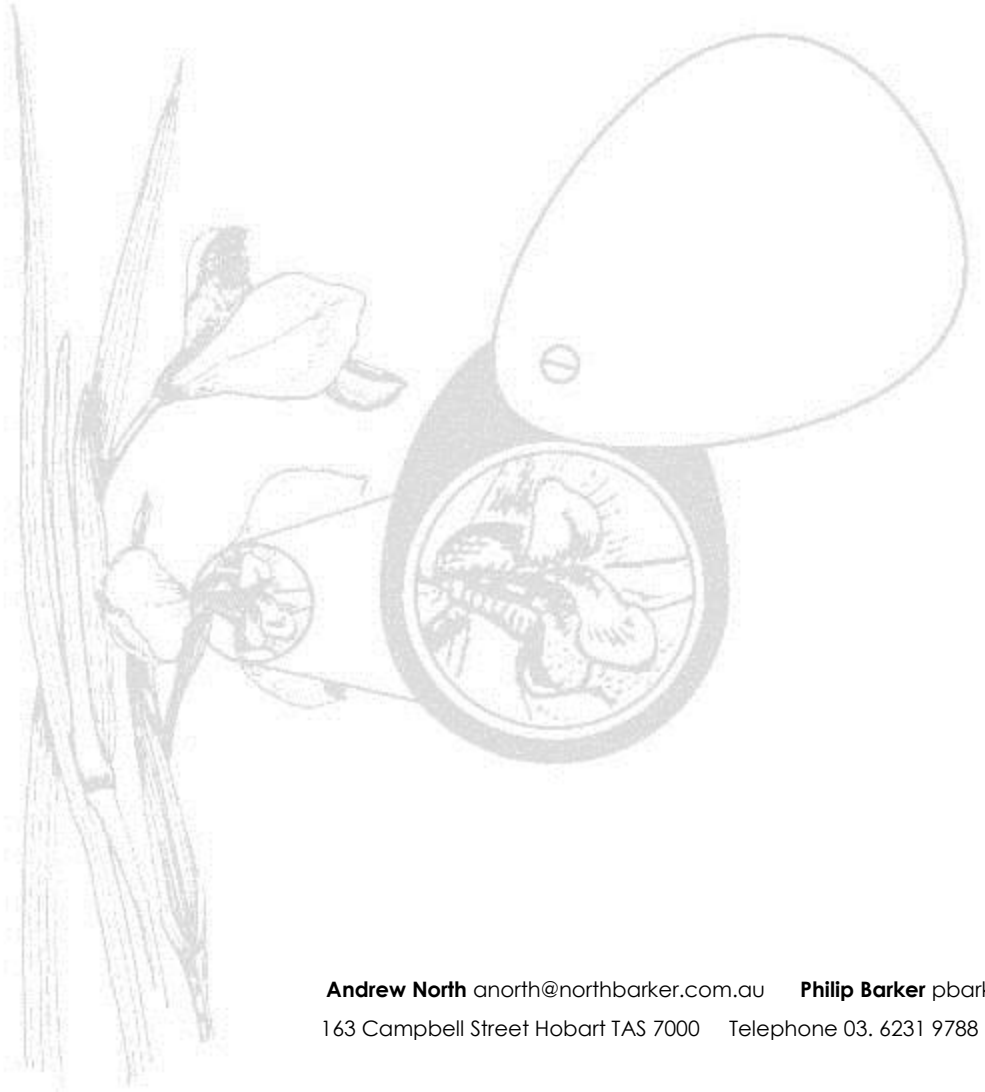
Cape Deslacs Spanish Heath Management Plan

14th January 2013

Version 1.0

For Wildcare Deslacs (WLD001)



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Version Control

This original version of the Cape Deslacs Spanish Heath Management Plan is classified as Version 1.0., dated 14th January 2013. As this is intended to be a live document that will be updated over time as needed, the date and version number should be updated each time additional changes are made. In this way it will remain clear the differences between the original document and later versions, and what has been added by the users of this plan at later dates.

1. INTRODUCTION

Background

Wildcare Deslacs is a community based environmental group formed under the umbrella group of Wildcare Incorporated (Tasmania) in 2008. Its aim is to foster the care and protection of Tasmania's National Parks and other conservation reserves, natural and cultural heritage (on public and private land), focusing on the Cape Deslacs and Clifton Beach area.

The Southern Coastcare Association of Tasmania (SCAT) has funded a range of community groups to progress local priorities for action. In June 2012, consultation with WILDCARE Deslacs identified the need for a management plan to control the invasive species Spanish heath (*Erica lusitanica*) as the priority issue for this group. The funding for this project is from SCAT.

North Barker Ecosystem Services have been contracted to prepare this management plan.

Study Area

The study area for this plan covers the Cape Deslacs Nature Reserve and two adjoining private properties to the north of the reserve. Cape Deslacs Nature Reserve is a Tasmanian Parks & Wildlife Reserve (PWS), proclaimed under the Tasmanian *Nature Conservation Act 2002*[1]. It is situated to the south-east of Hobart on the peninsula commonly known as "South Arm". It is bounded by Clifton Beach to the south, Pipe Clay Lagoon to the north and Frederick Henry Bay to the east (See Figure 1). The study area covers approximately 100 hectares.

Methods

A field survey was undertaken on foot on the 31st October 2012. Whilst the main focus of this plan was on the management of Spanish heath, vegetation communities were re-mapped where necessary and any new threatened species or threatened fauna habitat was recorded. Site-specific descriptions of vegetation communities were not required for this management plan.

Limitations

The distribution of Spanish heath relies upon data supplied by Wildcare Deslacs and whilst all infestations were visited in the field, unless it was obviously incorrect it was not re-recorded. No additional weed species were recorded during the field survey, as the focus was solely on Spanish heath.

[1] Tasmanian Government, 2002

Figure 1: Location of the study area

2. NATURAL VALUES

Vegetation Communities

Vegetation communities were re-mapped where necessary during the field survey to assist in the prioritisation process. Vegetation communities are classified according to TASVEG Version 2[2]. No vegetation communities recorded are listed under the Commonwealth *Environment Protection & Biodiversity Conservation* Act 1999.

The following table (Table 1) lists the communities recorded, their Tasmanian conservation status (under the Tasmanian *Nature Conservation Act 2002*) and their area within the study area. The distribution of these communities is shown on Figure 2.

Table 1 - Vegetation communities within the study area

Tasveg Code	Description	Conservation Status#	Area (ha)
ARS	Saline sedgeland/rushland	-	0.7
ASS	Succulent saline herbland	-	0.5
DAC	*Eucalyptus amygdalina* coastal forest and woodland	-	25.4
DOW	*Eucalyptus ovata* heathy woodland	Threatened	4.1
DTO	*Eucalyptus tenuiramis* forest and woodland on sediments	Threatened	2.1
FAG	Agricultural land	-	10.1
FWU	Weed infestation	-	3.4
NAV	*Allocasuarina verticillata* forest	-	1.0
SAC	*Acacia longifolia* coastal scrub	-	32.0
SCH	Coastal heathland	-	2.3
SRC	Seabird rookery complex	Threatened	10.8
SSC	Coastal Scrub	-	7.2

Threatened Flora

A database search of the Tasmanian Natural Values Atlas[3] found two threatened flora species that have been recorded within the study area. These species are listed in the following table (Table 2).

Neither of these species are listed under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBCA), with both being listed under the Tasmanian *Threatened Species Protection Act 1995* (TSPA). Additional records of one of these species were recorded during the field survey.

Their distributions are shown on figure 2.

Table 2 - Threatened flora within the study area

[2] Harris & Kitchener, 2005

[3] DPIPWE (2012c) Natural Values Atlas, 24th October 2012

Scientific Name	Common Name	Conservation Status (TSPA/EPBCA)*	Previously recorded within study area	Recorded during field survey
Cynoglossum australe	coast houndstongue	(r/-)	Yes	Yes
Cyrtostylis robusta	large gnat-orchid	(r/-)	Yes	-

* - Tasmanian *Threatened Species Protection Act 1995, Commonwealth Environment Protection & Biodiversity Conservation Act 1999*

Threatened or Significant Fauna

A database search of the Tasmanian Natural Values Atlas[4] found one threatened and two significant fauna species that have been recorded within the study area. These species are listed in the following table (Table 3).

The short-tailed shearwater is listed under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBCA) as a marine and migratory species. This species is also listed under two migratory bird agreements - JAMBA (Japan & Australia Migratory Bird Agreement) and ROKAMBA (Republic of Korea & Australia Migratory Bird Agreement). One species is listed under the Tasmanian *Threatened Species Protection Act 1995* (TSPA).

Their distributions are shown on figure 2.

