Tamar
Natural Resource Management

George Town

Coastal Community Weed Plan 2012-2022

Tamar NRM

1. INTRODUCTION

The Plan recognises that: Coastal townships within George Town municipality contain areas of native vegetation cover with good species composition and structure. At a local, regional and/or State level these communities are worthy of conservation. However, at some locations weed pressure is intense and includes highly invasive species capable of outcompeting native plants. Left uncontrolled weeds will ultimately change the structure and complexity of native vegetation leading to a decline in its health; loss of floral and faunal diversity; and a change in the character and amenity of these settlements.

2. WEED MANAGEMENT OBJECTIVES

2.1 PRINCIPAL OBJECTIVES

- Conserve and restore the natural values of Crown, municipal and private foreshores, and native vegetation communities by reducing and eradicating weeds
- Encourage an appreciation by local residents and visitors to the natural values and the management objectives of the coastal townships.
- Create informed local communities and land managers whose management practices – including gardening - will reduce weed infestations.

2.2 SPECIFIC OBJECTIVES

- Control and eradicate environmental weeds.
- Protect significant native or indigenous fauna and flora values.
- Restore natural values of areas that have become damaged and/or degraded.
- Halt ongoing degradation of the natural values of public land caused by human disturbances, i.e. clearing, burning, or planting exotic species.
- Reduce off-site threats to the natural values of Crown and municipal land.

2.3 A COMBINED VISION FOR COASTAL TOWNSHIPS

By 2017 coastal townships and their environs will have healthy native bush and coastline, from which major invasive weeds have been removed. Regular and ongoing monitoring will ensure that weed seed banks are in decline. Township residents and visitors will be aware of the impact of weeds on native bush, gardens will be becoming free of weeds and plant waste will be properly disposed of so that infestation from dumping no longer occurs. Environmental weeds will be under control and gradually replaced with indigenous species. Ongoing and regular monitoring will ensure that new weeds are identified and eradicated before they become a threat to natural values.

Where required formal and informal agreements will have been brokered and implemented between the land managers and neighbouring landowners/managers in relation to management practices within and adjacent to native bushland and coastline. Agreements will provide an environment conducive to ongoing maintenance or enhancement of the natural values and mitigation off-site threats.

By 2022, where possible, all major environmental weeds will have been eradicated from coastal areas or will be actively controlled. Weed seed banks will have declined substantially through regular and ongoing community-based monitoring and action. The threat of reinfestation by environmental weeds and undesirable species from adjacent land or by deliberate introduction will have been dramatically lowered. Regeneration of native vegetation and/or native plantings will dominate previously degraded and cleared areas.

By 2032 formerly weed infested and cleared areas will be substantially restored. Indigenous plants will dominate and the presence of weeds at a minimum. Weed free areas will require limited intervention for the longer-term maintenance of their natural values. Weed management will be reduced to small management actions guided by annual monitoring.

3. IMPLEMENTATION SCHEDULE

This section summarises the main tasks required to implement the Plan, the parties responsible and a timetable for their completion is also proposed. The tasks are discussed in detail in Section 4 - Management Guidelines.

Task Description	*Responsibility*	*Timetable*
Maintain a Weeds / Vegetation Steering Committee to oversee implementation of the management plan	George Town Coastal Management Group (GTCMG) - with the support of; Tamar NRM, George Town Council, Crown Land Services, Parks and Wildlife, Landcare / Coastcare, Township Progress Associations	August 2013
Identify key people / groups at each township to carry out implementation and long-term monitoring and maintenance	GTCMG Weeds Steering Committee	August 2013
Identify land owners and managers	GTCMG Weeds Steering Committee Note - may require outside expertise e.g. Tamar NRM, GTC	December 2013
Consult land owners / managers	GTCMG Weeds Steering Committee Note - may require outside expertise and support e.g. Tamar NRM	December 2013
Adapt and run a "grow me instead" campaign	Tamar NRM	January 2014
Investigate providing new residents with a "New Residents information folder" advising of Council services and information on e.g. fire management, weed management, "grow me instead"	GTCMG Weeds Steering Committee - with consultation and support from George Town Council & Tamar NRM	June 2014
Through consultation identify and prioritise bushland and coastal weed infestations	GTCMG Weeds Steering Committee - may require outside support and expertise e.g. Tamar NRM, consultants.	January 2014
Develop a comprehensive weed list for the nominated area	GTCMG Weeds Steering Committee	January 2014
Identify and prioritise areas of high cultural and ecological conservation value	GTCMG Weeds Steering Committee	January 2014
Identify, map and prioritise weed species	GTCMG Weeds Steering Committee - May require outside expertise e.g. Tamar NRM, consultants	January 2014
Develop informal management arrangements (if needed)	GTCMG Weeds Steering Committee	April 2014
Identify available and potential labour resources for weed eradication works	GTCMG Weeds Steering Committee	January 2014
Identify potential funding resources for weed eradication works	GTCMG Weeds Steering Committee, GTCMG, Tamar NRM, George Town Council	December 2013
Develop a prioritised Weeds Action Plan	GTCMG Weeds Steering Committee with support from Tamar NRM	April 2014
Commence prioritised weed activities	Local volunteers	April 2014
Train Conservation Committees in weed identification, native plant identification and techniques for weed eradication	DPIPWE, Tamar NRM Weeds Working Group	June 2014
Development and maintenance an inventory and herbarium of native and introduced plants	Tamar NRM	December 2014
Undertake a botanical/habitat survey of the Reserve (including vertebrates, invertebrates and other organisms such as fungi)	Tamar NRM	February 2014
Propose, design and prepare information signage	GTCMG in consultation with George Town Council	February 2014

4. MANAGEMENT GUIDELINES

4.1 CONSERVATION AND RESTORATION

4.1.1 WEEDS

Environmental weeds are plants that have the potential to invade and cause significant impacts in native habitats and ecosystems. A previously developed report by Wind and Luxton (2002) contains an action plan to provide guidance for the working bees of the Landcare group. Environmental weeds can degrade native habitats and reduce biodiversity by competing with the local plant species for light, nutrients, water, space and/or pollinators.

