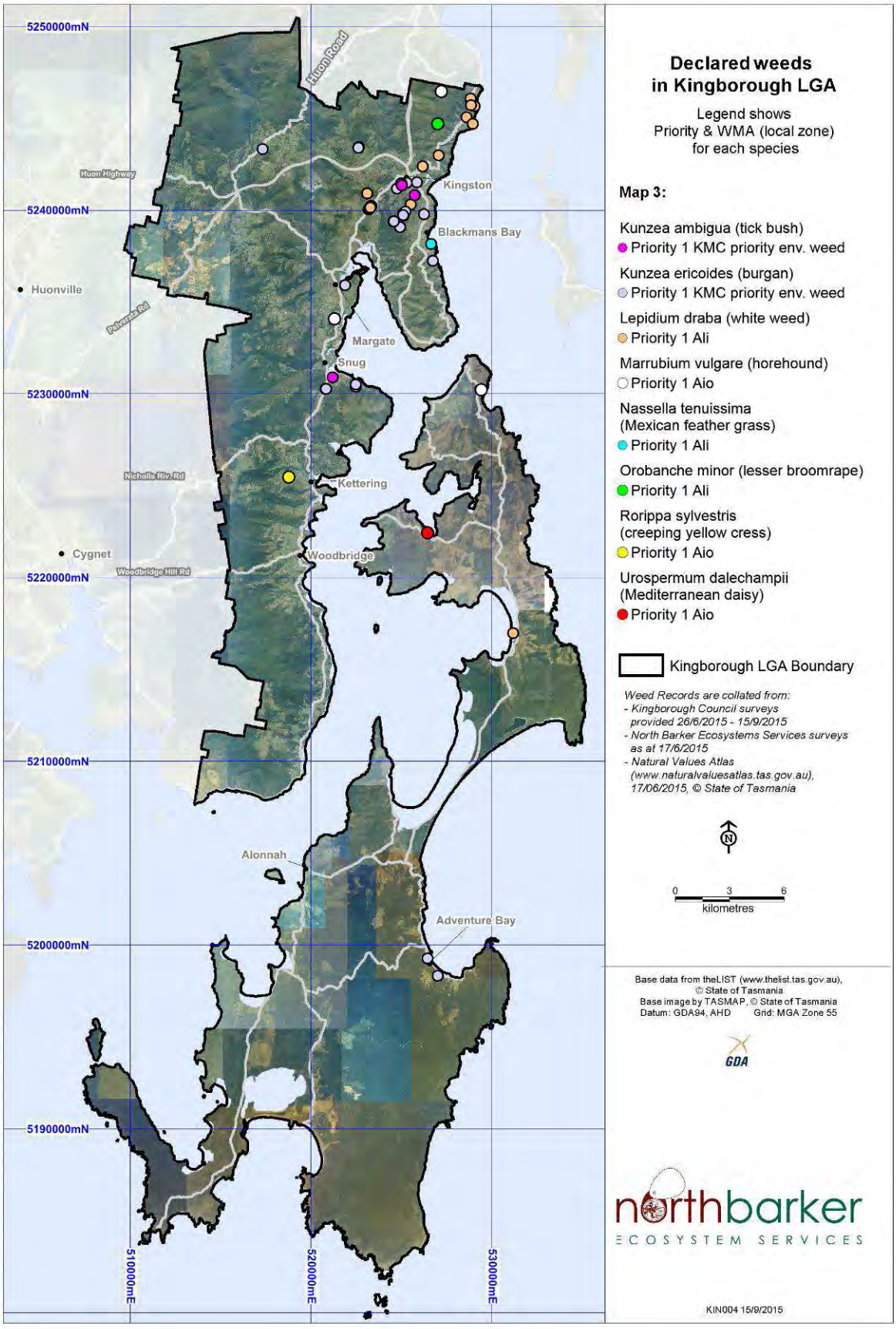


Figure 16 - Declared weeds within Kingborough LGA (Map 3 of 15)

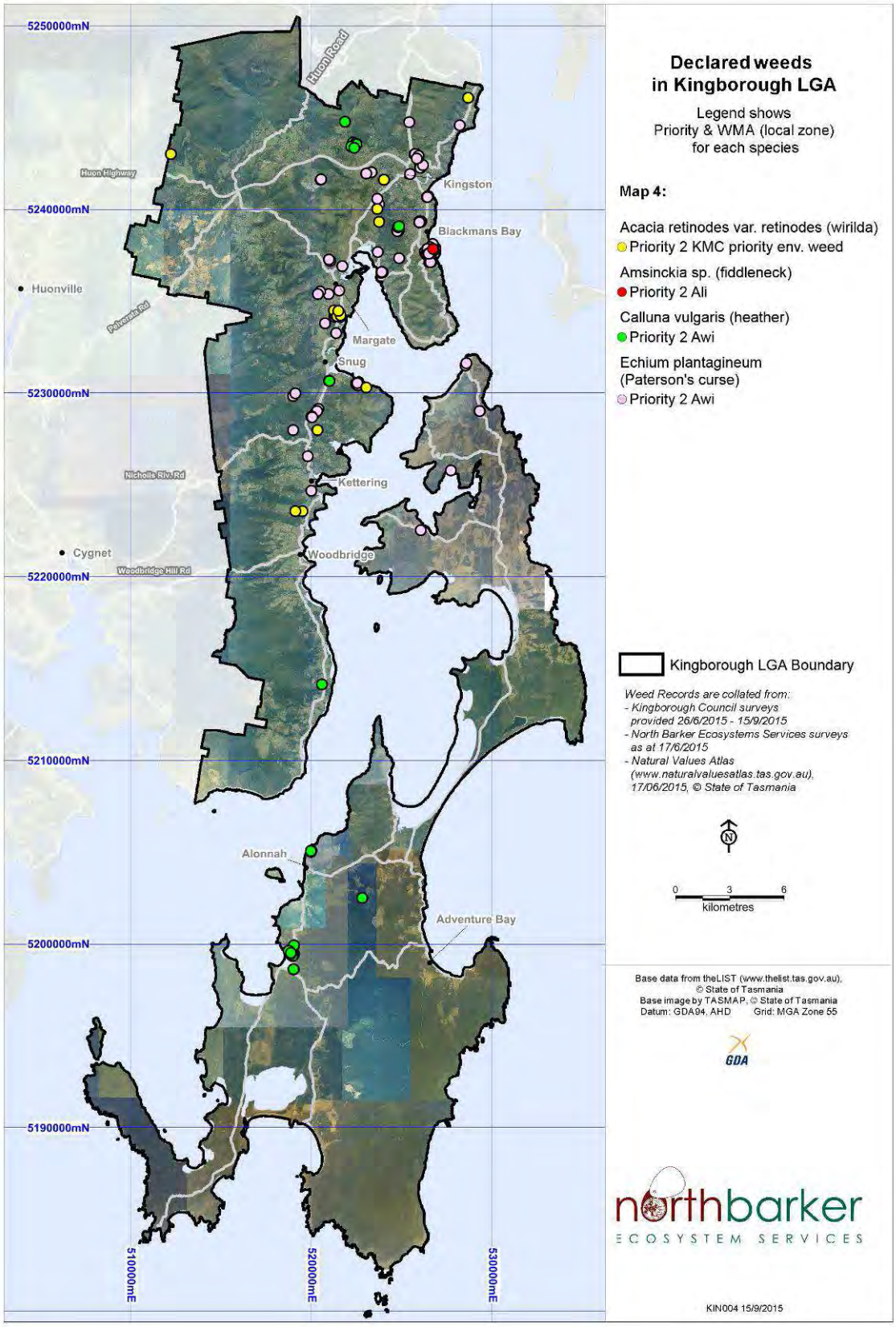


Figure 17 - Declared weeds within Kingborough LGA (Map 4 of 15)

