

Glamorgan Spring Bay Council  
Coles Bay Reserves



**NATIVE FLORA AND FAUNA  
MANAGEMENT PLAN  
2014 - 2019**



## SUMMARY

North Barker Ecosystem Services has developed this five year Native Flora and Fauna Management Plan on behalf of, and in consultation with, Glamorgan Spring Bay Council for the Coles Bay Reserves under their management. The intent of the Plan is to provide Council with a strategic approach to the sustainable management of the vegetation and other natural values within the Reserves.

The Reserves are:

- Coastal Reserve around Coles bay foreshore
- Unnamed Reserve (off Coles Bay Road)
- Rita & Doris Reserve
- Harold Street Reserve
- The Fisheries

All the Reserves include substantial areas of native vegetation but also variously incorporate public facilities and infrastructure.

The TASVEG native vegetation communities present across all Reserves include:

- *Eucalyptus ovata* forest (DOV)
- *Eucalyptus ovata* heathy forest (DOW)
- *Eucalyptus globulus* dry forest (DGL)
- *Eucalyptus viminalis*- *Eucalyptus globulus* coastal forest (DVC)
- *Eucalyptus amygdalina* coastal forest (DAC)
- *Callitris rhomboidea* forest (NCR)
- *Allocasuarina verticillata* forest (NAV)
- *Acacia longifolia* coastal scrub (SAC)
- Wet heathland (SHW)
- Heathland on granite (SHG)
- Coastal grass and herbfield (GHC).

Five of these (DOV, DOW, DGL, DVC and NCR) are listed as threatened communities under the *Nature Conservation Act 2002*.

Other TASVEG non-native vegetation mapping units present are:

- Lichen lithosere (ORO) – the rocky foreshore
- Sand, mud (OSM) – sandy beaches
- Water, sea (OAQ) – small bays along the foreshore.
- Marram grassland (FMG)
- Urban areas (FUR).

Seven threatened plant species variously listed under the Tasmanian *Threatened Species Protection Act 1995* (TSPA) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) are present in the Reserves:

- *Brachyloma depressum* (TSPA: Rare)
- *Caustis pentandra* (TSPA: Rare)
- *Conospermum hookeri* (TSPA & EPBCA: Vulnerable)
- *Spyridium vexilliferum* var. *vexilliferum* (TSPA: Rare)
- *Thryptomene micrantha* (TSPA: Vulnerable)
- *Xanthorrhoea arenaria* (TSPA & EPBCA: Vulnerable)
- *Zieria littoralis* (TSPA: Rare).

Generally the vegetation is in good to excellent condition and provides a diversity of habitat for native fauna. Threatened fauna species which may utilise nesting and/or

foraging habitat in the vicinity include the new-holland mouse, Tasmanian devil, spotted-tailed quoll, white-bellied sea-eagle and swift parrot.

Notable weeds are mapped and described. These include 3 species of ‘declared weeds’ under the *Weed Management Act 1999* and 30 other species considered as environmental weeds.

Management issues identified include:

- Native vegetation, flora, fauna and significant trees
- Weeds
- Illegal clearing of vegetation
- Reserve boundaries
- Coastal erosion
- Plantings and revegetation
- Fire

Recommendations and actions plans are provided to deal with these issues and guide management of the Reserves for all of their natural values whilst not compromising their associated cultural and social values.



## **ACKNOWLEDGMENTS**

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\*Maps in this publication have been reduced from their original A3 format. Hard copies of A3 maps are available upon request from:

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# **1. INTRODUCTION**

## **1.1 BACKGROUND**

North Barker Ecosystem Services has developed this five year Native Flora and Fauna Management Plan on behalf of, and in consultation with, Glamorgan Spring Bay Council for the Coles Bay Reserves under their management. The intent of the Plan is to provide Council with a strategic approach to the management of the Reserves' natural values whilst recognising and considering the Reserves' significant cultural and social values.

Therefore the main objectives of the Plan are to:

- Identify the natural, and associated cultural and social values of the Reserves,
- Identify threats to the natural values,
- Provide action plans to ensure that the Reserves are sustainably managed to preserve and enhance all of their natural values, in accordance with the Tasmanian Reserve Management Code of Practice 2003<sup>1</sup>, whilst not compromising their cultural and social values, and
- Raise community awareness of the values of the Reserves and thereby encourage participation in activities that minimise threats to their values.