Environmental weeds can:

- Impede, suppress and exclude local native plant species;
- Prevent regeneration by local native plants species;
- Disrupt and displace local animal species by reducing the availability of suitable habitat;
- Enhance habitat conditions for introduced pest animals;
- Change ecological and physical processes such as fire regimes and soil chemistry;
- Change geomorphological features through increased soil erosion or altered
- sedimentation rates;
- Pollute gene pools of local species through hybridisation 23.

Several of the environmental weed species found along the coast are Declared Weeds. Declared Weeds are deemed as such by a Weed Management (Declared Weeds) Order because they have an adverse impact on Tasmania's productive capacity, natural or physical resources, genetic diversity or genetic integrity of a native plant species and/or the maintenance of indigenous ecological processes. Nature conservation social and economic impacts are also taken into consideration. By law owners may be required to take measures within a certain time to control or eradicate a Declared Weed.

A report provided for Tamar NRM by Bushways Environmental Services –Tasmania (*Site Assessments and Vegetation Management Advice For Envirofund Project at Weymouth*, December 2004) identifies the presence of the following declared and other environmental weeds (note not in prioritised order):

- Spanish Heath (*Erica lusitanica*)
- Blackberry (*Rubus fruticosus*)
- Boneseed (*Chrysanthemoides monilifera)*
- Cotoneaster (*Cotoneaster glaucophyllus*)
- Watsonia (*Watsonia spp*)
- Pampas grass (Cortaderia spp.)
- Asparagus fern (*Asparagus densiflorus*)
- Briar rose (*Rosa rubiginosa*)
- Sea wheat-grass (*Thinopyrum junceiforme*)
- Sea spurge (*Euphorbia paralias*)

Some other plant species in the bushland and coastal locations are considered to be undesirable as they detract from the aesthetics of the native bush, are obtrusive by their size, shape or colour, or may be sleeper weeds. Sleeper weeds are species that may have potential to be environmental weeds but as yet have not experienced the right environmental circumstance to expand and impact on the native habitat.

Plants considered to be undesirable include:

- African Lily (*Agapanthus praecox*)
- Hydrangea (*Hydrangea*)
- Daffodils (*Narcissus*)
- Agave (*Agave americana*)
- Belladonna (*Amaryllis belladonna*)
- Daisy (*Osteospermum*)
- Lions Ear (*Leonotis leonurus*)
- Geranium (*Pelargonium* X *asperum*)

Prioritising Weed Species

Regional weed strategies provide a list of the plants posing significant threat to the region including species which currently have no or limited distribution within the region, but which, should they gain foothold could be expected to have a dramatic, negative effect of natural values and primary production. These include plants such as Serrated Tussock and Paterson's curse. Other plant species present within the northern NRM region may have no or limited presence within the coastal strip. Species in each of these categories warrant the highest priority for local eradication to prevent establishment.

Declared Weeds

Under provisions of the *Weed Management Act 1999* each declared weed is deemed Zone A (eradication) or Zone B (control) in each municipal area. For example gorse is Zone A in Dorset where there are few known sites and eradication is feasible, but Zone B in Northern Midlands where the plant is very widespread.

BRIDAL CREEPER, BRIDAL VEIL (*ASPARAGUS ASPARAGOIDES*)

- Legal status. A "Zone A" declared weed in all Tasmanian municipal areas under the *Weed Management Act 1999*. It therefore requires eradication.
- Bridal Creeper is a Weed of National Significance (WoNS). Populations of this plant in Tasmania are regarded as outlier populations nationally (i.e. relatively small infestations by national standards) and as a result major eradication programs have been implemented in Tasmania over the preceding 6-8 years to eradicate this species. Bridal creeper has been a high priority species for annual funded works by NRM-North in this region.

Bridal Creeper was introduced from Southern Africa for ornamental purposes. It can be highly invasive in coastal areas and is capable of eliminating all native ground layer species and small shrubs, and prevents overstorey regeneration. Scattered populations are found across northern Tasmania. Bridal Creeper can produce over 1000 seeds per annum and most buried seeds germinate. The tuber provides a ready source of shoot buds along the underground rhizome. Bridal Creeper infestations are usually difficult to control and plants grow amongst the roots of native plants making removal and herbicide treatment problematic.

Native plants that can be confused with this weed:

- Avoid confusion with native plant species. Apple-berry (*Billardiera scandens*), Climbing Lignum (*Muehlenbeckia adpressa*), Australian Clematis (*Clematis aristata)* and Small leafed Clematis (*Clematis microphylla*) occur in the Reserve and can be mistaken for Bridal Creeper.

Management Guidelines:

- The WoNS Bridal Creeper Best Practice Management Plan provides excellent guidance for managing this species. DPIPWE also has a 'weed note' which provides the range of management options including herbicide advice.