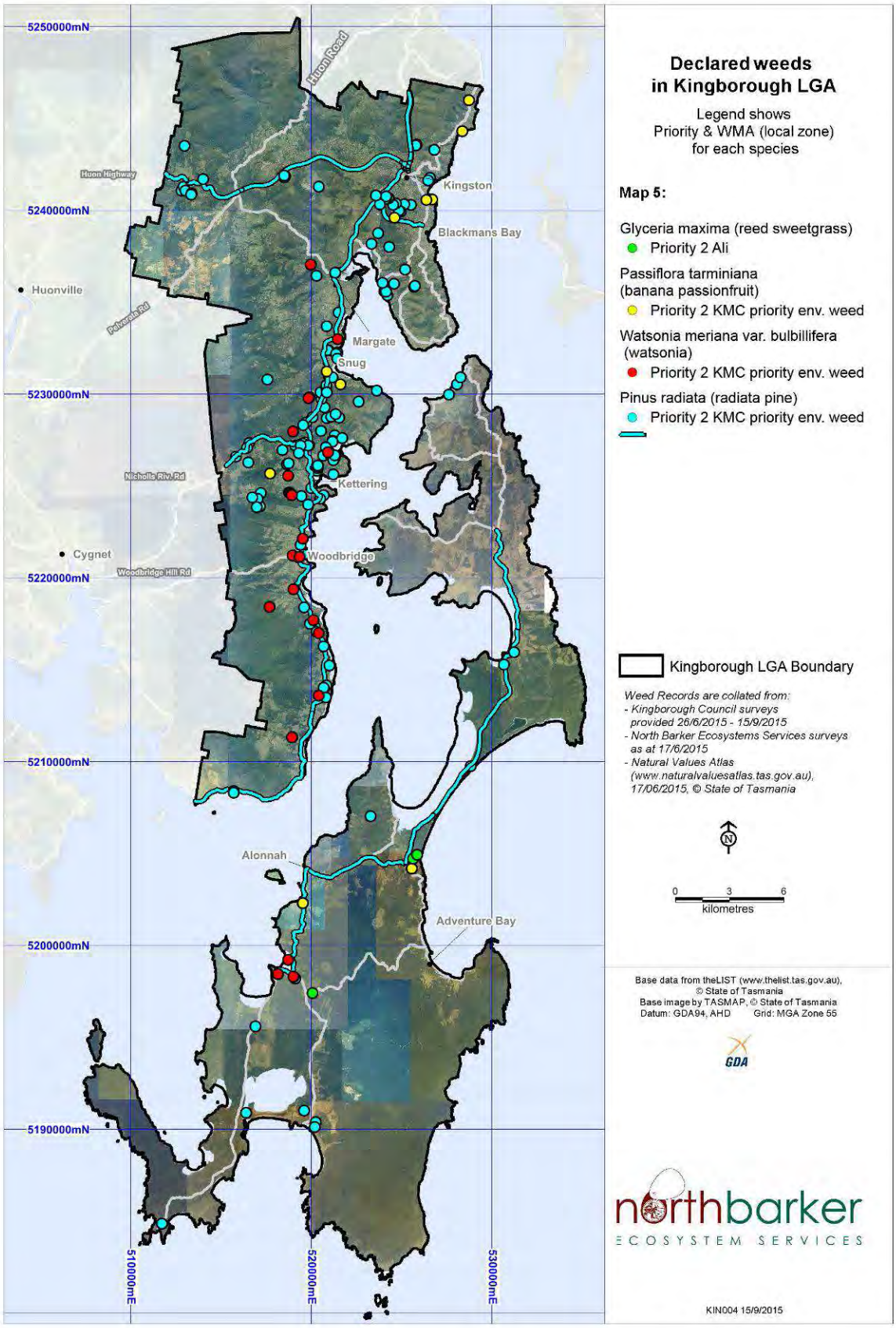


Figure 18 - Declared weeds within Kingborough LGA (Map 5 of 15)

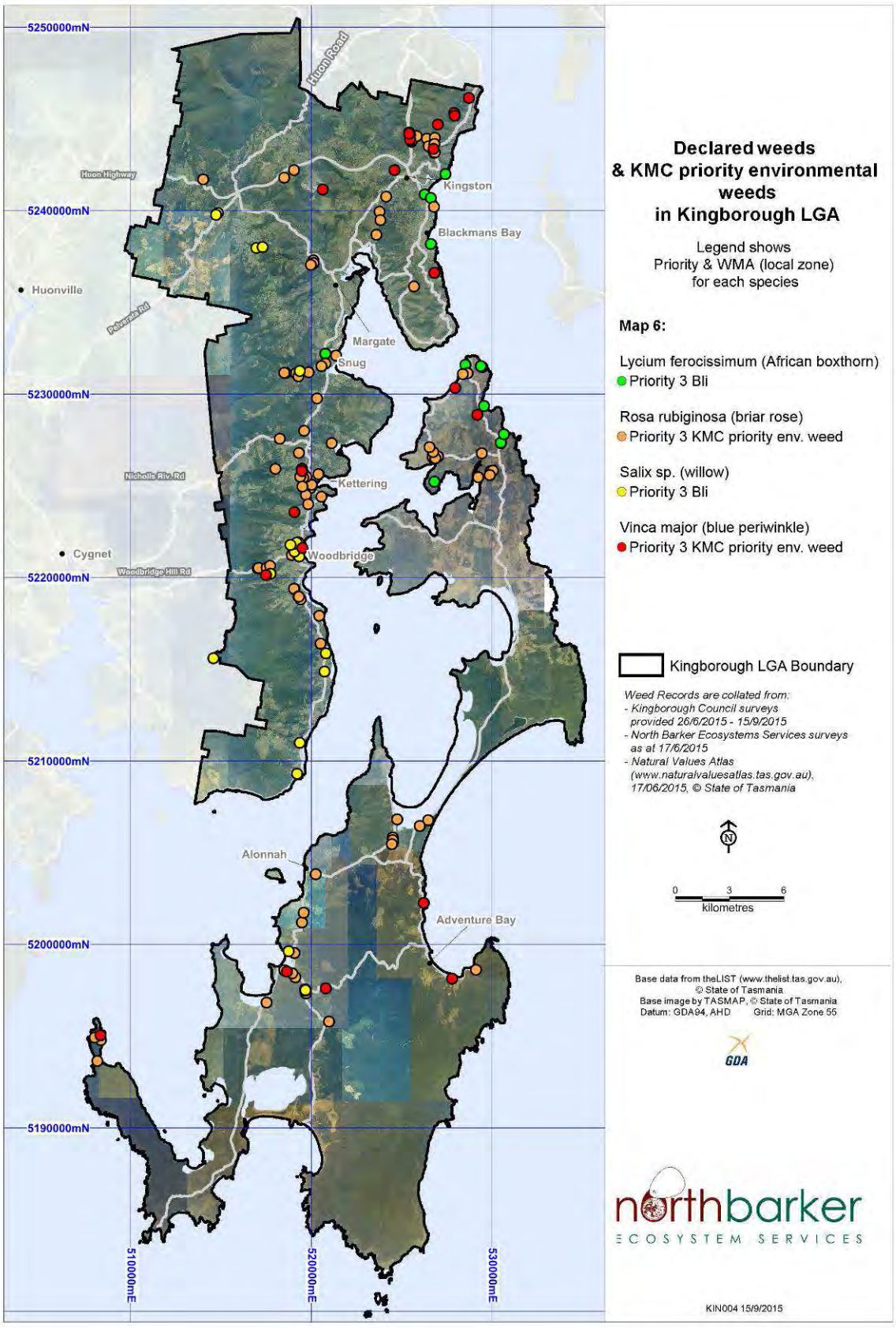


Figure 19 - Declared weeds within Kingborough LGA (Map 6 of 15)