## **1.2 GENERAL DESCRIPTION OF THE RESERVES**

Coles Bay is situated on the central east coast, in the Glamorgan Spring Bay municipality and in the Tasmanian South East bioregion<sup>2</sup>. It occurs in the dry subhumid warm climatic zone where the annual average rainfall is in the region of 600 mm. The altitude across all the Reserves ranges from sea level to approximately 25 m a.s.l.

The Reserves include four within the immediate vicinity of the town of Coles Bay and one, The Fisheries, approximately 2 km directly south of the town. The general locations of the Reserves are depicted in Figures 1a, 1b and 1c. They are briefly described below and more detailed descriptions of the vegetation and their other characteristics are provided in Sections 2 and 3.

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<sup>1</sup> Parks and Wildlife Service, Forestry Tasmania and Department of Primary Industries, Water and Environment 2003.

<sup>2</sup> IBRA5 – Peters & Thackway 1998. A bioregion is an area of land with similar environmental, physical and climatic conditions and containing characteristic ecosystems.

### **Coastal Reserve**

*PID:* 1710282

*Extent (ha):* 12.9

*Land tenure:* Coles Bay Conservation Area, Nature Conservation Act, Parks and Wildlife Service

*Management responsibilities:* No current lease or license – previously held by Council.

*Natural features:* Coastal vegetation including dry sclerophyll forest, non-eucalypt forest and non-forest communities, creek, rocky and sandy shores and bays, parkland with remnant native trees.

*Infrastructure & uses:* Public roads, private property access roads & cross-overs, parking areas, informal walking tracks, BBQ & picnic tables, public toilets, boat ramps & jetties, electricity supply poles & cables.

### **Unnamed Reserve (off Coles Bay Rd)**

*PID:* 1769970

*Extent (ha):* 2

*Land tenure:* Public Reserve, Crown Lands Act, DPIPW

*Management:* Crown License – Glamorgan Spring Bay Council

*Natural features:* Dry sclerophyll forest and heathland communities contiguous on all sides with similar native vegetation.

*Infrastructure & uses:* Fencing around perimeter.

### **Rita & Doris Reserve**

*PID:* 1703314

*Extent (ha):* 2

*Land tenure:* Public Reserve, Crown Lands Act, DPIPW

*Management:* Crown Lease – Glamorgan Spring Bay Council

*Natural features:* Dry sclerophyll forest and heathland communities, granite outcrops.

*Infrastructure & uses:* Informal walking tracks, picnic tables with vehicular access & parking, lookout platform, Council depot shed.

### **Harold St Reserve**

*PID:* 5288285

*Extent (ha):* 2.5

*Land tenure:* Authority Land, Crown Lands Act, DPIPW

*Management:* Crown Lease – Glamorgan Spring Bay Council

*Natural features:* Non-eucalypt forest and parkland with remnant native trees.

*Infrastructure & uses:* Community hall, public tennis courts & toilets with gravel access roads, cross-overs & parking, BBQ & picnic tables, children's playground, ambulance and fire stations with cross-overs, informal walking tracks.

### **The Fisheries**

*PID:* 1805898 plus road reserve with no PID      *Extent (ha):* Foreshore–0.7; road reserve–0.5

*Land tenure:* Coastal and road reserve - Glamorgan Spring Bay Council

*Management:* Glamorgan Spring Bay Council

*Natural features:* Coastal vegetation including dry sclerophyll forest and non-eucalypt forest, creek, rocky and sandy shores.

*Infrastructure & uses:* Public road, private property cross-overs, informal walking track, boatshed & ramp, electricity supply poles & cables.