- Bridal creeper is a winter active species requiring management during winter months. Seedlings and small infestations can be dug out when soils are moist. Fertile material needs to be disposed of through deep burial as quarantined weed waste at an appropriate waste management facility and treated areas monitored for regrowth over the following year. Where there is no native flora, infestations can be scalped deep enough to remove tuber mass. Plants can be sprayed with non-selective or selective herbicides but repeated applications may be necessary over several years (Bush Invaders of South-East Australia P 126-128).
- There is currently a regional eradication program underway with all known infestations under management at the time of writing. If you find this weed contact Tamar NRM.

ASPARAGUS FERN (*ASPARAGUS SCANDENS*)

- No known infestations in the Region. Zone A. Contact Tamar NRM with any sightings of this weed.

BONESEED (*CHRYSANTHEMOIDES MONILIFERA*)

- Legal status. Due to the success of community driven eradication projects the Tamar Region's municipalities have recently been upgraded to Zone A for Boneseed.
- Also a WONS and also the subject of major funded programs including Tamar NRM's annual, highly successful "Boneseed Blitz".
- The launch of the Tamar Region Boneseed Eradication Strategy (March 2013) to be implemented by Tamar NRM's Weed Working Group will coordinate and prioritise activities and will support eradication of Boneseed from the coastal communities.

Boneseed originates from South Africa. It was introduced for ornamental use and is now widespread in northern and eastern Tasmania. Boneseed is highly invasive in coastal areas and dry forest/woodland habitats. It has the potential to completely dominate invaded habitats with dense stands eliminating indigenous ground layer species and overstorey regeneration. Boneseed is hardy and thrives in disturbed areas on poor soil types. A single plant can produce up to 50,000 seeds annually which can survive in the soil for up to 10 years. Mass germination can be induced by fire though plants and surface seeds are killed by fire.

Native plants that can be confused with this weed:

- Avoid confusion with native plant species. Parrots Food (*Goodenia ovata*) can be mistaken for Boneseed in its juvenile stage and False Boobyalla (*Myoporum insulare*) when not in flower.

Management Guidelines:

- A WoNS Best Practice Manual exists for this species as does an updated (2010) DPIPWE "Weed Note" which provides comprehensive management advice'.
- One fortunate feature of this species is that plants are poorly rooted. Seedlings and small plants can be hand pulled. Large plants can be treated using the Cut-Paint method.

PAMPAS GRASSES (*Cortaderia* species)

There are three species of pampas in Tasmania: *Cortaderia selloana,* common pampas grass*, C. jubata,* pink pampas, and *C. richardii*, toe toe. Their features are similar so for practical purposes they are treated as one weed. All are large, vigorous, dense, tussocky perennials. Pampas is an aggressive environmental weed and is a **declared weed** in Tasmania under the Tasmanian *Weed Management Act 1999*. The importation, sale and distribution of pampas are prohibited in Tasmania

- Legal status. A " Zone A" declared weed in all Tasmanian municipal areas under the *Weed Management Act 1999*. It therefore requires eradication.

Pampas Grass is a Weed of National Significance (WoNS). Populations of this plant in Tasmania are regarded as outlier populations nationally (i.e. relatively small infestations by national standards).

BLACKBERRY (*RUBUS FRUTICOSUS*)

- Legal status. A "Zone B" declared weed in the Tamar municipal areas under the *Weed Management Act 1999*. It therefore requires control including 10 metre buffers from neighbouring landholders.
- Blackberry while also a WoNS is widespread in Tasmania and has not been the subject of large funded projects here.

Blackberry is a widespread species and highly invasive in a range of native habitats. Blackberry thickets exclude nearly all indigenous plants and destroy animal habitat. Thickets provide shelter for introduced species such as rabbits but also for some small native ground dwelling mammals such as bandicoots and some small birds. Reproduction is by seed, root suckers, roots and daughter plants.

Native plants that can be confused with this weed:

Blackberry is likely to be confused with indigenous *Rubus* spp. Native Raspberry (*Rubus parvifolius*) is recorded in the coastal region.

Management Guidelines:

- A WoNS Best Practice Manual exists for this species as does an updated (2010) DPIPWE "Weed Note" which provides comprehensive management advice'
- Early attention and eradication of infestations is recommended.
- Seedlings and small plants can be dug out and areas monitored for regrowth. Dispose of fertile material in accordance with DPIPWE weed note. Small infestations can be treated using the Cut-Paint method.
- A woody weed herbicide is necessary (refer DPIPWE guidelines).

GORSE (*ULEX EUROPAEUS*)

- Legal status. A "Zone B" declared weed in the Tamar municipal areas under the *Weed Management Act 1999*. It therefore requires control including 5 metre buffers from neighbouring landholders.
- Gorse while also a WoNS is widespread in much of Tasmania and has not been the subject of large funded projects in the Tamar Region.

Gorse is commonly associated with agricultural and degraded landscapes but can invade dry coastal vegetation and a range of other native habitats. Flowering generally occurs over autumn and again over late winter-spring. Reproduction is by seed and procumbent branches can send out adventitious roots. Huge amounts of seed can be produced. Early seedling growth can be rapid and plants may flower after 18 months. Plants resprout after fire and mass germination of seed may occur. Seeds and plants are long-lived and seeds may be viable for up to 30 years.