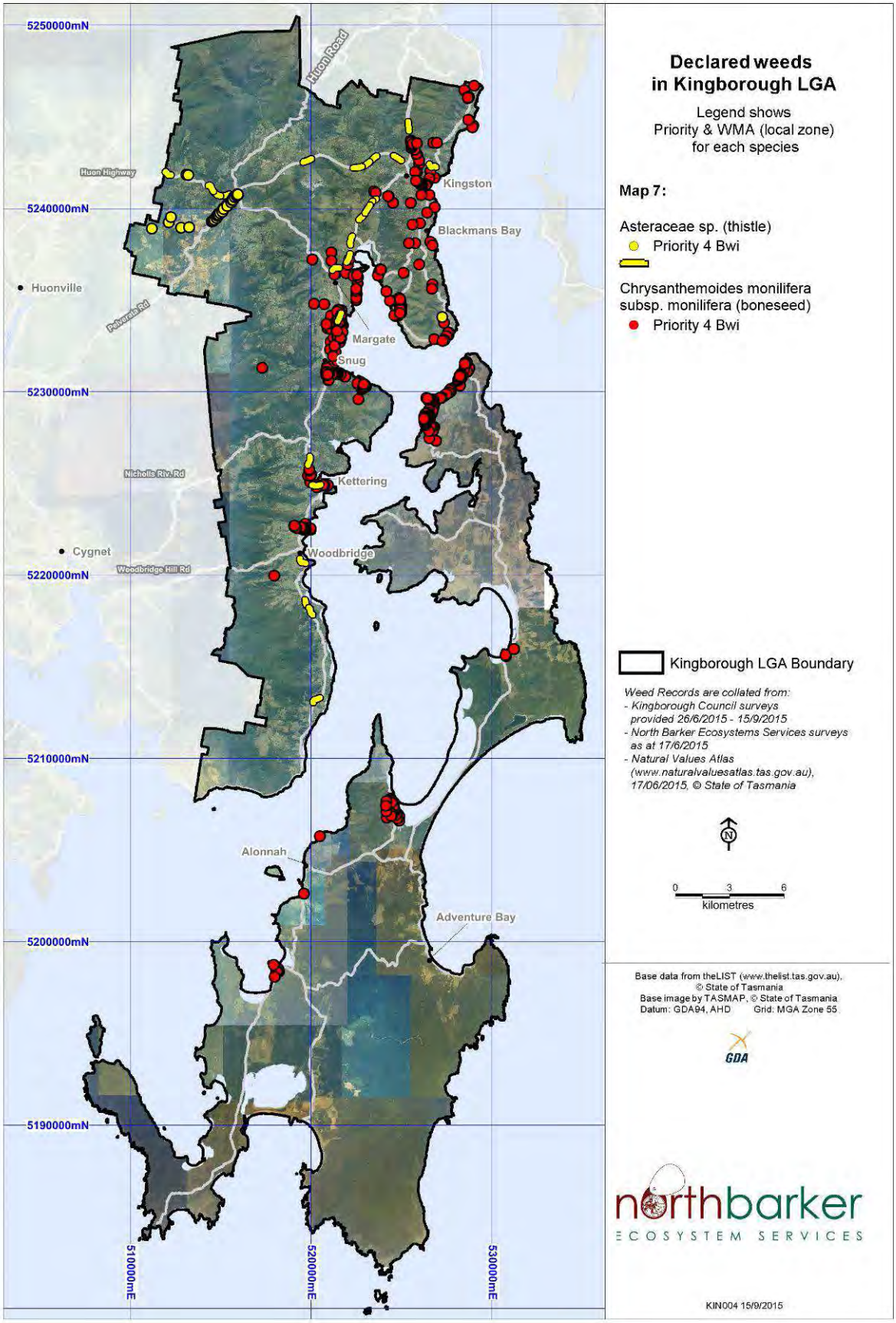


Figure 20 - Declared weeds within Kingborough LGA (Map 7 of 15)