Table 3 - Threatened or significant fauna within the study area

Scientific Name	Common Name	Conservation Status (TSPA/EPBCA)*	Previously recorded within study area	Recorded during field survey
Amelora acontistica	chevron looper moth	(v/-)	Yes	-
Eudyptula minor	little penguin	-	Yes	-
Puffinus tenuirostris	short-tailed shearwater	marine & migratory (JAMBA, ROKAMBA)#	Yes	-

* TSPA - Tasmanian *Threatened Species Protection Act 1995,* v = vulnerable
EPBCA - Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*

- Listed as marine & migratory (not threatened) species under the Commonwealth EPBCA 1999.
JAMBA - Japan-Australia Migratory Bird Agreement
ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement

[4] DPIPWE (2012c) Natural Values Atlas, 24th October 2012

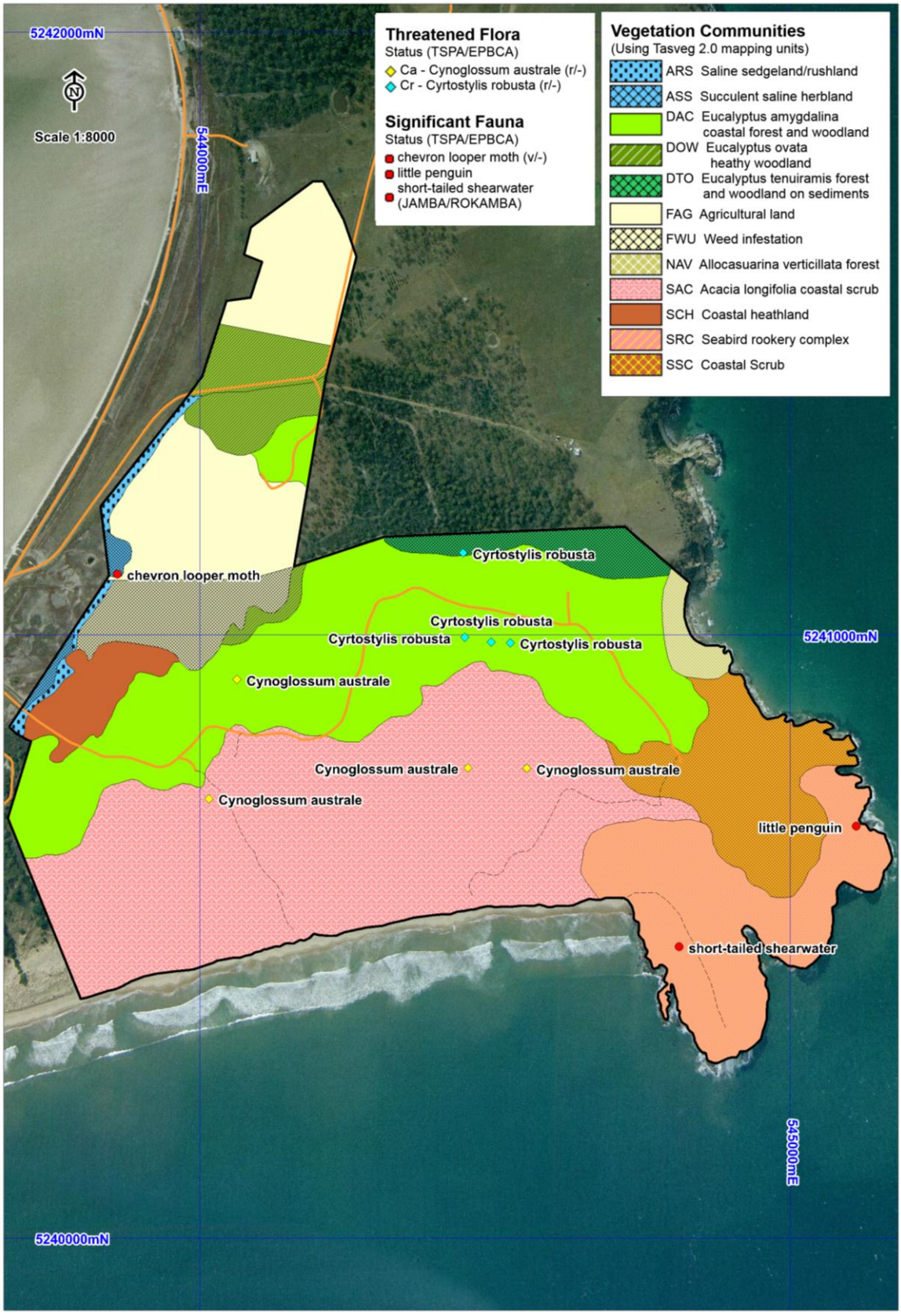

Figure 2: Vegetation communities, threatened species and significant fauna

3. SIGNIFICANT NATURAL VALUES

In order to work out the most important areas in the study area for protecting from Spanish heath invasion, the natural values described in Section 2 above are ranked as to their significance, from very high to nil.

The following values are attributed to each significance level:

Very High

- Records of flora species listed on the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (*EPBCA 1999*). 20m buffer around each record or polygons as mapped.
- Habitat of fauna species listed on the *EPBCA 1999*. This includes confirmed records, den sites or active nest sites.
- Vegetation communities listed on the *EPBCA 1999.*

High

- Records of flora species listed on the *Tasmanian Threatened Species Protection Act 1995* (*TSPA 1995*) as vulnerable or endangered. 20m buffer around each record or polygons as mapped.
- Habitat of fauna species listed on the *TSPA 1995*. This includes confirmed records, den sites or active nest sites.
- Vegetation communities listed on the *Tasmanian Nature Conservation Act 2002* (*NCA 2002*).

Medium

- Records of flora species listed on the *TSPA 1995* as rare. 20m buffer around each record or polygons as mapped.
- Potential habitat of fauna species listed on the *EPBCA 1999* or the *TSPA 1995.*
- Modified vegetation communities (partially cleared or disturbed) listed on the *Tasmanian Nature Conservation Act 2002* (*NCA 2002*).

Low

- Non-threatened Native vegetation communities.

Nil

- Non-native vegetation communities (cleared or agricultural land).

Figure 3 shows the distribution of the very high, high and medium significance natural values.