Management Guidelines:

- A WoNS Best Practice Manual exists for this species as does an updated (2010) DPIPWE "Weed Note" which provides comprehensive management advice'

Seedlings and smaller plants can be hand pulled or dug out. Ensure roots do not remain. Plants can be treated using the Cut-Paint method. Dispose of fertile material. Small plants branch vigorously at ground level making them difficult to cut back and herbicide sprays may be more practical. Biocontrol methods are proving useful in Tasmania. Eradication is a long-term task due to the abundance and viability of the seed bank.

SPANISH HEATH (*ERICA LUSITANICA*)

- Legal status. A "Zone B" declared weed in the Tamar municipal areas under the *Weed Management Act 1999*. It therefore requires control including 50 metre buffers from neighbouring landholders.

Spanish Heath was introduced from southwest Europe for ornamental purposes. It is highly invasive in a range of native habitats and extensive infestations occur in Tasmania. It is capable of completely dominating the shrub canopy layer and is often associated with disturbance. Spanish Heath tolerates grazing, trampling, slashing and drought.

Native plants that can be confused with this weed:

- 'Spanish Heath may be confused with native Heath (*Epacris impressa).*

Management Guidelines:

- An updated (2010) DPIPWE "Weed Note" provides comprehensive management advice.
- Early attention is recommended to eradicate this species.
- Seedlings and small plants can be hand pulled or dug out. Plants can be treated using the Cut-Paint method.

AFRICAN BOXTHORN, BOXTHORN (*LYCIUM FEROCISSIMUM*)

- Legal status. A "Zone B" declared weed in the Tamar municipal areas under the *Weed Management Act 1999*. It therefore requires control including 50 metre buffers from neighbouring landholders.
- African Boxthorn has been added to the WoNS list and a National strategic Plan and Best Practice Manual for management of this weed are under development at the time of writing.
- With sufficient community action the Tamar Region is a good candidate for upgrading to Zone A for African Boxthorn.
- The addition of African Boxthorn to the WoNS lists creates and opportunity to strategically target this species, as it is likely that associated projects will attract Federal Government funding and it is in sufficiently low densities that eradication is feasible as an objective.

African Boxthorn was introduced from southern Africa for hedging purposes. It is a particularly common invader of coastal vegetation. It shades and crowds out native vegetation preventing regeneration. African Boxthorn is a very hardy species and can reshoot from the base or produce root suckers when top growth is damaged or removed. Reproduction is mainly by seed.

Native plants that can be confused with this weed:

African Boxthorn can be confused with Coast Beard-heath (*Leucopogon australis*) and Prickly Box (*Bursaria spinosa*) in the Reserve.

Management Guidelines:

- An updated (2010) DPIPWE "Weed Note" provides comprehensive management advice including herbicide.
- Eradication of this species from the Reserve is recommended.
- Seedlings and small plants can be hand pulled or dug out. Plants can be treated using the Drill-Fill or Cut-Paint methods. Cut material should be disposed of carefully (Bush Invaders of South-East Australia P 199-200).

BRIAR ROSE, SWEET BRIAR ROSE (*ROSA RUBIGINOSA*)

Briar Rose was introduced from the northern hemisphere for hedging and ornamental purposes. Large infestations are known in Tasmania in grasslands, pasturelands woodlands and riparian habitats. Briar Rose does well in sunny situations where there is little grazing and competition. Plants

commonly form thickets and make passage difficult. They crowd out native shrubs and prevent overstorey regeneration. Briar rose flowers after about 3 years and seeds may be viable for 3 to 4 years in the soil. Reproduction is by seed, suckers, root and crown fragments.

Management Guidelines:

- Adjacent farmland provides an ongoing source for reinfestation.
- Small plants can be dug out but ensure crown is removed. Plants can be treated using the Cut-Paint method best applied before fruit develops.

ENGLISH BROOM, SCOTCH BROOM, SPANISH BROOM (*CYTISUS SCOPARIUS*)

Cytisus scoparius has been announced as a WoNS. It is relatively low density and is a potential target for upgrade to Zone A with eradication in the region.

English Broom originates from Europe and was introduced for ornamental uses. It is highly invasive in a range of native habitats and pastureland. It can transform the invaded habitats by reducing the diversity of ground layer species and prevent regeneration of shrub and forest canopy layer species. English Broom tolerates frosts and summer droughts but will not grow in heavily shaded or swampy places. Germination is encouraged by fire. Seeds can remain dormant in the soil for at least 20 years resulting in the accumulation of large viable seed banks.

Management Guidelines:

- Seedlings and smaller plants can be hand pulled or dug out being careful to get roots.
- Plants can be treated using the Cut-Paint method. Ensure removal of fertile material.

CAPE BROOM, MONTPELLIER BROOM (*GENISTA MONSPESSULANA*)

Genista Monspessulana has been announced as a WoNS. It is relatively low density and is a potential target for upgrade to Zone A with eradication in the region.

Cape Broom originates from the northern hemisphere and has been introduced and widely cultivated as a garden ornamental and hedging plant. It invades a wide variety of natural habitats including forest margins, dry coastal vegetation, heathlands, healthy woodlands, grasslands, grassy woodlands, open woodlands, damp sclerophyll forests, riparian vegetation and rock outcrop vegetation. Infestations shade and out-compete smaller shrubs and groundcover species, eventually replacing them and severely impeding the regeneration of overstorey plants. Such infestations are likely to have a major impact on the food sources of native fauna as well as reducing plant biodiversity. This species reproduces only by seed. These seeds are dispersed short distances (up to 3 m) when they are ejected from the mature pods. Longer distance dispersal can occur via vehicles, machinery, water, birds and other animals, and also in contaminated agricultural produce, soil and dumped garden waste.