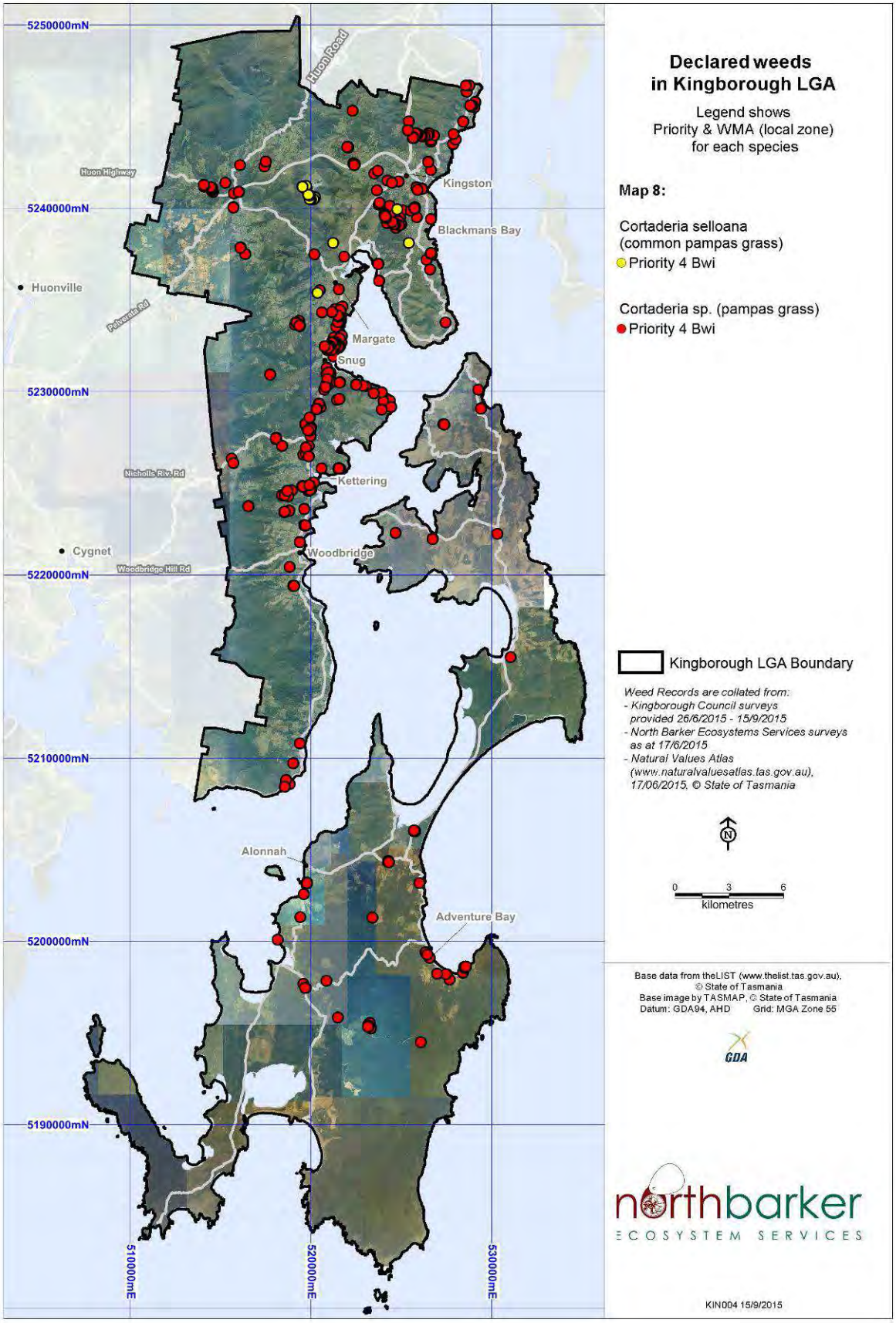


Figure 21 - Declared weeds within Kingborough LGA (Map 8 of 15)

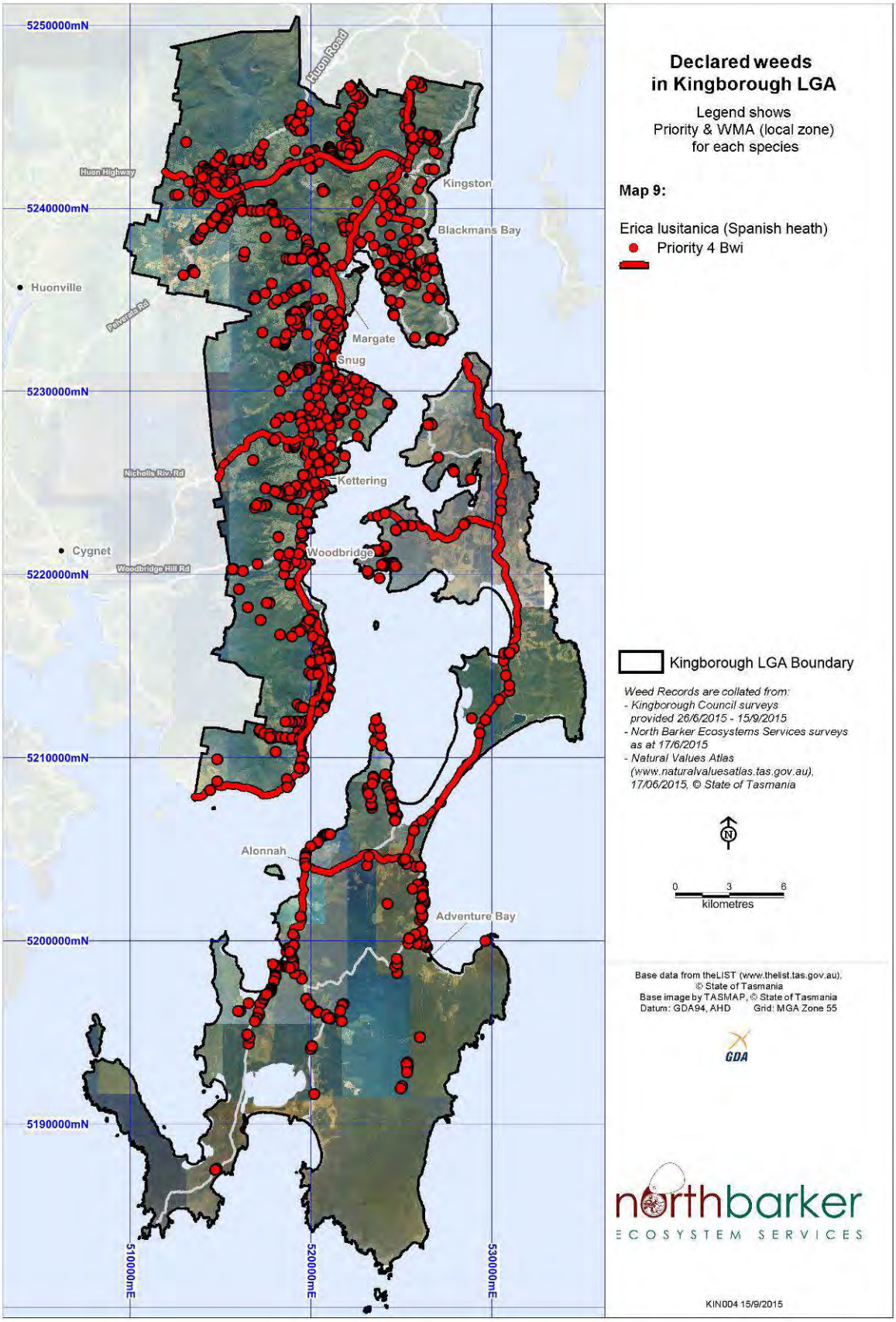


Figure 22 - Declared weeds within Kingborough LGA (Map 9 of 15)