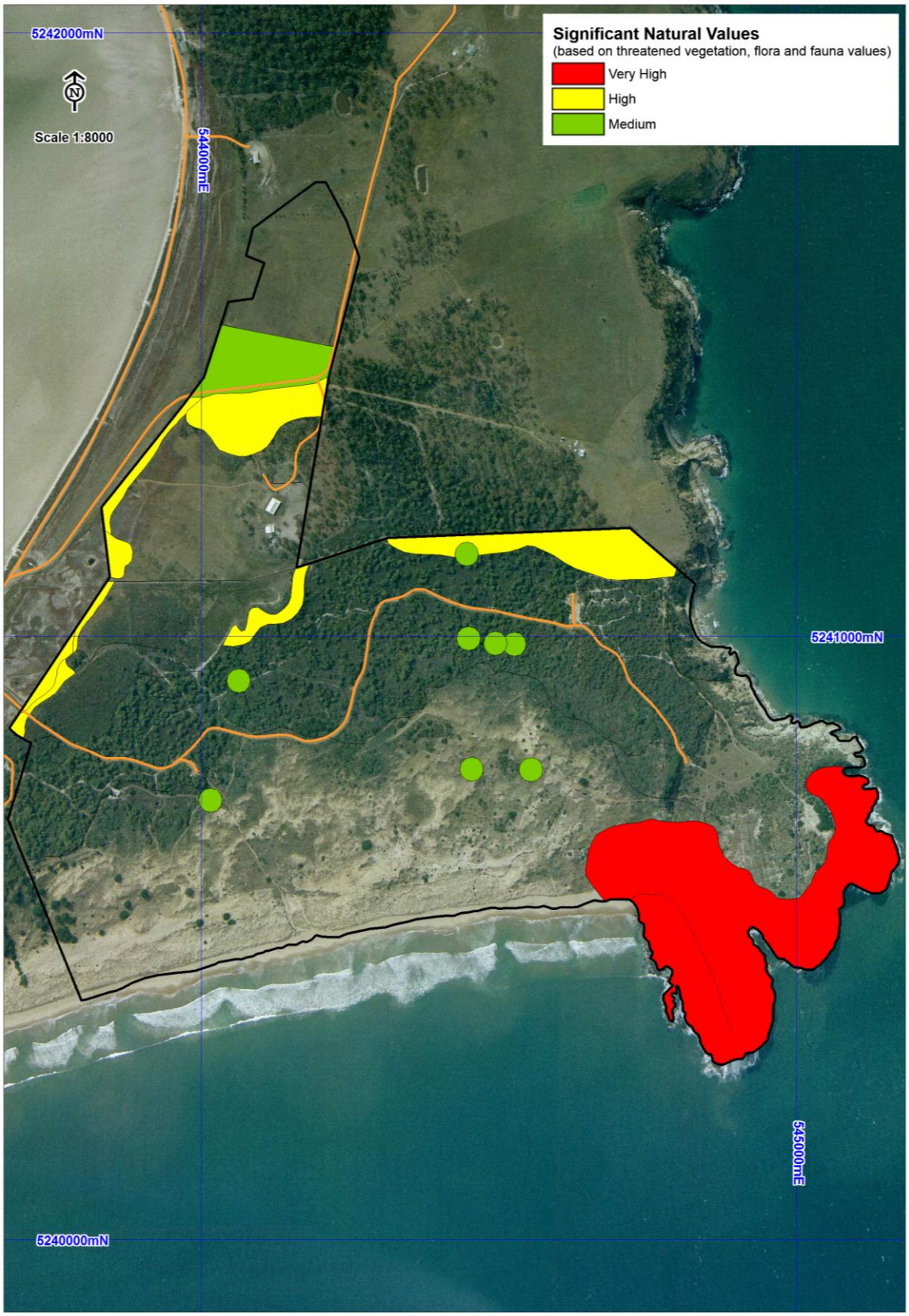

Figure 3: Significant natural values

4. SPANISH HEATH (*Erica lusitanica*)

Description

Spanish heath is an erect, multi-stemmed woody shrub that can grow up to 3 m in height. It is evergreen, with white flowers opening from pink buds, mostly in winter.

Status

It is a declared weed under the Tasmanian *Weed Management Act 1999*. The *Spanish heath Statutory Weed Management Plan* defines the municipality of Clarence as a 'Zone B' municipality, for which containment is the principle management objective.

Spanish heath seedling on site

Spanish heath mature flowering plants on site

Spread

Spanish heath is a prolific seeder, capable of producing millions of dust-like seeds each year. It flowers from late autumn to early spring[5], although this can vary with seasonal and rainfall variability, with seeds following the senescence of flowers. The seeds are spread by wind and water, and can also be dispersed by animals, bushwalkers, vehicles and machinery. Most seed remains viable for two to three years with a small percentage remaining viable for at least four years[6]. Fire appears to create ideal conditions to facilitate germination and seedling establishment. This prolific regeneration can also be used to advantage in control programs, as the mass germination can then be controlled with herbicides and thus a large proportion of the soil seed bank can be eliminated in one event.

General Impact

This species is of environmental concern as it can invade and spread into high quality native bushland without the assistance of a disturbance event. However, fire does appear to create ideal conditions to facilitate germination of seeds and seedling establishment. Spanish heath is capable of completely dominating the understorey of bushland and will displace native species, to the detriment of both native flora and fauna species.

[5] DPIPWE (2012a) Spanish Heath Control Guide

[6] Muyt (2001)

Site Specifics

The distribution of Spanish heath on the property has been mapped by Wildcare Deslacs, who provided their data for this project.

Spanish heath appears to have been on the property for some time as the infestations appear to be relatively well established. The heaviest infestations occur in the western half of the study area in areas that have been cleared for agriculture. These infestations appear to be very well established and must have been present for a long time. There is another region of heavy infestation on Cape Deslacs itself, which although not quite as dense an infestation, is still well established. Between these two regions, throughout the remainder of the reserve, there are small isolated infestations.

See Figure 4 for the full distribution of Spanish heath (as mapped by Wildcare Deslacs and supplied by Peter Rice, Wildcare Deslacs).

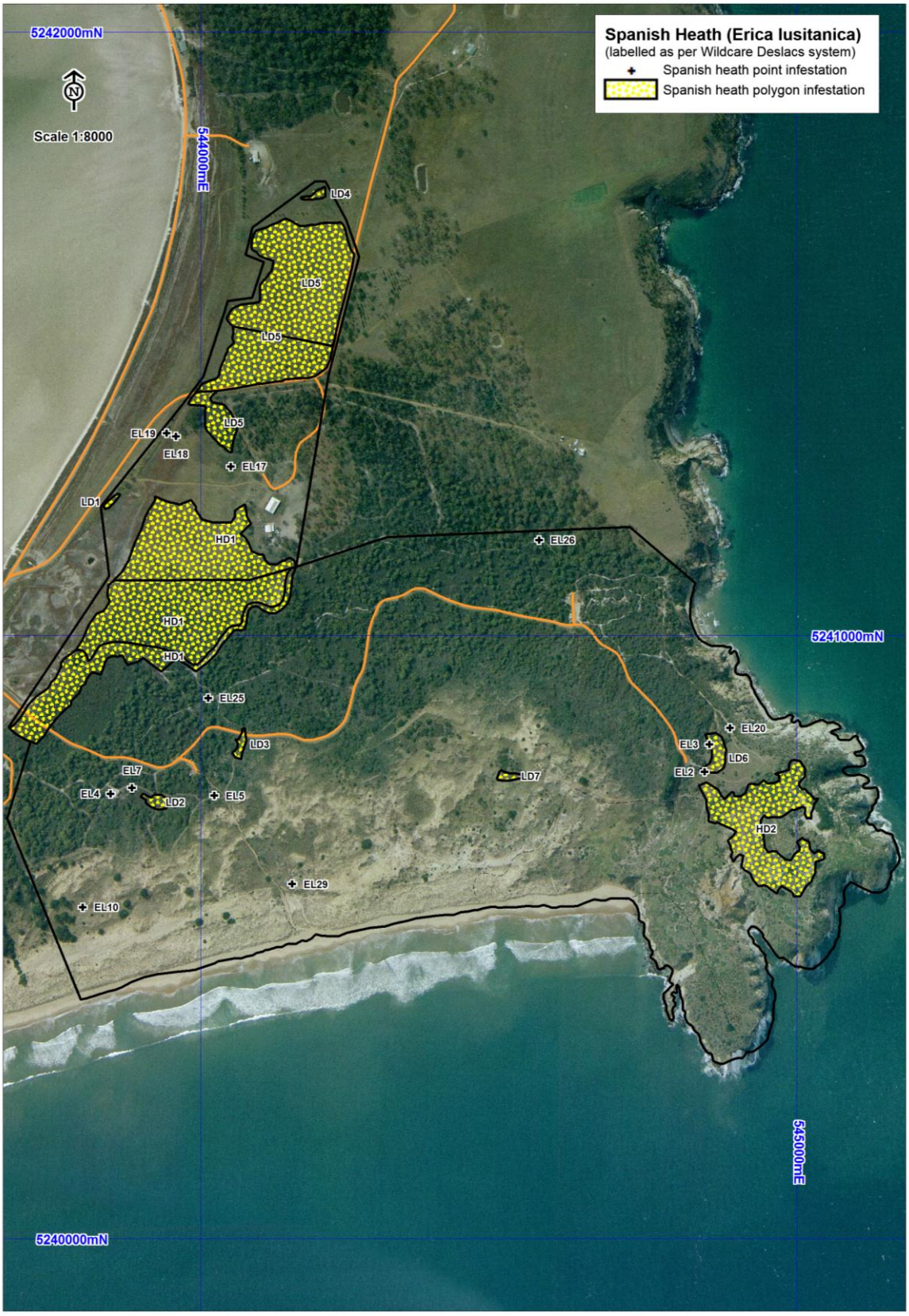

Figure 4: Spanish heath distribution

5. CONTROL METHODS

Control of Spanish heath will vary depending on the situation it is growing in and the need for more sensitive methods to be applied. Control methods for the study area fit in to one of three categories:

A. bushcare/ sensitive control

B. broad scale spraying

C. intensive control and rehabilitation

A. Bushcare/ Sensitive Control

A combination of the following methods are to be used in more sensitive areas, typically remnant native vegetation or modified areas that retain a high diversity of native species, allowing for good regeneration potential. Techniques that can be used include:

1. Hand pulling – in autumn (after opening rains), winter and spring when the soil is moist. Care needs to be taken to not overly disturb the soil. To prevent regrowth ensure the roots are removed.
2. Grubbing – using a mattock or similar implement, and again in autumn (after opening rains), winter and spring when the soil is moist. Care needs to be taken to not overly disturb the soil. To prevent regrowth ensure the roots are removed.
3. Spot spraying – in spring and summer when the plant is actively growing, and uptake of herbicide will be most effective. Care needs to be taken to avoid spray drift and off target damage to native plants. Weather conditions must be light winds and dry to be effective.
4. Cutting and swabbing – in spring and summer when the plant is actively growing, and uptake of herbicide will be most effective. Herbicide needs to be applied immediately after the plant is cut at the base.