Management Guidelines:

- Small plants can be hand pulled or grubbed in spring when the ground is soft.
- Cutting seedlings when they are 5 to 10 cm high can provide effective control of regenerating plants.
- Larger shrubs should be cut close to ground level and the stumps painted with herbicide.

SERRATED TUSSOCK (*NASSELLA TRICHOTOMA*)

Serrated tussock is a perennial grass native to South America. It is a serious weed of pastures and native grasslands. Serrated tussock is similar to several of Tasmania's native tussock grasses, and is frequently overlooked until it begins to flower, at which time it is more easily recognisable. In Tasmania it is a significant weed of grazing land. The coarse leaves of serrated tussock are unpalatable, and dense infestations in pasture can completely smother all other desirable pasture

species, rendering large areas incapable of supporting livestock. Serrated tussock threatens the biodiversity values of Tasmania's native grasslands, displacing native species and often going undetected until infestations reach a large size. Serrated tussock will also invade other vegetation types such as grassy woodlands, and coastal communities.

Serrated tussock is spread by wind. As the seeds mature, the flower-head stalk becomes brittle, so that a strong wind can break off the whole head. The flower head is then blown along until it lodges against an obstacle where it releases the seeds. The flower head is extremely light and can be blown considerable distances. A hectare of serrated tussock can produce over 2 tonnes of seed or about 500 million seeds. Serrated tussock seed can also catch on the fleece of sheep, as well as be carried in mud on the hooves of livestock and implements, on vehicle tyres, and on firewood. Seed may remain dormant for several years (anecdotal reports state 20 years, but it may be significantly shorter) so an area which appears to have been cleared of the weed may produce seedlings when the soil is later disturbed.

An integrated partnership between Tamar NRM and the Launceston City, West Tamar and George Town Councils declared the Tamar Region a 'Serrated Tussock Free Zone'. Under current agreements eradication is the target with a priority to prevent infestation and establishment.

Management Guidelines:

- All control programs should aim at reducing the amount of serrated tussock available to germinate. When starting on a control program it is best to start on the prevailing upwind side of a serrated tussock infestation to try and limit the amount of seed blowing into control areas.
- Serrated tussock seeds can only travel small distances on flat ground because they get caught up in fences and other grasses. But on hills, serrated tussock seeds are launched and will fly for many kilometres. These areas should be a priority for control works.
  The principles and methods of serrated tussock control are:
  a) Prevention
  b) Chipping or spot spraying individual plants and small patches
  c) Controlling large infestations
  d) Replacing dead tussock with improved perennial pasture
  e) Maintaining a competitive perennial pasture
  f) Alternative measures
  g) Continual follow up

Non-Declared Weeds

POLYGALA, PARROT BUSH OR MYRTLE-LEAF MILKWORT (*POLYGALA MYRTIFOLIA*)

Polygala originates from South Africa and was introduced as an ornamental plant. It is highly invasive in coastal habitats and is able to build up large populations rapidly. Plants are tolerant of salt winds and exposed situations. It can flower when less than 50 cm high. Seeds can remain viable in the soil for at least three years and can geminate readily in both shade and full sun. Mass germination can occur following soil or canopy disturbance. Polygala has the potential to produce dense, mixed age thickets that totally dominate the shrub canopy and prevent overstorey regeneration.

Management Guidelines:

- Avoid confusion with native plant species. Seedlings of Polygala may be confused with Coast Tea-tree (*Leptospermum laevigatum*) and Coast Beard-heath (*Leucopogon parviflorus*).
- Infestations on neighbouring land provide an ongoing source for reinfestation.
- Seedlings and small plants can be hand pulled. Large plants can be dug out or cut down as they rarely reshoot. Cut down where erosion is likely. Dispose of fruit safely.
- Seedlings need to be pulled for at least three years.

BLUE PSORALEA, BLUE BUTTERFLY BUSH (*PSORALEA PINNATA*)

Blue Psoralea originates from South Africa and was introduced as an ornamental plant. It is a garden escape in coastal and near coastal areas. There are large infestations in northern Tasmania around the fringes of coastal settlements. It can tolerate exposed coastal grow in partial shade. Blue Psoralea can reach maturity within three years and live for around 10-15 years. Thousands of seeds can be produced annually which can remain dormant in the soil for more than eight years. Disturbance around infestations can stimulate mass germination. Blue Psoralea can increase soil fertility and impact on neighbouring native plant species. Infestations can shade out some ground flora plants, crowd out shrubs and impede overstorey regeneration.

Management Guidelines:

- Ongoing control is recommended.
- Infestations on neighbouring land provide an ongoing source for reinfestation
- Seedlings and small plants can be hand pulled or dug out. Ensure roots are retrieved. Younger plants can be treated using the Cut-Paint or Drill-Fill methods. Older plants do not reshoot so can be cut down or ringbarked. Eradication can take several years because of the long-lived and abundant seed bank.

SEA WHEATGRASS (*THINOPYRUM JUNCEIFORME*)

Sea Wheatgrass originates from Europe and was introduced to mainland Australia as a dune stabiliser. It was probably not deliberately introduced to Tasmania from the mainland but arrived naturally by sea dispersal. It is rhizomatous and grows rapidly. Sea Wheatgrass traps sand and builds up dunes and does this job along side Marram Grass in its native Europe. In Tasmania it is responsible for altering the structure of the beach and foredunes, and the elimination of native species such as *Atriplex billardierei* and *Carex pumila*.