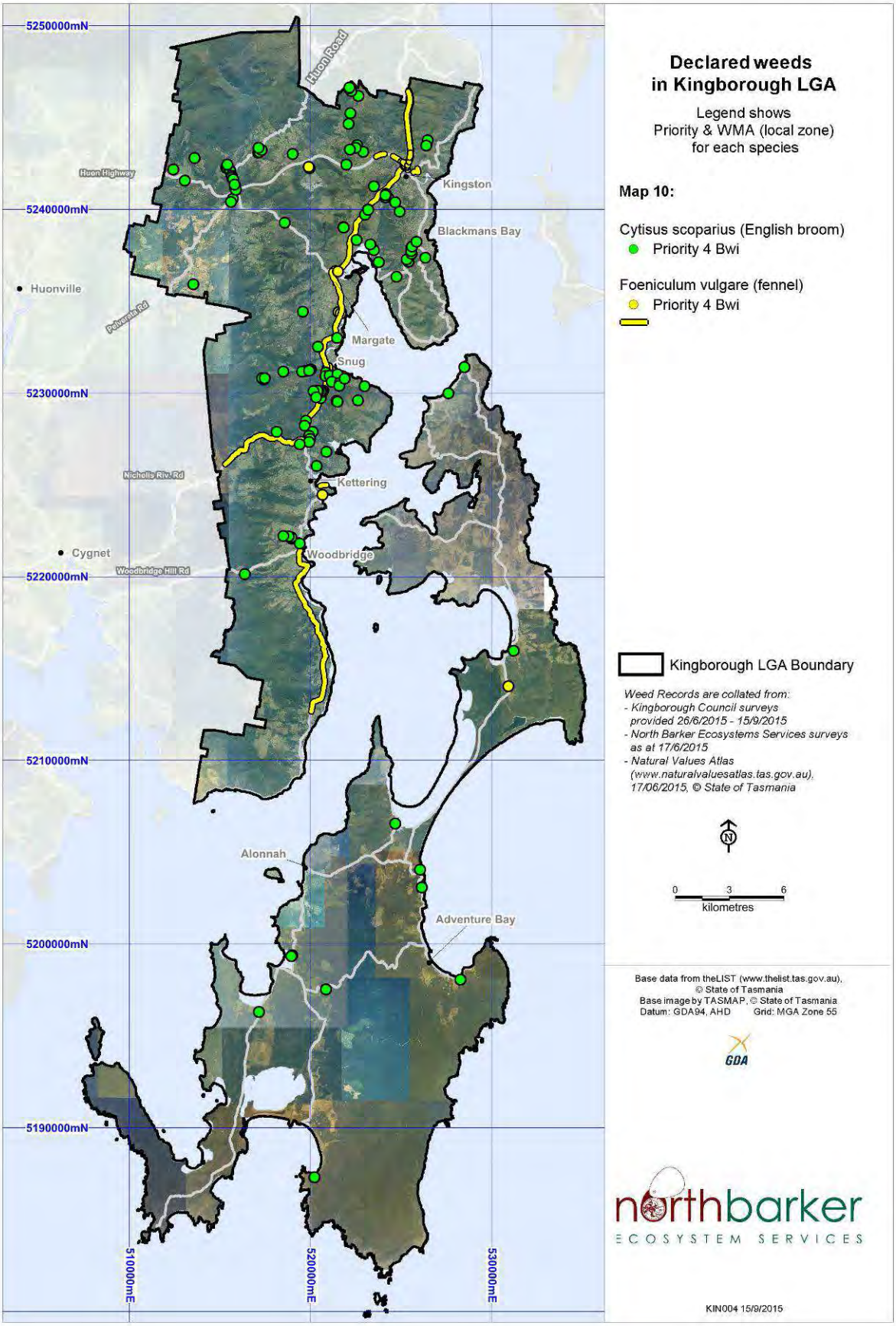


Figure 23- Declared weeds within Kingborough LGA (Map 10 of 15)

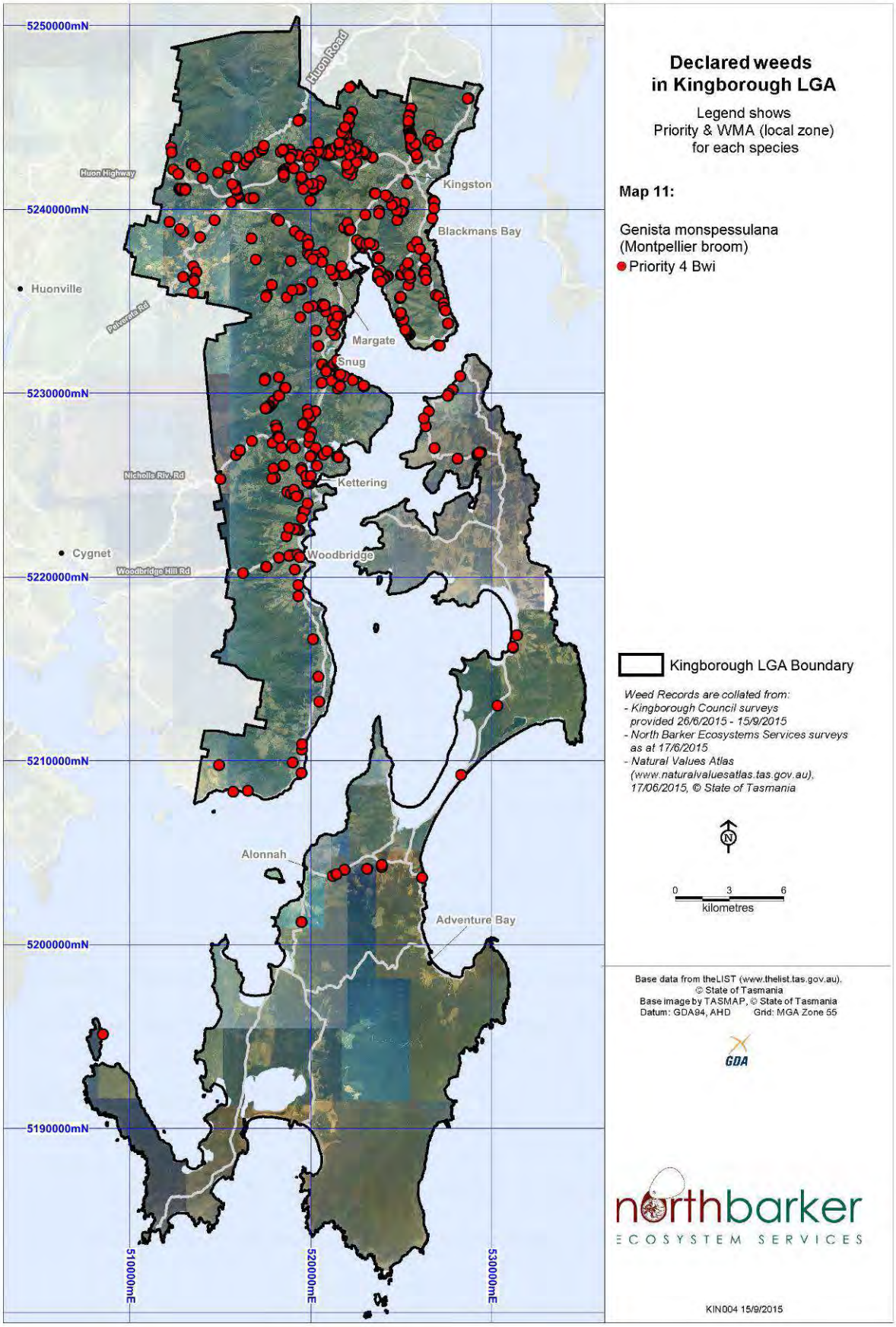


Figure 24 - Declared weeds within Kingborough LGA (Map 11 of 15)