The following photos indicate situations from on site where bushcare/ sensitive control methods should be used.

Spanish heath amongst coastal grasses

Spanish heath within coastal scrub

Spanish heath amongst degraded E. ovata community

Spanish heath invading healthy bushland

Where possible any cut material that is known to contain mature seed should be bagged, removed from site and disposed of appropriately. If this is not possible, it can be disposed of in an area that is known to already contain a seed bank.

B. Broad Scale Spraying

This method is used in cleared agricultural land, and within the study area the Spanish heath has already been slashed to ground level. Spraying occurs with agricultural boom spray equipment using a woody weed specific herbicide. This type of herbicide will control broad leaf and woody plants but not grasses. Within the study area suitable areas for this technique are all on private property. Buffer spraying between the major infestation area and private property may also be suited to this technique.

The following photos indicate situations from on site where broad scale spraying can be used.

Cleared agricultural land with slashed Spanish heath

Cleared agricultural land with slashed Spanish heath

Spraying of these infestations year after year is not necessarily the best approach, due to a chance of herbicide resistance developing and the unnecessary overuse of chemicals. Whilst broad scale spraying needs to be a part of the solution, it should be interspersed with other methods such as burning and slashing (see C below) to mix up the control techniques being used.

C. Intensive Control and Rehabilitation

To be used in dense infestations where Spanish heath is at close to 100% cover. This density of infestation only occurs in one part of the reserve, however due to the severity of the infestation and its size (approx 3 ha), it will require a serious commitment to properly remediate. Control will need to be a staged process undertaken over several years. There are likely to be several ways in which remediation can be approached, and whilst a suggested approach will be given below, alternative approaches or timing of parts of the program could be considered and may work equally as well in the long run. It is essential to monitor and assess the effectiveness of each stage or activity before determining and moving on to the next step. Certain activities may need to be adapted and some may need to be repeated to obtain the best results.

The following stages are needed, and are suggested in this chronological order:

1. Slashing
2. Burning of trash
3. Broadacre spraying of regrowth/ germination
4. Follow up spraying
5. Revegetation
6. Follow up spot spraying
7. Revegetation maintenance
8. Ongoing follow up maintenance of Spanish heath and revegetation

Slashing will encourage vigorous regrowth, and burning will promote extensive germination of the seed bank. It is hoped that with a planned control and rehabilitation program in place that this regeneration will be readily controlled and help to exhaust the seed bank.

The following photos indicate the situation from on site where intensive control and rehabilitation can be used.

Spanish heath dense infestation

Spanish heath dense infestation

Hygiene Principles

Spanish heath is a prolific seeder, capable of producing millions of dust-like seeds each year. The seeds are spread by wind and water, and can also be dispersed by animals, bushwalkers and vehicles.

The management of vehicles, other machinery and human movement can assist greatly in preventing the further spread of Spanish heath. Good hygiene practices in the form of cleaning of vehicles, machinery, equipment and other material are very important. Vehicles that are entering the reserve should be clean and free of mud, dirt and plant material before entering the site. This should apply to any Parks & Wildlife Service (PWS) or contractor vehicles and particularly slashing or mowing equipment. Where possible, consideration should be given to restricting the access of vehicles through infested areas during the control program, particularly when Spanish heath is seeding.

Slashers and mowers can transport seed from infested to non-infested sites. To avoid this Spanish heath plants should not be slashed when in seed. Spanish heath flowers from late autumn to early spring[7], although this can vary with seasonal and rainfall variability, with seeds following the senescence of flowers. Machinery modifications that restrict the build up of seed on slashers and mowers, including guards and fans, assist in preventing the spread of weeds particularly along roadsides. If slashing is unavoidable when Spanish heath is in seed, vehicles should be cleaned before moving out of the area and before moving to a non-infested site. Training adjacent private landholders involved in this management plan, in best practice vehicle hygiene practices would help to reduce the inadvertent spread of Spanish heath, and thus facilitate the goals of this plan.

Fire tracks that are currently being slashed within the reserve are a known problem site for Spanish heath to be re-introduced indicating that good hygiene practices are not being followed. Following the recommendations in this plan will help to remedy this situation. In addition, it is recommended that all Spanish heath be controlled with herbicides within these fire breaks prior to slashing re-continuing in these areas.

To facilitate the cleaning of vehicles before and after leaving the site a washdown location should be specified by PWS management. Washdown and cleaning requirements should be specified in any slashing contracts, and PWS staff should be made aware of, and adhere to these requirements.

Human movement through infested areas during seeding times can also assist in spreading Spanish heath further as the seed will readily attach to clothing and footwear. Wildcare volunteers should be aware of the timing of seeding and where possible avoid movement through these areas at these times. If movement through these areas is unavoidable then it should be done carefully, trying not to brush against plants. Similar logic applies to livestock in agricultural areas - if possible livestock should be kept out of areas when Spanish heath is in seed, or should not be moved from infested to clean areas.

The Tasmanian *Washdown Guidelines for Weed and Disease Control*[8] provide some explicit prescriptions on how civil works should be undertaken to minimise the risk of inadvertent spread of weeds into, around, and out of a site affected by weeds. See Appendix 1 for further details.

[7] DPIPWE (2012a) Spanish Heath Control Guide

[8] DPIPWE (2004)

Herbicides

Only registered herbicides and those listed under an Off-label Permit issued by the Australian Pesticide and Veterinary Medicines Authority (APVMA) are legally allowed to be used in the control of weeds. Users should contact their local DPIPWE Weed Management Officer, and the chemical manufacturers for details. Information to be sought should include herbicide mixes and rates, equipment, safety measures and appropriate methods and techniques. DPIPWE Spanish heath control guide[9,10] provides details of herbicides registered for use, including those covered by Environmental Weed Off-label Permit 13160[11] (also see Appendix 3).

Selective herbicides, with active ingredients such as triclopyr, picloram and aminopyralid, are preferable where herbaceous species are also present as these only affect woody plants. Broad spectrum herbicides, with active ingredients such as glyphosate will result in potentially more collateral impacts as they will affect all plants. In some cases they are preferred as they are non residual. Selective herbicides are however likely to produce better control results. In some control sites that are highly sensitive due to their proximity to waterways, control may be restricted to glyphosate products registered for use near waterways.

These active ingredients are referred to in the implementation schedule. Up to date information should always be sought as products and recommendations can change regularly.

Fire

In the event that an uncontrolled wild fire burns part or all of an infestation area, germination and seedling establishment is likely to be prolific. This should be seen as a control opportunity as a large amount of the seed bank is likely to germinate as a result of the fire. Consequently if the germinants are then controlled, the seed bank can be significantly reduced. In this unplanned scenario, Wildcare Deslacs could allocate additional control time to a burnt area, or alternatively funding could be sought to employ contractors to undertake the work.

[9] DPIPWE (2012a) Spanish Heath Control Guide

[10] DPIPWE (2012b) Herbicides for Spanish Heath Control

[11] APVMA (2012) Environmental Weed Off-label Permit 13160

6. MANAGEMENT PRIORITISATION PROCESS

For weed management to be effective, it needs to be prioritised. Using the location of significant natural values and all known Spanish heath infestations, whilst also taking in to account ease of management and work already carried out, the infestations within the study area have been prioritised using the following criteria:

Priority 1

- all small, isolated, previously treated infestations in native vegetation
- threatened vegetation communities
- significant fauna habitat
- buffers (10m) protecting threatened vegetation communities or significant fauna habitat
- any infested roadsides particularly where slashing occurs

Priority 2

- all small, isolated, previously treated infestations in cleared or agricultural land
- major isolated infestations adjacent to threatened vegetation communities or significant fauna habitat

Priority 3

- native vegetation buffering the major infestation area (4A)
- modified threatened vegetation community

Priority 4

- major infestation area

Priority 5

- large infestations in cleared, slashed land

From this process, each infestation has been assigned in to a priority group from 1 to 5. As there are more than one infestation within each priority group it has been further prioritised within each priority group with letters A, B, C etc. This should aid Wildcare Deslacs which infestations need to be controlled first. Thus all infestations will have a numerical and alphabetical character, i.e. 1A, 2B etc. These infestations are shown below on Figure 5 and in the Implementation Schedule in Section 7.