Management Guidelines:

- Control of Sea Wheatgrass is recommended. The control strategy must consider potential impacts on nesting shorebirds.
- Sea Wheatgrass can be controlled by herbicide but three or more treatments may be necessary.

SEA SPURGE (*EUPHORBIA PARALIAS*)

Sea Spurge originates from the northern hemisphere. The invasion of this species along the southern Australian coastline is rapidly gaining momentum with many unaffected beaches now being invaded as ocean currents spread. Sea Spurge invades coastal vegetation including frontal dunes, strandline and unstable coastal dunes and colonises primary sand dunes extending inland from the strandline. It is highly tolerant of salt water, wind, sand blast and full sun. Early growth is rapid and seeds may be buoyant in salt water for over 8 years. Mass germination occurs in spring-summer and young plants form a taproot very quickly. It can also spread by root fragments.

Management Guidelines:

- Control can be a long term prospect and is difficult to maintain without a long-term strategy. The control strategy must consider potential impacts on nesting shorebirds.
- Stimulate closure of canopies of Boobyalla and Swamp Paperbark. Ecological gaps lead to weed expansion.
- When removing sea spurge all due care must be take in transportation of weeds off site.
- To ensure seeds are not spread via transportation.

THREE-CORNERED GARLIC, ANGLED ONION (*ALLIUM TRIQUETRUM*)

Three-cornered Garlic originates from the Mediterranean region. It is common in disturbed and degraded environments and is often associated with drainage lines and the disturbed edges of woodlands and forests. Three-cornered Garlic is a tenacious and persistent species that is capable of dominating the ground layer where conditions are suitable. Reproduction is vegetative by bulbs or by seed. The seed is copious and short lived, losing viability after a year

Management Guidelines:

The garlic like aroma of the leaves distinguishes Three-cornered Garlic from native species. Plants can be dug out when soil is moist to ensure collection of all bulbs. Dispose of material carefully. Stands can be slashed to ground level during early flowering period. Ongoing treatment within and between seasons will probably be necessary. Stands can be treated with herbicides.

TREE LUCERNE (*CHAMAECYTISUS PALMENSIS*)

Tree Lucerne originates from the Canary Islands and was introduced for fodder and ornamental uses. It invades a variety of native bush including woodlands, forests, heathlands and riparian habitats. It is fast growing and tolerates exposed situations and low nutrient soils. Thousands of seeds are produced yearly which can be exploded several metres from the plant. Disturbance generally stimulates mass germination. Tree Lucerne also increases soil fertility influencing the survival of native species.

Management Guidelines:

- Early eradication is recommended.
- Seedlings and smaller plants can be hand pulled or dug out being careful to get roots.
- Plants can be treated using the Cut-Paint method. Ensure removal of fertile material.

MIRROR BUSH, SHINING COPROSMA (*COPROSMA REPENS*)

Mirror Bush was introduced from New Zealand for ornamental uses. It commonly invades coastal bushland environments as well as other habitats. It is tolerant of sea spray, strong wind, salt, exposed positions, drought, frost, fire and most soil types. Growth is dense and canopy can smother most other plant species. Even quite small plants are able to regenerate from rootstock. It spreads by seed and by rooting of lower branches.

Management Guidelines:

- Local eradication of Mirror Bush is recommended.
- Infestations could be easily removed. Seedlings and saplings can be dug out and mature plants can be treated using the Cut-Paint, Drill-Fill or Frilling methods.

MARRAM GRASS (*AMMOPHILA ARENARIA*)

Marram Grass is a perennial grass that grows in coastal sands. It was introduced into Tasmania from Europe to stabilise coastal dunes. It is very effective at trapping sand and grows vigorously. Marram Grass has spread from dune stabilisation projects to invade other areas of coastline. It develops deep and extensive rhizomes and produces dense clumps of grass to a metre or so high which dominate plant communities and entrap sand. It is more vigorous where sands are mobile, covering the plant and stimulating growth, similarly burning promotes healthy and dense growth. Where it occurs on sands that are not disturbed native species such as coastal wattle (*Acacia sophorae*) can establish if there is a seed source and gradually shade out the Marram Grass. However in the beach environment this does not happen and it is here where some very significant environmental impacts are occurring.

Management Guidelines:

- Early eradication is recommended.

- Remove entire plants.

BLUE PERIWINKLE *(VINCA MAJOR)*

Blue Periwinkle originates from the Mediterranean region and was introduced for ornamental purposes. It has become a serious problem in native ecosystems, particularly in damp and seasonally moist sites. Most reproduction appears to be vegetative where stems root readily when they touch the ground. Blue Periwinkle forms dense low mats that smother native plants in the ground layer and prevent shrub and tree species regeneration.

Management Guidelines:

- Adjacent properties provide an ongoing source for reinfestation.
- Seedlings can be hand pulled and small infestations can be dug out. Ensure all material is removed and disposed of carefully. Accessible infestations can be slashed or mown near ground level in winter-early spring. Remove cut pieces. Herbicides can be used in the warmer months but repeated treatments may be necessary over several years.

MONTBRETIA (*CROCOSMIA X CROCOSMIIFLORA*)

Montbretia has become highly invasive in some parts of Tasmania commonly invading forests and woodlands, roadside remnants, drainage lines and creek banks. It forms closed stands crowding out other groundcover species and preventing overstorey regeneration. Plants can produce hundreds of seeds annually and corms can reshoot for at least two seasons. Corms are the primary means of dispersal.