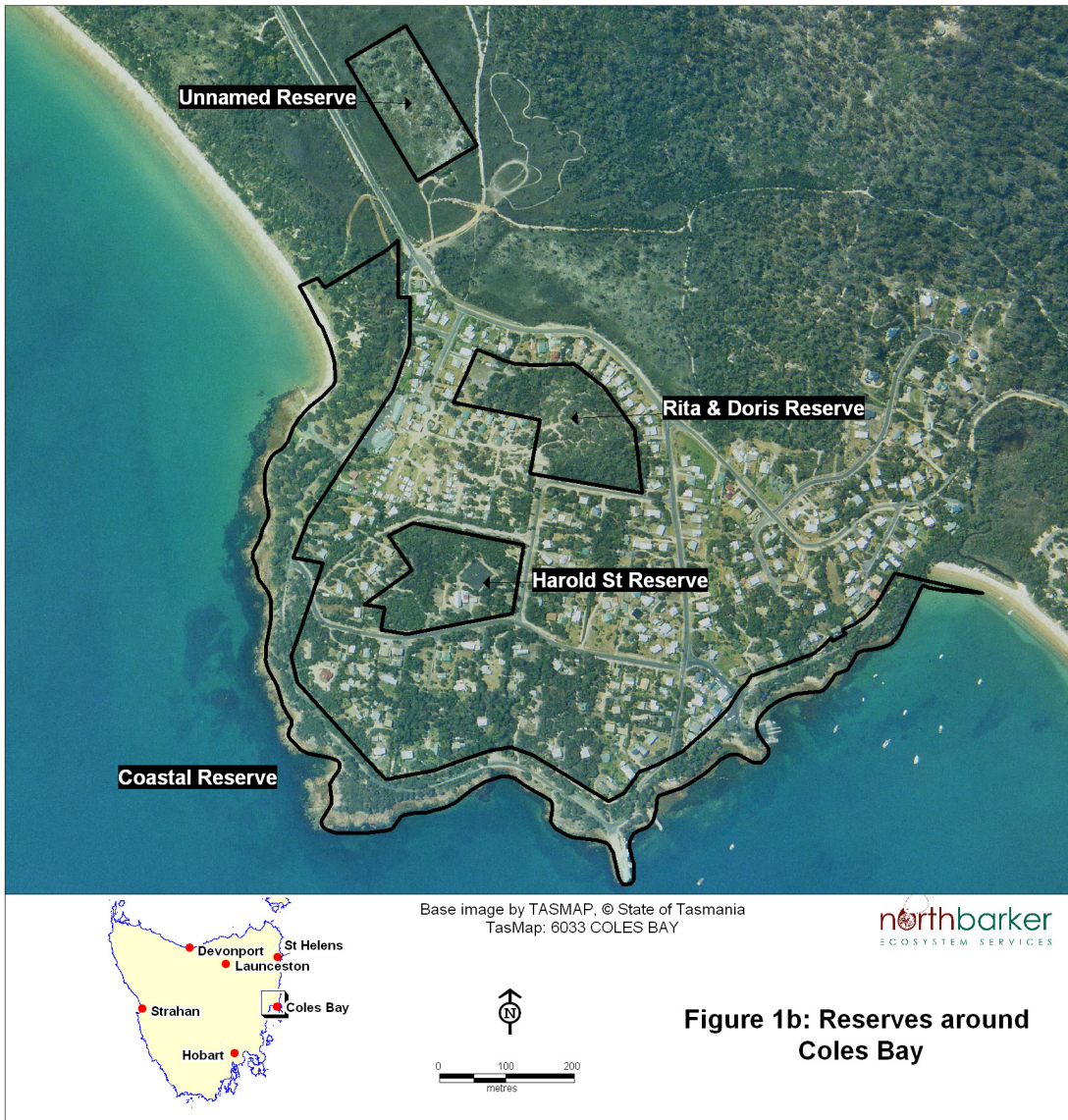


Figure 1b: Reserves around Coles Bay





## **2. SUMMARY OF BIOLOGICAL CHARACTERISTICS**

The following summarises the natural values (vegetation, flora and fauna habitat) and other biological characteristics (weeds and plant pathogens) of the Reserves. A detailed description of each Reserve is provided in section 3.

The information provided below is based on the results of a recent survey. The methods adopted for the survey and for assessment of conservation significance are provided in Appendix 1.

A list of vascular plants that occur within the Reserves is provided in Appendix 2. A review of the potential of the Reserves to support threatened species known to occur in the vicinity is provided in Appendices 3A and 3B.

The Council's legislative obligations in relation to the management of threatened species and communities as well as weeds occurring in the Reserves are provided in Appendix 4A. Other legislation and policies relevant to reserve management are provided in Appendix 4B.