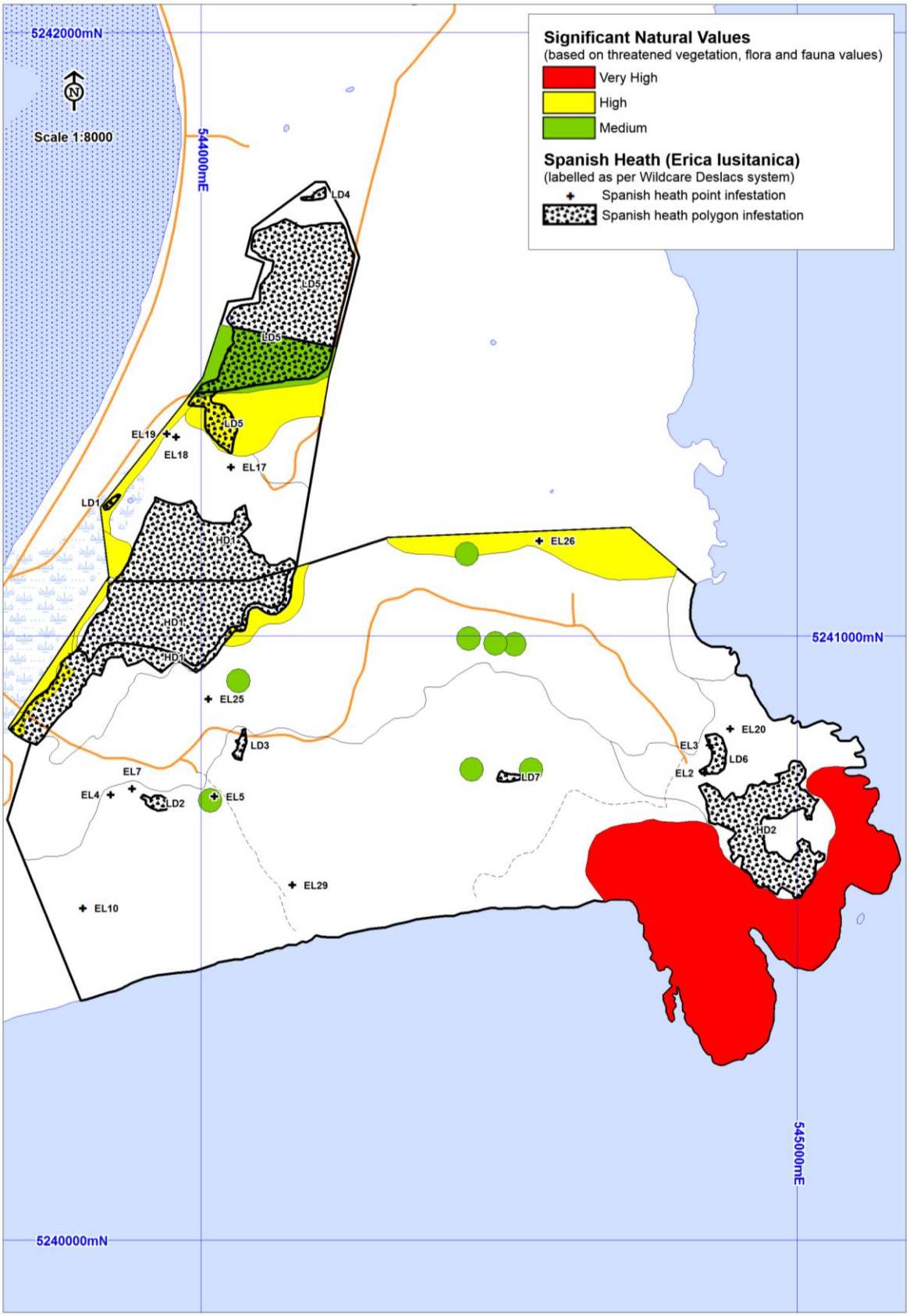

Figure 5: Significant natural values and Spanish heath distribution

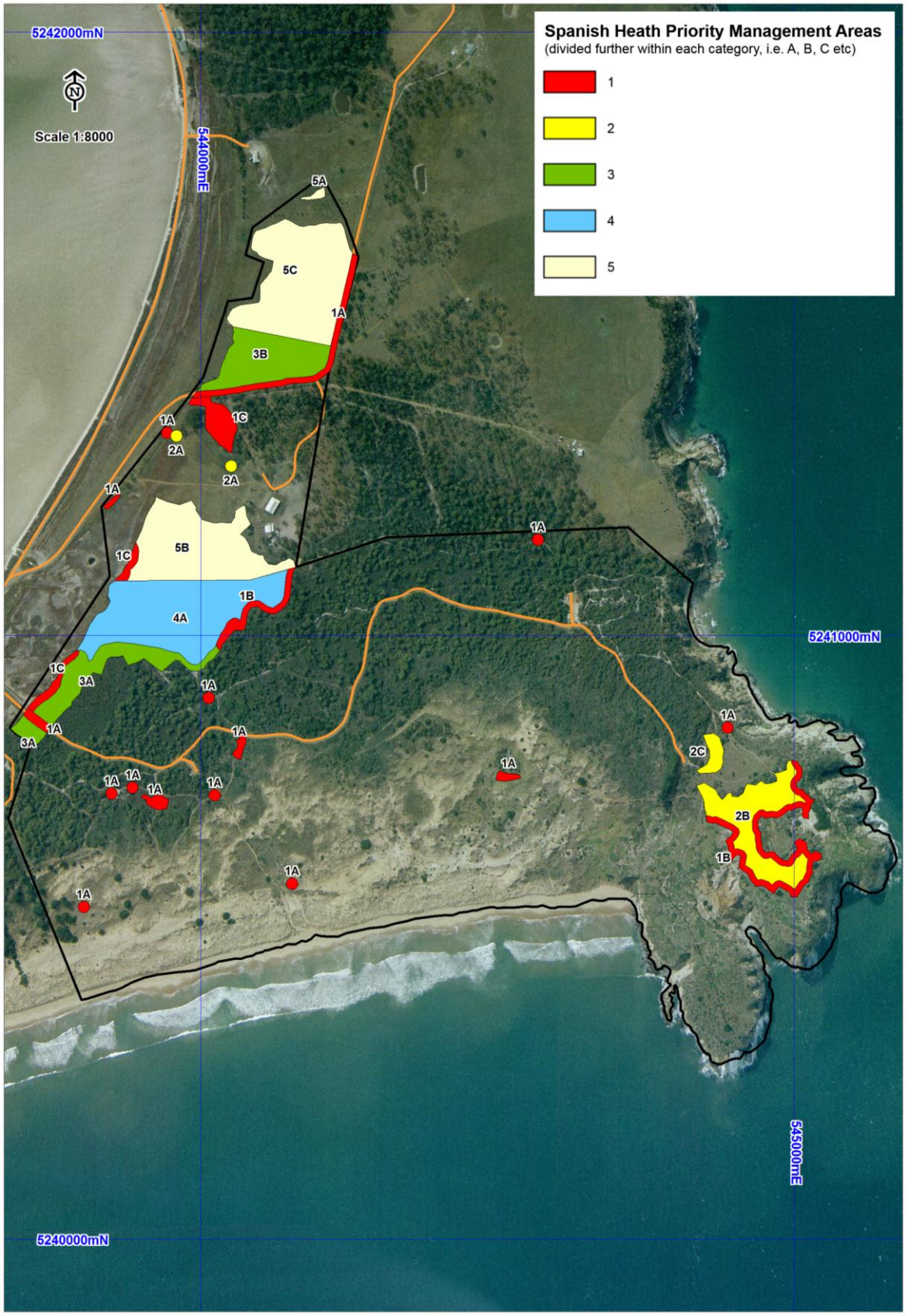

Figure 6: Priority management areas

7. IMPLEMENTATION SCHEDULE

The following implementation schedule is intended to give a prioritised list of actions for Wildcare Deslacs to undertake over a 10 year period. It is divided in to yearly tasks, and they are listed in priority order. Each task is described in association with the year, management area, method, optimal control period (or timing), recommended herbicide, total area of the infestation and which group is responsible for undertaking the task.

Tasks have been allocated to Wildcare Deslacs, Parks & Wildlife Service, private landholders and bushcare contractors. It is acknowledged that there is currently a limited amount of time available to Wildcare Deslacs to carry out tasks, and the schedule is deliberately conservative in light of this. It is aspirational, and realistic given the available resources. Consequently, grants will need to be sought to employ bushcare contractors to implement a large amount of the schedule. The Parks & Wildlife Service have committed to undertake the tasks allocated to them in the schedule. Private landholders will try to commit what time and resources they can. All parties involved will need to communicate with each other to get the best possible outcome.

The schedule is in a format that is readily updateable so that in a few years time it can easily be updated and revised to take into account what has and has not been done and any new tasks that may be needed. Wildcare Deslacs should also be opportunistic in their approach to the schedule tasks so that they can take advantage of any control opportunities that may arise and shuffle the order of things where they see necessary.