Management Guidelines:

- Infestations on neighbouring land provide an ongoing source for reinfestation.
- Plants can be dug out when the soil is moist to avoid dislodging corms. Dispose of material carefully. Cutting off and removing seed heads in the autumn can contain infestations. Individual plants can be treated with herbicides as stems emerge.

WATSONIA, WILD WATSONIA, BUGLE LILY (*WATSONIA MERIANA*)

Watsonia is a highly invasive species found in a variety of habitats including coastal and grassy woodlands, heathlands, forests and riparian habitats. Like Montbretia, Watsonia forms dense stands that can dominate the ground layer and inhibit overstorey regeneration. Stem bulbils are the primary means of dispersal.

Management Guidelines:

- It is most prevalent in areas that have been cleared, and maintained as clearings or cultivated by adjacent landowners.
- Infestations on neighbouring land provide an ongoing source for reinfestation.
- Plants can be dug out when the soil is moist to avoid dislodging corms. Cutting off and removing seed heads in the summer-autumn can contain infestations. Individual plants can be treated with herbicides in spring before new corms develop.

WILD GLADIOLUS (*GLADIOLUS UNDULATES*)

Wild Gladiolus originates from South Africa and was introduced for ornamental purposes. It reproduces vegetatively by numerous underground bulbils and corms. Hundreds of corms can be produced by each bulb which are tiny and easily spread.

Management Guidelines:

- Infestations on neighbouring land provide an ongoing source for reinfestation.
- Plants can be dug out when the soil is moist to avoid dislodging corms.

PARIS DAISY, WINTER EURYOPS (*EURYOPS ABROTANIFOLIUS*)

This species was introduced from South Africa. It is a garden escape that is spreading in native bush in Tasmania, particularly in sandy heaths.

Management Guidelines:

- Early eradication is recommended while the infestation is localised.
- Individual plants can be hand pulled or dug out.

ITALIAN BUCKTHORN, BUCKTHORN (*RHAMNUS ALATERNUS*)

Italian Buckthorn originates from the Mediterranean region and was introduced for ornamental and hedging purposes. It is invasive in coastal areas including woodlands and dune systems. Italian Buckthorn is a hardy and adaptable species that is quick growing and suckers readily from the base and shoots. It reproduced by seed and suckers. It is not generally killed by fire or by cutting trunks.

Management Guidelines:

- Italian Buckthorn can be confused with Sea Box (*Alyxia buxifolia*).
- Eradication of Italian Buckthorn is recommended.
- Seedlings and small plants can be hand pulled or dug out. Plants can be treated using
- Cut-Paint and Drill-Fill methods. Treatments are best applied in spring-early summer,
- before fruit develops.

ARUM LILY, WHITE ARUM LILY (*ZANTEDESCHIA AETHIOPICA*)

Arum Lily originates from South Africa and was introduced for ornamental purposes. It is invasive in coastal and riparian vegetation, pastures, wetlands, degraded areas, rubbish dumps and gardens. It is tolerant of a wide variety of climates from tropical to cold and from sun to shade.

Management Guidelines:

- Adjacent private land provides an ongoing source for reinfestation.
- Eradication of this species is recommended.
- Dig out and remove whole plants.

CAPE WEED, CAPE DANDELION (*ARCTOTHECA CALENDULA*)

Cape Weed originates from South Africa and is a significant weed in Tasmanian pastures. It is particularly common near the sea in highly disturbed areas.

Management Guidelines:

- Eradication of Cape Weed is recommended.
- Hand pull plants where observed.

AFRICAN LILY (*AGAPANTHUS PRAECOX*)

African Lily was introduced from South Africa for ornamental purposes. It forms leafy clumps and reproduces by seed and vegetatively from rhizome growth or fragments. It invades bush and disturbed areas from gardens and can form dense mats that exclude all other species.

Management Guidelines:

- African Lily thrives is most likely to occur in disturbed and cleared areas.
- Eradication of African Lily is recommended.
- Dig out occasional plants.

ENGLISH IVY (*HEDERA HELIX*)

English Ivy was introduced from Europe for ornamental uses. It is highly invasive in riparian vegetation, woodlands and forests. Although it is slow to establish it has the capacity to eliminate most native vegetation.

Management Guidelines:

- Eradication of English Ivy is recommended.
- Seedlings and small rooting stem fragments can be hand pulled or dug out. Trailing stems can be manually removed. Vines growing on shrubs and trees can be severed at the base. On rough barked trees vines may need to be treated using Drill-Fill or Stem-Scrape methods. Climbing infestations should be treated first.

JAPANESE HONEYSUCKLE, HALL'S HONEYSUCKLE *(LONICERA JAPONICA)*

Japanese Honeysuckle originates from China and was introduced for ornamental purposes. It is highly invasive in bushland where its aggressive climbing habit is capable of eliminating all indigenous ground layer species. Reproduction is by seed and stem rooting. Cut stumps reshoot and fruit is relished by birds which spread seed widely.

Management Guidelines:

- Eradication of Japanese Honeysuckle is recommended.
- Seedlings can be hand pulled and small infestations can be manually removed.

SWEET PITTOSPORUM, NATIVE DAPHNE (*PITTOSPORUM UNDULATUM*)

Sweet Pittosporum originates from the east coast of mainland Australia and is very adaptable in a range of native habitats. It has dense foliage that reduces light levels dramatically shading out ground layer species and regeneration of overstorey species. Sweet Pittosporum has very high seed production, rapid dispersal, early seed production and fast growth. It reproduces by seed and by suckers.