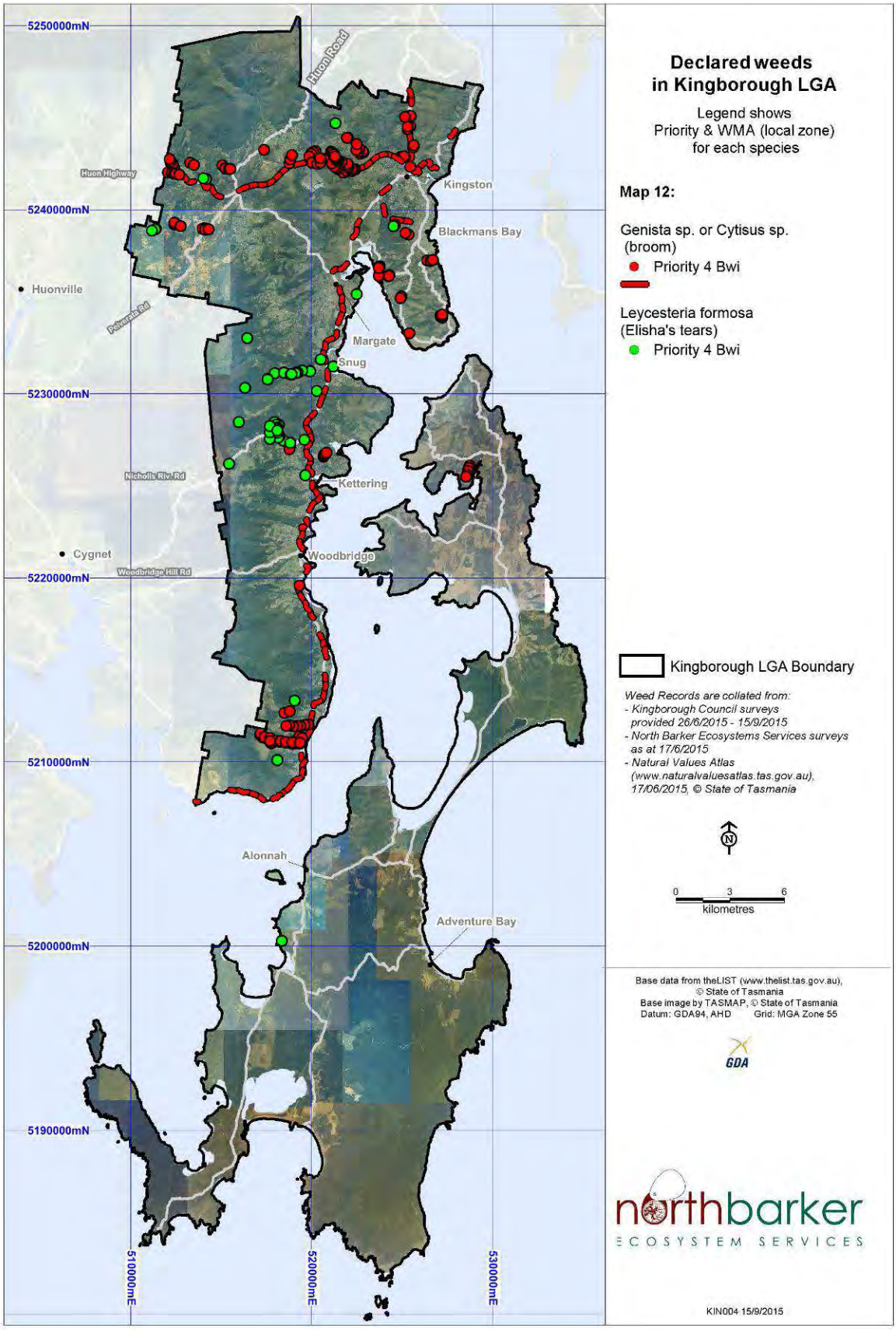


Figure 25 - Declared weeds within Kingborough LGA (Map 12 of 15)

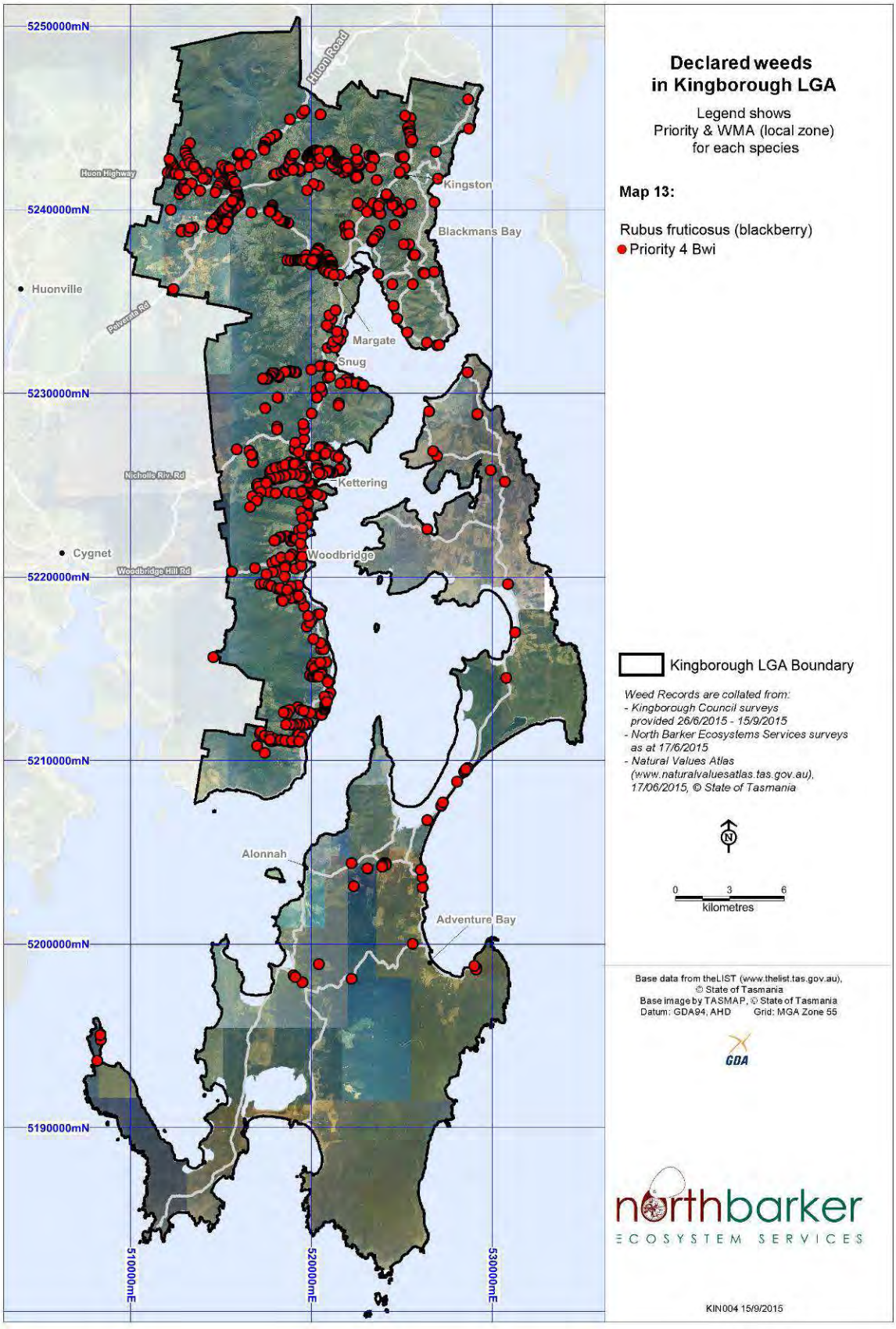


Figure 26 - Declared weeds within Kingborough LGA (Map 13 of 15)