IMPLEMENTATION SCHEDULE

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
1 (2013)	1A	small, isolated, previously treated infestations in dunes and coastal scrub	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 1,960	• Wildcare Deslacs
	1A	small, isolated, previously treated infestations on fire tracks and edge of main road entrance	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 2,970	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• primary control	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• primary control of outlier plants within buffer • extend as close as possible back to dense infestation as time allows	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• primary control of outlier plants within buffer • extend as close as possible back to dense infestation as time allows	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• primary control of outlier plants within buffer • extend as close as possible back to dense infestation as time allows	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	3B	modified threatened vegetation community on private property	• primary control from outer edge of infestation extending 10m in	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	buffer between major infestation area and private property	• spray 5m buffer along boundary with private property	• spray	• spray - Sep to Jan	• Triclopyr	• 2,200	• Parks & Wildlife Service

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders
	NA	NA	• creation of washdown location for vehicles entering site	• NA	• NA	• NA	• NA	• Parks & Wildlife Service
	NA	NA	• training adjacent private landholders in best practice vehicle hygiene practices	• NA	• NA	• NA	• NA	• Parks & Wildlife Service

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
2 (2014)	1A	small, isolated, previously treated infestations in dunes and coastal scrub	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 1,960	• Wildcare Deslacs
	1A	small, isolated, previously treated infestations on fire tracks and edge of main road entrance	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 2,970	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• primary control	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• primary control 10m in from outer edges	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• primary control 10m in from outer edges	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor
	3A	native vegetation buffering the major infestation area	• primary control from southern edge of infestation extending 10m in	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor
	3B	modified threatened vegetation community	• follow up control on all previously treated infestations • primary control from outer edge of	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
			infestation extending 10 - 20m in					
	4A	buffer between major infestation area and private property	• spray 5m buffer along boundary with private property	• spray	• spray - Sep to Jan	• Triclopyr	• 2,200	• Parks & Wildlife Service
	4A	major infestation area	• weed control and revegetation grant preparation and application	• NA	• NA	• NA	• 29,750	• Wildcare Deslacs
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
3 (2015)	1A	small, isolated, previously treated infestations in dunes and coastal scrub	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 1,960	• Wildcare Deslacs
	1A	small, isolated, previously treated infestations on fire tracks and edge of main road entrance	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 2,970	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• primary control 10 - 20m in from outer edge • follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• primary control 10 - 20m in from outer edge • follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor
	3A	native vegetation buffering the major infestation area	• primary control from southern edge of infestation extending 10 - 20m in • follow up control on	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
			all previously treated infestations					
	3B	modified threatened vegetation community	• primary control from outer edge of infestation extending 20 - 30m in • follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	buffer between major infestation area and private property	• spray 5m buffer along boundary with private property	• spray	• spray - Sep to Jan	• Triclopyr	• 29,750	• Parks & Wildlife Service
	4A	major infestation area	• preparatory slashing • burning of trash • spraying of regrowth, new germination	• slashing • burning • spraying	○ slash - Feb - Mar ○ burn - Apr - May ○ spray - Sep to Jan	• Triclopyr	• 2,200	• Bushcare Contractor
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
4 (2016)	1A	small, isolated, previously treated infestations in dunes, coastal scrub and on fire tracks	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 4,190	• Wildcare Deslacs
	1A	edge of main road entrance	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 740	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• primary control 20 - 30m in from outer edge • follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
	3A	native vegetation buffering the major infestation area	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor
	3B	modified threatened vegetation community	• primary control from outer edge of infestation extending 30 - 40m in • follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	major infestation area, including 5m buffer	• contract tubestock growing for 2017 planting • spraying of regrowth, new germination (2 spray events)	• spraying	○ contract - Jan ○ spray - Sep ○ spray - Jan	• Triclopyr	• 29,750	• Bushcare Contractor
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
5 (2017)	1A	small, isolated, previously treated infestations in dunes, coastal scrub, fire tracks and main road entrance	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 4,190	• Wildcare Deslacs
	1A	edge of main road entrance	• slash	• slash with mower	• slash - Jan to Mar	• NA	• 740	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer • primary control to increase buffer size where possible	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor
	3A	native vegetation buffering the major infestation area	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
	3B	modified threatened vegetation community	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	major infestation area, including 5m buffer	• planting • spraying of regrowth, new germination (pre and post planting) • summer watering	• spraying • planting • watering	○ spray - Apr ○ planting - May ○ spray - Sep ○ watering - Jan/Feb	• Triclopyr	• 29,750	• Bushcare Contractor
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
6 (2018)	1A	small, isolated, previously treated infestations in dunes, coastal scrub, fire tracks and main road entrance	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 4,190	• Wildcare Deslacs
	1A	edge of main road entrance	• slash	• slash with mower	• slash - Jan to Mar	• NA	• 740	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor
	3A	native vegetation buffering the major infestation area	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
	3B	modified threatened vegetation community	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	major infestation area, including 5m buffer	• spraying of regrowth, new germination (2 spray events) • plant maintenance	• spraying	○ plant maintenance - Sep ○ spray - Sep ○ spray - Jan	• Triclopyr	• 29,750	• Bushcare Contractor
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
7 (2019)	1A	small, isolated, previously treated infestations in dunes, coastal scrub, fire tracks and main road entrance	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 4,190	• Wildcare Deslacs
	1A	edge of main road entrance	• slash	• slash with mower	• slash - Jan to Mar	• NA	• 740	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor
	3A	native vegetation buffering the major infestation area	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
	3B	modified threatened vegetation community	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	major infestation area, including 5m buffer	• spraying of regrowth, new germination (2 spray events) • plant maintenance	• spraying	○ plant maintenance - Sep ○ spray - Sep ○ spray - Jan	• Triclopyr	• 29,750	• Bushcare Contractor
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
8 - 10 (2020 - 2022)	1A	small, isolated, previously treated infestations in dunes, coastal scrub, fire tracks and main road entrance	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate	• 4,190	• Wildcare Deslacs
	1A	edge of main road entrance	• slash	• slash with mower	• slash - Jan to Mar	• NA	• 740	• Parks & Wildlife Service
	1A	edges of private road, up to fence	• follow up control on all previously treated infestations	• spot spray	• spray - Sep to Jan	• Glyphosate, or • Triclopyr	• 4,270	• Private landholders
	1B	buffers (10m) protecting seabird rookery complex	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 7,470	• Bushcare Contractor
	1B	buffers (10m) protecting *E. ovata* community	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,550	• Bushcare Contractor
	1C	buffers (10m) protecting saltmarsh community	• follow up control to maintain buffer	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 2,150	• Bushcare Contractor
	1A, 1C, 2A	small, isolated, previously treated infestations on private property	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 4,630	• Private landholders
	2B	major isolated infestation adjacent to seabird rookery complex	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,130	• Bushcare Contractor
	2C	major isolated infestation north of 2B	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 1,690	• Bushcare Contractor
	3A	native vegetation buffering the major infestation area	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 11,210	• Bushcare Contractor

Year	Mangt. Area	Area Description	Task	Method	Optimal Control Period	Herbicide (active ingredient)	Total Area (square metres) (rounded to nearest 10m)	Responsibility
	3B	modified threatened vegetation community	• follow up control on all previously treated infestations	• cut & swab, hand pull, spot spray	• spraying, cut & swab - Sep to Jan • hand pull, grub - May to Nov	• Glyphosate, or • Triclopyr	• 13,400	• Private landholders
	4A	major infestation area, including 5m buffer	• spraying of regrowth, new germination	• spot spray	• spray - Sep to Jan	• Triclopyr	• 29,750	• Bushcare Contractor
	5A, 5B, 5C	large infestations in cleared, slashed land	• spraying of entire infestation	• broadacre spraying	• spray - Sep to Jan	• Triclopyr	• 52,480	• Private landholders

8. MONITORING AND EVALUATION

Monitoring and evaluation of weeds and management actions undertaken is essential to ensure efficiency, analyse the success 0f management actions and to justify the allocation of resources. Particularly in light of limited funding, it is important to monitor to ensure the effectiveness and progress within a weed control program.

Monitoring is most necessary where management actions are being undertaken to record the progress and effectiveness of those actions. It could also be undertaken in a reserve where no management is occurring, to monitor the advance of weeds. The most effective monitoring methods for Wildcare Deslacs are:

- photopoints
- resurvey weeds
- vegetation condition analysis

Photopoints are fixed points from which a photograph is taken of a particular subject at different times for comparison. Photopoints offer opportunities to efficiently and cost effectively monitor change and compliance. Their role in monitoring is potentially very important because they are a faithful record of changes over time. Photographs provide the advantage of recording changes of variables that were not measured in a more traditional survey and they illustrate the impact of changes that have been measured. This is a powerful tool for convincing others that significant change has or has not occurred. Photopoints can be set up to monitor a particular weed species or to monitor an important location, such as where a threatened flora population occurs or within a threatened vegetation community. Photopoints are most useful when they are set up before any initial work is undertaken. See Appendix 2 for a suggested photo point method.