### **2.1 VEGETATION**

The on-ground survey revealed a much greater variation in the vegetation compared with current TASVEG<sup>3</sup> mapping, which is very generalised. However, this is often the case with TASVEG due to issues of scale, aerial photo interpretation and lack of ground-truthing.

Across all the Reserves there are eleven TASVEG native vegetation communities present. These include five dry eucalypt forest communities, two non-eucalypt forest communities, three scrub and heathland communities and one grassland community. Five of these communities are listed as threatened under the *Nature Conservation Act 2002* (NCA).

The condition of communities varies although most are in good to excellent condition. Significant weeds infestations are limited in extent.

Five other TASVEG mapping units are also present. Three of these are classified by TASVEG as 'Other natural environments'. These are the rocky foreshore (Lichen lithosere – ORO), sections of sandy beaches (Sand, mud – OSM) and small bays along the foreshore (Water, sea – OAQ).

The two other mapping units are Marram grassland (FMG) and Urban areas (FUR). For the purposes of this study, FUR has been differentiated into 'FUR - parkland' and 'FUR - other' in order to distinguish the wide variation within this mapping unit. Areas of 'FUR – parkland' have significant stands of remnant native trees but they could not technically be classified as a native vegetation community as they are virtually devoid of any native understorey. In contrast areas of 'FUR – other' are either built environments, such as buildings, roads and jetties, or have no native vegetation, such as grassy road verges or private gardens encroaching onto Reserves.

Table 1 provides a list of all mapping units within the Reserves together with the conservation status of the native vegetation. The distribution of all mapping units across the Reserves, as mapped during the current survey, is depicted in Figures 2, 4, 5, 7 and 9 in section 3. Detailed descriptions of each native vegetation community within each reserve is also provided in section 3.

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<sup>3</sup> TASVEG is the abbreviation for the Tasmanian Vegetation Mapping Program (the vegetation map of the entire State)

**Table 1. Native vegetation communities and other TASVEG mapping units in the Reserves.**

TASVEG code	TASVEG community name	Listed under the Tasmanian Nature Conservation Act 2002	Present in Reserve (+)				
			Coastal Reserve	Unnamed Reserve	Rita & Doris Reserve	Harold Street Reserve	The Fisheries
<b>NATIVE VEGETATION</b>							
DOV	<i>Eucalyptus ovata</i> (black gum) forest & woodland	Yes	+				
DOW	<i>Eucalyptus ovata</i> (black gum) heathy forest & woodland	Yes	+				
DGL	<i>Eucalyptus globulus</i> (blue gum) dry forest & woodland	Yes	+				
DVC	<i>Eucalyptus viminalis</i> - <i>E. globulus</i> (white gum-blue gum) coastal forest & woodland	Yes	+				
DAC	<i>Eucalyptus amygdalina</i> (black peppermint) coastal forest & woodland			+	+		+
NCR	<i>Callitris rhomboidea</i> (oyster bay pine) forest	Yes				+	
NAV	<i>Allocasuarina verticillata</i> (drooping sheoak) forest		+				+
SAC	<i>Acacia longifolia</i> (coast wattle) coastal scrub		+				
SHW	Wet heathland			+			
SHG	Heathland on granite				+		
GHC	Coastal grass and herbfield		+				
<b>OTHER NATURAL ENVIRONMENTS</b>							
ORO	Lichen lithosere (rocks)		+				+
OSM	Sand, mud (beaches)		+				+
OAQ	Water, sea (small bays)		+				
<b>NON-NATIVE VEGETATION</b>							
FMG	Marram grassland		+				
FUR	Urban areas		+		+	+	+

## 2.2 FLORA OF CONSERVATION SIGNIFICANCE

A total of 222 vascular plant species were recorded during the survey including 7 threatened species and 55 introduced species. A full species list is given in Appendix 2.

Appendix 3A lists a total of 49 species of conservation significance previously recorded within the vicinity together with a description of their preferred habitat and an assessment of their likely occurrence within the Reserves.