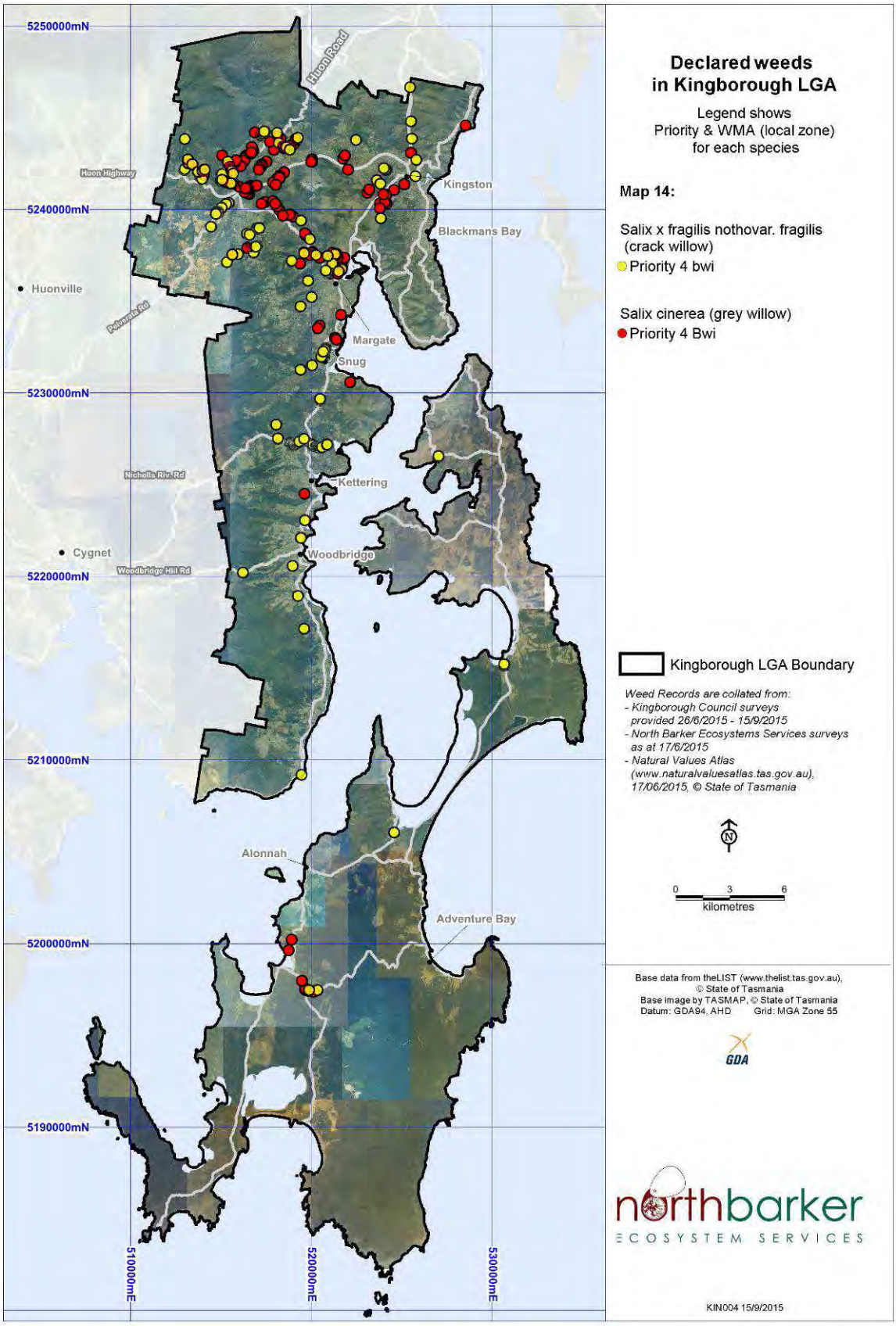


Figure 27 - Declared weeds within Kingborough LGA (Map 14 of 15)

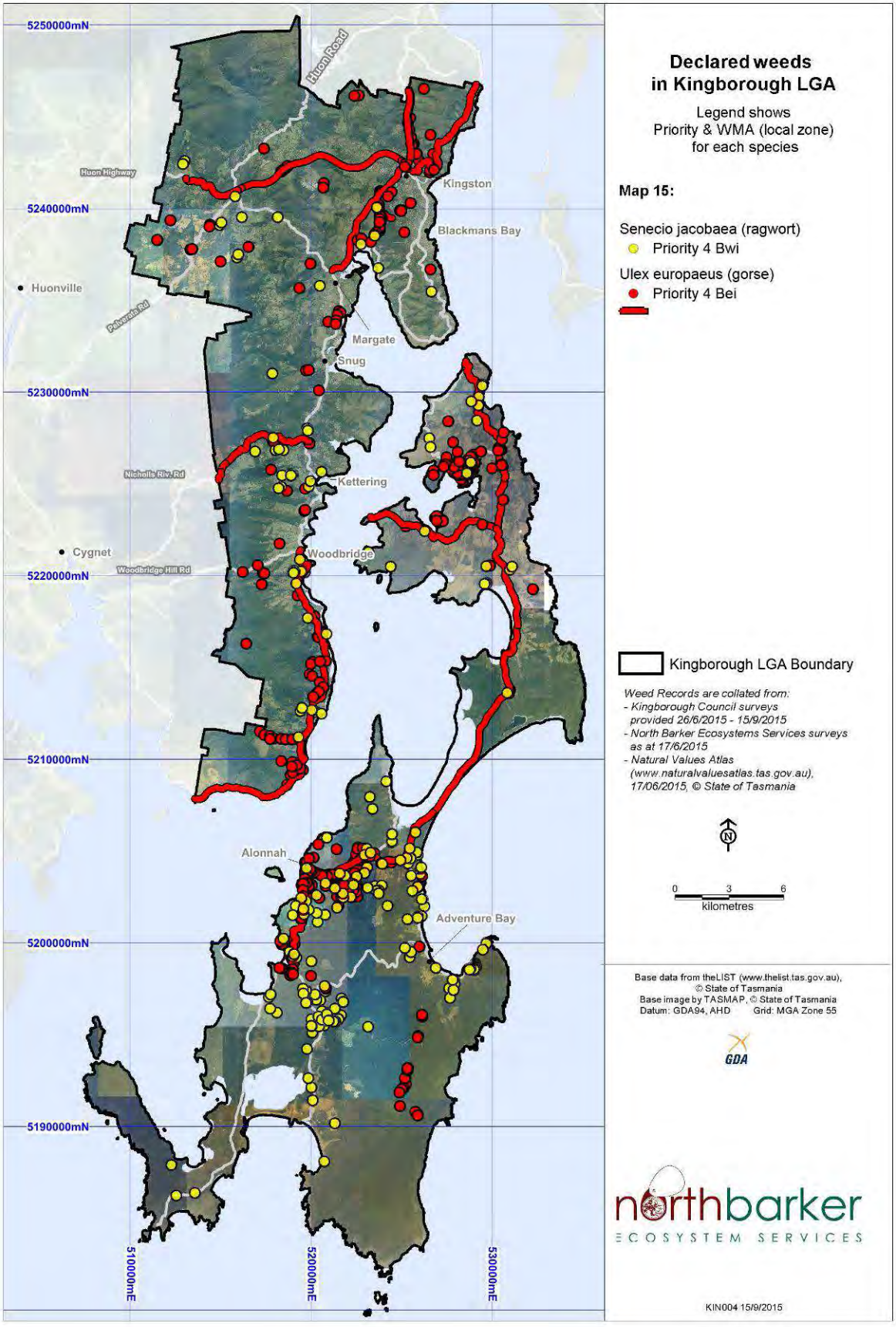


Figure 28 - Declared weeds within Kingborough LGA (Map 15 of 15)

APPENDIX 10 - TEN YEAR KINGBOROUGH WEED STRATEGY ACTION PLAN

PLANK	SECTION	ACTION	RESPONSIBI - LITY	TIMING	PERFORMANCE MEASURE	COST	PRIORITY
	Plank 1 – Best Practice Management						
1	6.1	Review the Kingborough weed management operation	KC	Within 12 months	A written review of the operations effectiveness, efficiency and compliance with chemcert accreditation and best practice.		H
1	6.1	Develop or source a clear and concise checklist for best practise weed management. Ensure all relevant staff have access to this checklist and understand it. Update checklist with new best practice information when available	KC	Within 12 months	All staff have a check best practice check list		H
	Plank 2 – Integrated Weed Management						
2	6.2	Train all staff in integrated weed management principals and application	Lead: KC with DPIPWE/NRM South	Within 12 months	Have hold competency in IWM		H
2	6.2	Embed IWM into site treatment plan templates	KC Weeds Officer	Within 12 months	Site plans contain IWM strategy	Weed officer role	H
	Plank 3 – Planning						
3	6.3	Develop and utilise a live electronic information management system based on Exponare.	KC GIS	Within 2 years	Utilised and integrated into all weed data management within 2 years		H
3	6.3	Develop a works plan template and a works plan	KC Weeds Officer	Yearly/seasonal	Develop a works plan and utilise	Weed officer role	H