The current Spanish heath data was collected by Wildcare Deslacs in a rigorous manner that is an accurate representation of the weed distribution at a point in time before this plan was implemented. This data allows an estimate of area of occupancy for each separate infestation to be estimated within the reserve, and for the reserve as a whole. For monitoring purposes the survey process can simply be repeated at a later date, and the area of occupancy figure recalculated to see what the difference is. Progress can be seen in the increase or decrease in the area of occupancy of each infestation or for the reserve as a whole. Using a geographic information system, simple analysis of the data can compare areas of infestation through time to monitor progress.

Vegetation condition analysis is an essential element of monitoring vegetation condition and extent. A specific methodology has been created by the Vegetation Section of DPIPWE to assess vegetation condition. The method for assessing condition is detailed in the manual cited below[12]. This methodology uses a scoring system to objectively assess vegetation condition for different vegetation types across Tasmania. Benchmark vegetation condition scores have been established for most Tasmanian vegetation types. The method involves the comparison of current vegetation condition to the benchmark condition criteria. Vegetation is scored according to attributes including the density of trees, species diversity, species recruitment, landscape context and weeds. Once a site has been assessed and assigned a vegetation condition score, this score should be used as a baseline for the

[12] DPIPWE (2006) Tasveg Vegetation Condition Manual

site. Future measurements of the vegetation condition score can then be compared to this baseline to monitor changes in the score and hence changes in condition of the vegetation at the site. The score can also assessed against the benchmark for the particular vegetation community to see how it compares.

Updating of Schedule and Plan

This management plan, and in particular the implementation schedule should be regularly updated to show what work has been carried out. In this way it can be an accurate record of the work that has been undertaken. It should also inform as to what tasks were successful and those that did not work and why. The plan and the schedule can then be amended to take into account improvements to methods, timing or any other relevant changes.

9. BIBLIOGRAPHY

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APPENDIX 1 – WASH-DOWN SUGGESTIONS

Extracts form Tasmanian Washdown Guidelines (DPIPWE 2004)

General washdown procedure

Note: Do NOT apply water to harvesters or other equipment that may be damaged by water.

1. Locate washdown site and prepare the surface or construct bunding as required.
2. Safely park the vehicle free of any hazards (*e.g.* electrical), ensure the engine is off and the vehicle is immobilised.
3. Look over the vehicle, inside and out, for where dirt, plant material including seeds are lodged. Pay attention to the underside, radiators, spare tyres, foot wells and bumper bars.
4. Remove any guards, covers or plates if required being careful of any parts that may cause injury.
5. Knock off large clods of mud, use a crow bar if required and sweep out the cabin.
6. Use a vacuum or compressed air where available for removing dried plant material like weed seeds and chaff in radiators and other small spaces where this material lodges. Brush off dry material if no other facilities are available.
7. Clean down with a high pressure hose and stiff brush/crowbar. Use only freshwater if washing down in the field.
8. Start with the underside of the vehicle, wheel arches, wheels (including spare). Next do the sides, radiator, tray, bumper bars etc and finally upper body. Some vehicles may need to be moved during washdown *e.g.* tracked machinery.
9. Clean any associated implements, *e.g.* buckets.
10. Check there is no loose soil or plant material that could be readily dislodged or removed.
11. In wash bays, steam treat or rinse off vehicle with clean water.
12. Wash effluent away from vehicle, do not drive through wash effluent.

Machinery checklists

Trucks and vehicles

For small vehicles in the field where washdown facilities cannot be provided the minimum requirement is:

> all loose and large clods of dirt should be physically knocked off the vehicle at the desired washdown point before driving back to a suitable wash facility.

Systematically inspect and clean, including:

Cabin	floor, mats and under seats
Engine	radiators
	engine bay and grill
Body	hollow channels
	inside bumper bars
	crevices and ledges
	underside
Wheels	inside and outside
	between dual wheels if fitted
	spare wheel
Tray	hollow channels
	chassis

Wheeled machinery (skidders, tractors, loaders, *etc*.)

Systematically inspect and clean, including:

Cabin	floor and under seats
Engine	grill, radiator, oil cooler, *etc*.
	around sound deadening panels
	engine compartment grill
Body	chassis
	axle housing, hollow sections
	guards
	cab steps
	around fuel tank
	hollow sections in drawbars and retractable/extendable type three point linkages

	general holes, ledges, gaps and crevices in body including damaged boots, cover plates where trash may lodge
Wheels	inside and outside wheels and rims
	spaces between dual wheels
	chains if fitted
Attached equipment	buckets/ blades including teeth and adaptor plates
Hydraulic arms	crevices where trash can lodge

Bulldozers

Systematically inspect and clean, including:

Cabin	floor and under seats
	below transmission coverplates
Engine	radiator, oil cooler etc
	airfilters (for seeds)
	around engine bay
Tracks	lift inspection/coverplates to gain inside access
	idler wheels
	track frame
Body Plates	knock lose material out from belly plates and rear plates as far as is feasible without dismantling
Body	fuel cells
	battery box
Blade	check all hollow sections
	pivot points and adaptors at rear of blade where soil can compact
Tines	crevices where trash can lodge
Ripper	ripper frame support which is usually hollow
	compacted soil underneath ripper points

Excavators

Systematically inspect and clean, including:

Cabin	floor and under seats
Engine	grill, radiator, oil cooler etc
	around engine bay
Tracks	idler wheels
	track frame
	tracks
	removable track adjustor guards and lubrication points
Body Plates	glacier plate near radiator
Body	ledges and channels
Blade	check all hollow sections
	between teeth of adaptors
	wear plates
Booms	crevices
Turret pivot	under and around mechanism

Washdown Ledger

Date	Operator	Machine	Location

APPENDIX 2 – PHOTO POINT METHOD

Establishment

- Identify sites that are typical of the vegetation type in the area
- Ensure the change you are interested in can be photographed
- Ensure the growth of vegetation does not prevent important subjects from being seen in a future photograph.
- Use a digital camera lens of the same specification each time the site is photographed.
- The focal length must be the same.
- The camera must be in the same position
- The date and time of day should be as close as possible to previous photographs.
- Preferably choose a south facing photo point to avoid sun glare.
- Mark the photopoint number on a metal tag and wire the tag to the steel post.
- Fix a yellow safety cap to the top of the metal post, this will also assist relocation

Site Layout

1. Hammer a dropper into the ground so that the top is at 1.4-1.6 m. This is referred to as the photo point peg. A metal numbered disc on a metal peg should mark each of the photo point pegs.
2. Another metal marker is located 10 - 20 m (or a consistent z m) from the photo point peg in the direction of the view. This is referred to as the sighter peg. The distance to the sighter peg may need to be adjusted to suit sloping ground. If the ground slopes down away from the photo point the sighter may need to be closer and visa versa.
3. A third peg may be placed at 50 m from the sighter peg and used to align the three points and hence ensure the photographs are taken along the same line or else simply as a reference. This distance may be adjusted (y m) to suit density that the vegetation.
4. Any number of ranging poles can be added to the view to indicate distance and height of vegetation.
5. Place a sighter card on the sighter peg and in the field of view with all relevant information with regard to the site written on it large enough to read on the photograph. Digital cameras may be able to do this step now and so a sighter card may not be necessary
6. Take the photograph. At least two photos should be taken of each photo-frame.

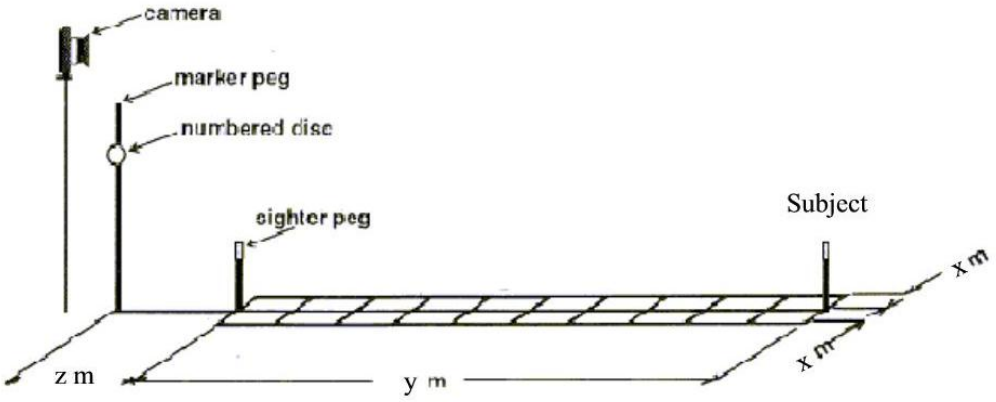

Figure 6.1.3. An example of a photo point site (including a transect which is not mandatory). The subject should be at or around the area indicated. The distances x, y and z may vary between photo points but should be fixed once established at each point.