In summary, apart from the 7 species recorded in the Reserves (see below for further details), there are only a few other species that are considered as having a moderate, moderate to high or very high potential to occur in the Reserves. This includes a few orchid species, which would require further targeted surveys during the appropriate flowering times to determine if they are present. The Unnamed Reserve has the greatest potential to support other threatened species.

### Threatened flora recorded in the Reserves

#### ***Brachyloma depressum* - spreading heath (TSPA: Rare)**

*B. depressum* occurs in eastern Tasmanian. It is a low shrub that grows to 1 m tall. It has slender and wiry branches with lance-shaped leaves that taper to a sharp point and white flowers. Flowering is from August to December.

It occurs in both the Rita & Doris and Harold St Reserves as locally scattered plants. Over 90 plants were observed across both Reserves (Plates 1 & 2; Figures 5 & 7).



Plate 1: *Brachyloma depressum*



Plate 2: *Brachyloma depressum*

#### ***Caustis pentandra* - thick twistsedge (TSPA: Rare)**

*C. pentandra* occurs mainly in the north-east and along the Freycinet peninsular. It is a scrambling sedge that reaches a height of 70 cm and often branches at the nodes, or stem joints.

It is very common in the Unnamed Reserve occurring in dense or scattered clumps throughout the DAC community. An estimated 100 plants are present (Plates 3 & 4; Figure 4).





Plate 3: *Caustis pentandra*



Plate 4: *Caustis pendandra*

***Conospermum hookeri* - tasmanian smokebush (TSPA & EPBCA:Vulnerable)**

*C. hookeri* is endemic to Tasmania and occurs along the east coast. It is an erect shrub that varies in height but can grow to over 2 m tall. It has long narrow leaves that are covered in silky hairs. It produces a mass of small white flowers at the stem tips between September and November.

At least seven plants occur in the Unnamed Reserve within the DAC community (Plates 5 & 6; Figure 4).



Plate 5: *Conospermum hookeri*



Plate 6: *Conospermum hookeri*

***Spyridium vexilliferum* var. *vexilliferum* - helicopter bush (TSPA: Rare)**

*S. vexilliferum* var. *vexilliferum* occurs in the eastern, northern and western Tasmania. It is a low slender, much-branched shrub up to 90 cm tall. The leaves are narrow with a hairless upper surface and the lower surface is covered with white or rust coloured hairs. The flowers have 1 to 3 distinctive white velvety bracts. Flowering is from September to January.

It is most abundant in the Rita & Doris Reserve where over 80 plants were observed. It is also present as small localised populations in the Coastal Reserve and the Harold St Reserve (Plates 7 & 8; Figures 2, 5 & 7).





Plate 7: *Spyridium vexilliferum* var. *vexilliferum*



Plate 8: *Spyridium vexilliferum* var. *vexilliferum*

***Thryptomene micrantha* - ribbed heathmyrtle (TSPA: Vulnerable)**

*T. micrantha* occurs on the east coast and in the midlands. It is a hairless shrub with slender spreading branches which grows up to 1.2 m tall. The leaves are wedge-shaped with a blunt tip. Small white flowers are borne along the stems. Flowering occurs from late winter to spring.

It is abundant at The Fisheries in the DAC community where it has colonised previously cleared areas both under the power cables parallel to the road and at the top of a steep rise above the beach. Over 800 plants were observed (Plates 9 & 10; Figure 9).



Plate 9: *Thryptomene micrantha*



Plate 10: *Thryptomene micrantha*

***Zieria littoralis* - downy zieria (TSPA: Rare)**

*Z. littoralis* is confined to the central east coast. It is an erect shrub growing up to 2 m tall. It has greyish-green leaves that are covered with short, velvety hairs. The small white or pink flowers are produced in spring.

It occurs in the Rita & Doris Reserve in the SHG community. Over 80 plants were observed growing in cracks in granite outcrops (Plates 11 & 12; Figure 5).





Plate 11: *Zieria littoralis*



Plate 12: *Zieria littoralis*

***Xanthorrhoea arenaria* - sand grasstree (TSPA & EPBCA: Vulnerable)**

*X. arenaria* is endemic to Tasmania where it occurs in northern and eastern coastal areas from Bridport to Coles Bay. This grass tree does not have an above ground trunk. The sometimes greyish or bluish-green leaves are up to 80 cm long. The flower spike is between one-third and one-half the length of the scape, or stem.