PLANK	SECTION	ACTION	RESPONSIBILITY	TIMING	PERFORMANCE MEASURE	COST	PRIORITY
3	6.3	Develop a site plan template	KC Weeds Officer	Within 12 months	Develop a site plans and implement	Weed officer role and weed crew	H
3	6.3	Embed an early detection strategy into the works plan. Utilise a weed scout.	KC Weeds Officer	Within 12 months then seasonally	Early detection response effective, sites are treated as appropriate (current season/before flowering). Scout contributing to priorities seasonally.	Weed crew	M
	Plank 4 – Risk Management						
4	6.4	1. Ensure all Zone A weeds in Tasmania that are not known from Kingborough are highlighted on weed information outlets (web page, facebook, hard copy). Ensure weed management staff can identify each species. 2. Engage with DPIPWE to ensure that all new nurseries are required to provide a weed risk assessments for all new species that they wish to import to the state.	1. KC with associated groups (ie: SCAT, NRM South, Tas Landcare, Greening Australia) 2. DPIPWE	Ongoing	Participation in Group committees / communication links		H
4	6.4	Develop an early detection and response protocol including, a weed alert network with stakeholders, a rapid response system, a weed risk assessment for new nurseries (in approval conditions), a scout role in monitoring, hygiene conditions in the DA approvals process.	DPIPWE, local Councils, weed officer.	Years 2-4	All elements embedded in Council processes.		H

PLANK	SECTION	ACTION	RESPONSIBI - LITY	TIMING	PERFORMANCE MEASURE	COST	PRIORITY
4	6.4	Identify and focus control on satellites of core infestations (Bradley method). Ensure implementation of best practice hygiene management practices for staff/contractors.	Weed officer	2017	Works plan's reflect core satellite approach		H
4	6.4	All key land managers to follow the Tasmanian Washdown Guidelines for Weed and Disease Control for machinery[8], vehicle and equipment hygiene Contractors to adhere to the above (informed as a condition of approval) Washdown guidelines distributed with DA permits. Encourage the use of commercial car washes for washdown. Investigate distribution of wash down facilities and look to inform of facilities, particularly at key entry points to the municipality. Install wheel wash at Depot and at Barretta Tip.	Weed officer	2016	Car wash bays / wheel wash utilised for washdown		M
4	0	Include Weed Management Zone risk management prescriptions in site treatment plan.	Weed Officer	2016	All Site treatment plans include relevant WMZ risk management prescriptions.		M
4	8	Map roadside weeds and roadside weed free areas using line maps.	Weed staff	2017	All non sub urban Council roads mapped		H
4	9	Categorise Priority 5 weeds using WMAct zone characteristics.	Weed staff	2016	All priority 5 weeds categorised.		L

[8] DPIPWE (2004)

PLANK	SECTION	ACTION	RESPONSIBI - LITY	TIMING	PERFORMANCE MEASURE	COST	PRIORITY
	Plank 5 – Stakeholder Engagement and Partnerships						
5	6.5	Develop rates rebate strategy and inform beneficiaries of responsibilities. Trial a Land Management Incentives Program for private landowners (land > 2 ha) within a defined area of Kingborough to remove and control priority weeds. Incentives will include an 'opt out' rates rebate[9]	KC and Weeds Officer	Within 2 years	Strategy implemented beneficiaries aware of responsibilities. Beneficiaries opt to stay in program	KC staff and Weed officer role	M
5	6.5	Reverse Auction – Establish process	KC staff and weed officer	Within 2 years	Auction once and 10 projects funded.		M
5	6.5	Cooperative Weed Management Agreements	KC staff and weed officer	2-5 years	All partners engaged and at least 1 CWMA operational.	KC staff and Weed officer	M
5	6.5	Coordinated Weed Management	weed officer	2-5 years	All partners engaged and at least 3 coordinated efforts operational.	KC staff and Weed officer	M
5	6.5	Service Agreements	KC staff and weed officer	2-5 years	Service Agreement developed and at least 2 clients engaged.	KC staff and Weed officer	M
5	6.5	Replacement Plant Policy	KC staff and weed officer	Years 1-3 years	Policy ratified and at least 1 year of implementation	KC staff and Weed officer	M
	Plank 6 – Education and Training						
6	6.6	Education – implement a communications strategy focussed on engagement, understanding and interaction using	weed officer	Years 1-4	Web site updated, facebook or other social media utilised. Evidence of the educational	Weed officer	H

[9] For an example see http://www.melton.vic.gov.au/Services/Environment_and_sustainability/Taking_care_of_the_land/Environmental_enhancement_rate_rebate

PLANK	SECTION	ACTION	RESPONSIBILITY	TIMING	PERFORMANCE MEASURE	COST	PRIORITY
		modern media tools.			focus being on understanding		
6	6.6	Implement an initial and biannual training schedule for staff, contractors and regular volunteers.	KC staff and weed officer	Years 2-4	All staff, contractors and regular volunteers have completed initial and first biannual training.	Training courses	H
6	6.6	Training – Prepare and implement a training schedule for all weed managers. Include Chemcert, equipment use, hygiene principles and practicalities, weed identification and control techniques as well as means of finding information.	KC staff and weed officer	Years 2-4	All staff have attended training by 2017	Training courses	H
7	**Monitoring and Review**						
7	6.7	1. Reconsider the relevance of the Strategy 2. Consider progress against the planks and the Action Plan	Weed officer / Council	2025			M
7	6.7	Construct a performance indicator based on the cost of improvement evident in data	Weed officer	2017	All works plans contribute to the PI		M
7	6.7	Audit the adherence to the planning and site treatment plans. Assess the efficacy of the implementation via the using the indicator and a review of the raw site data. Include some compliance auditing of weed management conditions and enforcement for DA's	Consultant	2019	Audit complete and reported		M

APPENDIX 11. RECOMMENDED CONTENTS OF WORK AND SITE PLANS.

Works Plan Content: Develop and utilise a live electronic information management system based on Exponare or equivalent program.

- Budget for period;
- A site reference that identifies the site through planning, implementation and review processes;
- The management aim is identified – for example: eradication, control, program management;
- Treatment level:
    - Primary
    - Secondary
    - Rehabilitation
    - Monitor and follow up
    - Program treatment (repeated seasonally or regularly)
- Estimated time required this season (hrs/days); and
- Scheduled time (calendar).

Site Treatment Plan Content: Site treatment plan templates must at a minimum include all of the National attributes required for weed mapping**:**

- Site reference
- Tenure
- Scheduled treatment date (month)
- Zone/limitations
- Location (GPS)

- Predominant weed(s)
- Area of weed(s) present (m^2/ ha)
- Cover of predominant weed(s) (Braun-Blanquet)
- Area treated (m^2 / ha)
- Time to implement treatment (person hrs)
- Source of data/ name of collector
- Management aim:
    - Eradicate
    - Contain
    - Programed control
- Treatment proposed:
    - Spray herbicide
        - Type/rate (from label)
    - Cut and past
    - Physical removal
    - Mow
    - Landscape access (batter or level)
    - Mulch
    - Rehabilitate
- Hygiene measures required
- Monitoring of implementation

- Include a photo point of pre-treatment and initial operations
- Previous treatment plan implemented
- New treatment plan proposed
- Update areas and cover abundance
- Record trend in hours to implement treatment.
- Calculate cost of treatments.