Management Guidelines:

- Small infestations can occur.
- Infestations could be easily removed. Seedlings and saplings can be dug out and mature plants can be treated using the Cut-Paint, Drill-Fill or Frilling methods.

CAPE WATTLE, CAPE LEEUWIN WATTLE (*PARASERIANTHES LOPHANTHA*)

Cape Wattle originates from Western Australia and was introduced for ornamental purposes. It is a highly invasive species particularly in dry coastal and near coastal habitats in Tasmania. Fire may kill mature plants but can stimulate mass germination. Cape Wattle is very fast growing and can flower within 12 months.

Management Guidelines:

- Cape Wattle can be confused with Sunshine Wattle (*Acacia terminalis*).
- Cape Wattle can be found in isolated localities and is generally more common in residential areas.
- Early eradication of this species is recommended.
- Seedlings and small plants can be hand pulled, ensuring roots are removed. Young plants can be treated using the Cut-Paint or Drill-fill methods. Old plants do not reshoot so they can be cut down. Fertile material should be removed.

RADIATA PINE, MONTEREY PINE (*PINUS RADIATA*) AND OTHER CONIFERS

Radiata Pine originates from North America and was introduced for forestry purposes, windbreaks and ornamental uses. It invades a variety of native habitats including coastal dunes. Radiata Pine competes effectively with Eucalypts. Stands provide very little in the way of food or shelter for native fauna. Shade and a carpet of needles exclude most native plants.

Management Guidelines:

- Removal of large trees will need to be strategic.
- Seedlings and small plants are easily pulled or dug out. Plants can be cut down or treated using Drill-Fill, Frilling of Ringbarking methods.

BANANA PASSIONFRUIT (*PASSIFLORA MOLLISSIMA*)

Banana Passionfruit was introduced from South America for fruiting and ornamental uses and is highly invasive in damp or seasonally moist places, particularly in coastal and near coastal areas. Invasions often begin along bushland margins and openings, with infestations expanding as the canopy dies and light levels increase. Reproduction is by seed and vegetatively. Seeds can remain dormant for long periods and large seed banks can establish. Banana Passionfruit is fast growing and may live for over 20 years.

Management Guidelines:

- Early eradication is recommended.
- Cut vines at the base. Vines can also be removed manually. Ensure roots are removed and monitor for regrowth.

COTONEASTER (*COTONEASTER* SP.)

Introduced from China for ornamental purposes. It is a hardy species that is invasive in a range of natural habitats, particularly in and around habitation. Mature plants produce abundant fruits that are mostly dispersed by birds.

Management Guidelines:

- Early eradication is recommended.
- Plants reshoot from the base following removal or damage to the top growth.
- The Cut-Paint method can be used effectively on established shrubs. Seedlings and small plants can be hand pulled or dug out.

CLEAVERS, VELCRO PLANT, STICKYWEED (*GALIUM APARINE*)

Cleavers is a global weed of crops. It invades a variety of native and disturbed habitats including dry coastal vegetation. Cleavers is an annual climber and clings to every thing it grows over. Cleavers can germinate at any time of the year and seeds persist on dead plants and retain their ability to cling to fur or clothing.

Management Guidelines:

- Cleavers may be confused with native *Galium* spp.
- Restoration of the native ground layer and reduced disturbance may help to exclude Cleavers.

HOLLY, ENGLISH HOLLY (*ILEX AQUIFOLIUM*)

Holly was introduced from Europe for ornamental uses and is invasive in areas with cool moist climates. Large Hollies can resprout from the stump. Seedling growth is slow and in ideal conditions plants can mature in 5 years. Damage to the root system can result in suckering from large roots. Reproduction is by seed though male and female plants are necessary to produce fruit.

Management Guidelines:

- Remove layered branches from the tree.
- Remove all root material from the area including any remaining roots in the soil.
- Large trees can be treated using Drill-Fill.

GAZANIA, TREASUREFLOWER *(GAZANIA* SP.*)*

Gazania originates from South Africa and was introduced for ornamental purposes. It is a common invader of coastal areas.

Management Guidelines:

- Eradication of this plant is recommended.
- Small infestations can be easily dug out.

OTHER ENVIRONMENTAL WEEDS IN THE COASTAL AREA

The following species are known to impact coastal environments and habitats:
Hawthorn *Crataegus monogyna* (Shrub)
Soursob *Oxalis pes-caprae* (Herb)
Bluebell Creeper *Sollya heterophylla* (Creeper)
Scarlet Pimpernel *Anagallis arvensis* (Herb)
Centaury *Centaurium erythraea* (Herb)
Spear Thistle *Cirsium vulgare* (Herb)
Large-flower Gladiolus *Gladiolus tristus* (Herb)
Yellow Ixia *Ixia maculata* (Herb)
Ribwort *Plantago lanceolata* (Herb)
White Clover *Trifolium repens* (Herb)
Sweet Vernal *Anthoxanthum odoratum* (Grass)
Quaking Grass *Briza maxima* (Grass)
Couch *Cynodon dactylon* (Grass)
Cocksfoot *Dactylis glomerata* (Grass)
Yorkshire Fog *Holcus lanatus* (Grass)
Kikuyu *Pennisetum clandestinum* (Grass)
Toowoomba Canary-grass *Phalaris aquatica* (Grass)
Buffalo Grass *Stentaphrum secundatum* (Grass)

General Guidelines for Environmental Weeds:

- Prepare work plans for localised areas for integrated and strategic treatment of weeds and other identified threats (particularly off-reserve threats).