It occurs at the Unnamed Reserve. Grasstrees are often difficult to identify especially when they are not in flower and there are also some recognised taxonomic difficulties with this genus. Several grasstrees, some in flower, were observed both within the SHW and DAC communities in this reserve. Many of these are certainly the more common southern grasstrees (*X. australis*) but only one plant was identified as the threatened sand grasstree. There are possibly more within this Reserve.



Plate 13: *Xanthorrhoea arenaria*

## 2.3 FAUNA HABITAT

The diverse nature of the vegetation across all the Reserve equates to a diverse range of habitat opportunities for native fauna, including mammals, birds, reptiles and a variety of invertebrates.

Three of the Reserves, the Coastal and Unnamed Reserves and The Fisheries are all contiguous with extensive areas of relatively undisturbed habitat in the Coles Bay area, including the Freycinet National Park. The Rita & Doris and Harold St Reserves provide a refuge of high quality habitat within the urban area, although neither is far removed from the more extensive habitat in the area.

## 2.4 FAUNA OF CONSERVATION SIGNIFICANCE

Appendix 3B lists threatened fauna species that have been recorded within the vicinity of the Reserves or that are considered to have the potential to occur. A brief discussion is given to indicate the reasons why habitat is suitable or unsuitable.

In summary, habitat present in the Reserves does not provide core breeding habitat for any threatened fauna with the possible exception of the new holland mouse. However, foraging habitat is present in the Reserves, or in the immediate vicinity, for the Tasmanian devil, spotted-tailed quoll, white-bellied sea-eagle and swift parrot.

### **New holland mouse (*Pseudomys novaehollandiae*) (TSPA: Endangered)**

The New Holland Mouse was thought to be extinct until re-discovered in the 1960s. Recent surveys have confirmed its occurrence at various localities, all within 15 km of the coast and below an altitude of 200m, including along the east coast of Tasmania. Here its habitat preference is coastal dry heath on a sandy substrate with a dense and floristically diverse understorey although it has been found in a variety of habitats including woodland with an open understorey, *Allocasuarina* woodland and *Juncus* hardpan. It has a strong association with certain heath plant species (e.g. *Xanthorrhoea australis*, *Hypolaena fastigiata*, *Aotus ericoides* and *Lepidosperma concavum*).

It shelters and nests in 10 cm wide, deep burrows which it excavates in sandy soil, and occasionally builds temporary twig nests at the base of tussocks or grass trees.

It is considered to be dependent on disturbance of its habitat by fire to maintain high population densities. Densities are highest in vegetation burnt within 5 to 10 years where seed producing legumes and epacrids are actively regenerating. Long unburnt habitat results in the decline of mouse numbers and potentially local loss of populations. Clearance of coastal heaths is the main threatening process. However, it may also be threatened by the impact of *Phytophthora cinnamomi* on the heathlands. *P. cinnamomi* can kill plant species that provide seeds for food and cover for protection.

The Unnamed Reserve has many characteristics that accord with core habitat for the new-holland mouse. The DAC community is open woodland with a heathy understorey that provides the habitat structure as well as the plant species associated with the mouse. Additionally, the Reserve does not appear to be currently infected by *P. cinnamomi*. The only unknown factor is the fire history. It does not appear to have been burnt recently although it does appear to have regenerated following at least some clearing in the recent past.

## 2.5 SIGNIFICANT TREES

In addition to the many trees within the native vegetation communities and within areas mapped as 'FUR – parkland', there are a number of significant native trees along the roadsides in the Coastal Reserve. They include large mature Tasmanian blue gums (*Eucalyptus globulus*) and mature and old-growth white gums (*E. viminalis*) (Figure 2).

Apart for the aesthetic, visual and cultural value of these trees, they provide valuable foraging and nesting habitat for a range of native birds, including threatened species. They may be utilised as perching sites by the threatened white-bellied sea-eagle and the blue gums provide potential foraging habitat for the threatened swift parrot.

## 2.6 WEEDS

Fifty-five introduced species were recorded during the survey. Three of these are 'declared weeds' under the *Weed Management Act 1999* and they are also all Weeds of National Significance. Another 30 species are considered to be significant environmental weeds. All of these species are listed in Tables 2A and 2B, a photograph of each is provided in Appendices 5A and 5B, and their distribution is depicted in Figures 3, 6, 8 and 10.