Information Collected

Information printed in large letters on the sighter card (if your digital camera can not collect the same information):

- Project title
- Site Number
- Date
- Time

Additional information to be collected in your notes:

- Easting/Northing using a GPS
- Description of site location/layout to assist relocation
- Vegetation type: As per mapped descriptions.

APPENDIX 3 – ENVIRONMENTAL WEED OFF-LABEL PERMIT 13160

Australian Government
Australian Pesticides and Veterinary Medicines Authority

PERMIT TO ALLOW MINOR USE OF AN AGVET CHEMICAL PRODUCT

FOR THE CONTROL OF ENVIRONMENTAL WEEDS IN NON-CROP AND BUSHLAND SITUATIONS IN TASMANIA

PERMIT NUMBER - PER13160

This permit is issued to the Permit Holder in response to an application granted by the APVMA under section 112 of the Agvet Codes of the jurisdictions set out below. This permit allows a person, as stipulated below, to use the product in the manner specified in this permit in the designated jurisdictions. This permit also allows any person to claim that the product can be used in the manner specified in this permit.

THIS PERMIT IS IN FORCE FROM 7 FEBRUARY 2012 TO 31 MARCH 2017.

Permit Holder:
DEPARTMENT OF PRIMARY INDUSTRIES, PARKS, WATER AND ENVIRONMENT
Level 4, 134 MACQUARIE STREET
HOBART TAS 7000

Persons who can use the product under this permit:
Persons generally.

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CONDITIONS OF USE

Product to be used:
ROUNDUP BIACTIVE HERBICIDE BY MONSANTO
PLUS OTHER REGISTERED PRODUCTS
Containing: 360g/L GLYPHOSATE as their only active constituent

SICKLE HERBICIDE BY BAYER
PLUS OTHER REGISTERED PRODUCTS
Containing: 540g/L GLYPHOSATE as their only active constituent

NUFARM ASSOCIATE HERBICIDE
DUPONT BRUSH-OFF BRUSH CONTROLLER
FARMOZ LYNX WG HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 600g/kg METSULFURON METHYL as their only active constituent

ACCESS HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 240g/L TRICLOPYR & 120g/L PICLORAM as their only active constituents

GRASS-UP HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 300g/L TRICLOPYR & 100g/L PICLORAM as its only active constituents

GRAZON EXTRA HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 300g/L TRICLOPYR, 100g/L PICLORAM & 8g/L AMINOPYRALID as its only active constituents

GARLON 600 HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 600g/L TRICLOPYR as its only active constituent

ASSET HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 130g/L HALOXYFOP as their only active constituent

LONTREL HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 300g/L CLOPYRALID as its only active constituent.

KAMBA 500 HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 500g/L DICAMBA as its only active constituent.

MCPA 500 HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 500g/L MCPA as its only active constituent.

MCPA 750 HERBICIDE
PLUS OTHER REGISTERED PRODUCTS
Containing: 750g/L MCPA as its only active constituent.

KAMBA M HERBICIDE BY NUFARM
PLUS OTHER REGISTERED PRODUCTS
Containing: 340g/L MCPA PLUS 80g/L DICAMBA as its only active constituents.

Directions for Use:

Crop	Weeds	Rate
Non-crop and Bushland	Environmental Weeds as included in Attachment 1.	Apply in accordance with those instructions as contained in Attachment 1.

Critical Use Comments:
Use of glyphosate formulations in aquatic situations - only those specific glyphosate products which have label approvals currently in place for aquatic use may be used in or near aqautic areas.

Jurisdiction:
TAS only.

Additional Conditions:
This Permit provides for the use of a product in a manner other than specified on the approved label of the product. Unless otherwise stated in this permit, the use of the product must be in accordance with instructions on its label.

Persons who wish to prepare for use and/or use the products for the purposes specified in this permit must read, or have read to them, the permit particularly the information included in Details of Permit and Conditions of Permit.

Issued by

Delegated Officer

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ATTACHMENT 1

HERBICIDES FOR THE CONTROL OF ENVIRONMENTAL WEEDS
IN NON-CROP AND BUSHLAND AREAS (TASMANIA ONLY)

Crop/Animal/Situation			
Non cropping and bushland (native vegetation both forested and non forest, including urban bushland reserves)			
Active Ingredient	**Pest/purpose**	**Rate/dose**	**Critical comments Methods of application**
Glyphosate 360 g/L (where product has an aquatic registration)	General weed control eg. aquatic plants, grasses, herbs, shrubs and trees in all bushland situations. eg willows eg. butterfly bush, mirror bush , elisha's tears, cotoneaster, holly, spanish heath.	10-13 ml/L plus adjuvants ONLY in accordance with label as required	*spot spraying, knapsack*
		2ml undiluted per hole/cut	drill, axe
		1:5 - undiluted. trees and shrubs generally Undiluted for blackberry, bulbs and hard to kill weeds.	cut stump
Glyphosate 540 g/L (where product has an aquatic registration)	General weed control eg. aquatic plants, grasses, herbs, shrubs and trees in all bushland situations. eg willows eg. butterfly bush, mirror bush , elisha's tears, cotoneaster, holly, spanish heath.	as per existing registrations or if weed not recorded on label: 7ml/L plus adjuvants ONLY in accordance with label as required	spot spraying, knapsack, wiper
		2ml undiluted per hole/cut	drill, axe
		1:5 - undiluted. trees and shrubs generally Undiluted for blackberry, bulbs and hard to kill weeds.	cut stump
Triclopyr 240 g/L + Picloram, 120 g/L	Trees and woody weeds eg brooms, cape wattle, butterfly bush, mirror bush, cotoneaster, Spanish heath, tree lucerne, berberis	as per existing registrations or if weed not recorded on label: 1:60 in diesel	cut and paint
Triclopyr 300 g/L + Picloram, 100 g/L	Woody weeds,eg gorse, oldmans beard, Elisha's tears,	as per existing registrations or if weed not recorded on label: 350 -500 ml/ 100 L	spot spraying, knapsack
Triclopyr 300 g/L + Picloram, 100 g/L + Aminopyralid 8 g/L	Woody and broad leaf weeds generally eg Spanish heath, cotoneaster, hawkweeds, nightshades, Paterson's curse	as per existing registrations or if weed not recorded on label: 250 -500 ml/ 100 L	spot spraying, knapsack
Metsulfuron-methyl, 600 g/Kg	Bulbous, woody, and broad leaf weeds generally. eg blue bell creeper, montbretia, arum lily, onion weed, hawthorn, agapanthus	as per existing registrations or if weed not recorded on label: 10-15 g/100 L	spot spraying, knapsack
Triclopyr, 600 g/L	Trees and woody weeds generally eg. cape wattle, brooms, cotoneaster, Spanish heath	as per existing registrations or if weed not recorded on label: 170 ml/ 100 L	spot spraying, knapsack
		as per existing registrations or if weed not recorded on label: 1:60 in diesel	cut stump

Crop/animal/situation			
Non cropping and bushland (native vegetation both forested and non forest including urban bushland reserves)			
Active ingredient	Pest/purpose	Rate/Dose	Critical comments Methods of application
Haloxyfop-R methyl ester, 130 g/L (or as per new formulation)	Grasses generally including marram grass on coastal dunes	As per existing registrations or if weed not recorded on label: 20-40 ml / 10L + uptake spraying oil at 50 ml / 10L	Spot spray, knapsack
Clopyralid, 300 g/L	Thistles, hawkweeds	As per existing label registrations or if weed not recorded on label: 25 ml – 50 ml / 10L + surfactant	Spot spray, knapsack
		1:11 in water + surfactant	Wick wipe
Dicamba 500g/L	Perennials eg daisies, lupins, flat weeds	As per existing non cropping registrations or if weed not recorded on label: 6-85mL/10L	Spot spray, knapsack, wick wipe
MCPA 500g/L	Perennials, flat weeds, thistles	As per existing registrations or if weed not recorded on label: 20-50 ml / 10L	Spot spray, knapsack, wick wipe
MCPA 750g/L	Perennials, flat weeds, thistles	As per existing registrations or if weed not recorded on label: 13-27 ml / 10L	Spot spray, knapsack, wick wipe
MCPA 340g/L+ Dicamba 80g/L	Perennials, flat weeds, thistles	As per existing registrations or if weed not recorded on label: 40-50 ml / 10L	Spot spray, knapsack, wick wipe

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