It is evident from Tables 2A and 2B that the Coastal Reserve contains the most weed species and the most widespread weed is sweet pittosporum, which was observed at 43 general locations.

It should be noted that the number of observations provided in Tables 2A and 2B are intended to give a general indication of relative abundance and does not always reflect actual abundance. For example, there is likely to be more than 43 sweet pittosporum plants but it would have been impractical to map each one.

**Table 2A. Declared and WONS\* weeds recorded in the Reserves.**

\* 'Declared weeds' under the *Weed Management Act 1999*. WONS = Weed of National Significance.  
\*\* Observations = the number of general locations across the Reserves where it was observed.

Common name	Scientific name	Observations**	Occurrence
Blackberry	<i>Rubus fruticosus</i>	1	Coastal Reserve
Bridal creeper	<i>Asparagus asparagoides</i>	1	Coastal Reserve
Montpellier broom	<i>Genista monspessulana</i>	1	Coastal Reserve

**Table 2A. Other environmental weeds recorded in the Reserves.**

\* Observations = the number of general locations across the Reserves where it was observed.

Common name	Scientific name	Observations*	Occurrence
Agapanthus	<i>Agapanthus praecox</i> subsp. <i>orientalis</i>	1	Coastal Reserve
Banana passionfruit	<i>Passiflora tarminiana</i>	1	Coastal Reserve
Bears breeches	<i>Acanthus mollis</i>	1	Coastal Reserve
Blackberry nightshade	<i>Solanum nigrum</i>	2	Coastal Reserve Harold St Reserve
Blue butterfly bush	<i>Psoralea pinnata</i>	3	Coastal Reserve
Blue marguerite	<i>Felicia amelloides</i>	4	Coastal Reserve
Blue periwinkle	<i>Vinca major</i>	1	Coastal Reserve
Bluebell creeper	<i>Billardiera fusiformis</i>	3	Harold St Reserve The Fisheries
Cape ivy	<i>Delairea odorata</i>	2	Coastal Reserve



Common name	Scientific name	Observations *	Occurrence
Cootamundra wattle	<i>Acacia baileyana</i>	1	Coastal Reserve
Dolichos pea	<i>Dipogon lignosus</i>	3	Coastal Reserve
Grevillea hybrid	<i>Grevillea</i> sp.	2	Coastal Reserve Harold St Reserve
Gum (planted)	<i>Eucalyptus</i> sp.	1	Rita & Doris Reserve
Howitts wattle	<i>Acacia howittii</i>	4	Rita & Doris Reserve Harold St Reserve The Fisheries
Ivy	<i>Hedera helix</i>	3	Coastal Reserve
Japanese honeysuckle	<i>Lonicera japonica</i>	1	Coastal Reserve
Lignum	<i>Muehlenbeckia complexa</i>	1	Coastal Reserve
Lions ear	<i>Leonotis leonurus</i>	1	Coastal Reserve
Madeira broom	<i>Genista stenopetala</i>	1	Harold St Reserve
Milkwort	<i>Polygala myrtifolia</i>	3	Rita & Doris Reserve
Mirrorbush	<i>Coprosma repens</i>	14	Coastal Reserve Harold St Reserve
Montbretia	<i>Crocsmia Xcrocsmiiflora</i>	1	Coastal Reserve
Nasturtium	<i>Tropaeolum major</i>	4	Coastal Reserve Harold St Reserve
Pincushion plant	<i>Hakea laurina</i>	1	The Fisheries
Red valerian	<i>Centranthus ruber</i>	1	Coastal Reserve
Sea spurge	<i>Euphorbia paralias</i>	1	Coastal Reserve
Shade crassula	<i>Crassula multicava</i>	3	Coastal Reserve The Fisheries
Sweet pittosporum	<i>Pittosporum undulatum</i>	43	Coastal Reserve Rita & Doris Reserve Harold St Reserve
Trailing daisy	<i>Osteospermum fruticosum</i>	8	Coastal Reserve Rita & Doris Reserve Harold St Reserve The Fisheries
Tree lucerne	<i>Chamaecytisus palmensis</i>	1	Coastal Reserve

## **2.7 PHYTOPHTHORA CINNAMOMI**

Commonly known as dieback or root rot fungus, *P. cinnamomi* is a soil borne fungal pathogen that invades the roots of plants and starves them of nutrients and water. Heath communities are the most susceptible to infection with a consequent serious loss of species diversity. It is generally spread by the transportation of soil on vehicles, construction machinery and walking boots. The establishment and spread of *P.*

*cinnamomi* is favoured in areas that receive above 600 mm of rainfall per annum, are below 800 m altitude and have a predominantly heathy shrub layer.

Coles Bay is situated within the favoured climatic zone of *P. cinnamomi* and there are known infestations in the area. Communities within the Reserves that are highly susceptible to *P. cinnamomi* are DAC (present in the Unnamed and Rita & Doris Reserves and The Fisheries), SHW (present in the Unnamed Reserve) and SHG (present in the Rita & Doris Reserve). Communities of variable or moderate susceptibility are DOW and DVC (both present at the northern end of the Coastal Reserve).

Whilst detection of *P. cinnamomi* in the field is sometimes difficult, no obvious signs of its current presence were observed in any of the Reserves during the survey. Furthermore, all of the susceptible communities in each reserve supported at least three *P. cinnamomi* susceptible plant species that are recognised as reliable indicator species.

### 3. DETAILED DESCRIPTIONS OF THE RESERVES

#### 3.1 COASTAL RESERVE

- *Physical description and infrastructure*

The Coastal Reserve is the narrow coastal fringe that runs around the perimeter of the town. It is approximately 1.8 km long and varies in width from approximately 60 m to 140 m. It occupies approximately 12 hectares.

The northern end adjoins the coastal vegetation fringing Muirs Beach and extends across the dune to the western edge of Coles Bay Road. The eastern end adjoins Freycinet National Park at Richardsons Beach. Along the length of the reserve the landward boundary adjoins private properties. The seaward boundary appears to be at the high water mark. This boundary for much of its length is rocky foreshore although a section of Muirs Beach is also included as is a small sandy beach near the boat ramp at the eastern end (Figures 1 and 2).

The Esplanade, a public road, runs through the reserve for much of its length. It is intersected by Harold Street and the access roads to the two boat ramps and the jetty as well as some private property access roads.

Near Muirs Beach the reserve incorporates parkland, including barbeques, picnic tables and public toilets. Facilities near the eastern boat ramp include a turning circle for boat launching, parking, public toilets and a boatshed used by local boat hire businesses.

Sections of informal walking tracks are present through bushland in some parts of the reserve.

Electricity supply poles and cables run parallel to the Esplanade on its landward side.

- *Biological description*

Eight native vegetation communities occur in the reserve. NAV is the most extensive community, DOV, DOW, DVC, SAC and FMG occur only in the most northern section, GHC occurs as two small patches along the rocky foreshore and DGL occurs in the eastern section. Two areas of FUR with remnant native trees occur in the northern section. DOV, DOW, DVC and DGL are listed as threatened communities. One species of threatened flora is present as well as a number of significant weeds including three 'declared weeds'.

Vegetation, threatened flora and significant trees are depicted in Figure 2; significant weeds in Figure 3.

*Allocasuarina verticillata* forest (NAV) – This community occurs on both sides of the Esplanade. Drooping sheoak is the dominant tree although the very occasional eucalypts are present including black gum, white gum and black peppermint. The understorey varies considerably from a ground layer of dense leaf litter with a sparse cover of native grasses, herbs and prostrate shrubs to areas of dense herbaceous climbers. Other lifeforms in varying density include understorey trees, low and tall shrubs and graminoids.

One threatened plant species, helicopter bush (*Spyridium vexilliferum* var. *vexilliferum*), occurs at one location above a steep cutting near the jetty.

This community is generally in good to very good condition. Although weed species are common they are rarely dominant. Some small patches of highly disturbed ground have been colonised by introduced grasses. Elsewhere the most common woody weeds are sweet pittosporum and mirrorbush but these occur as scattered juvenile plants.

*Eucalyptus ovata* forest (DOV) – This community forms a continuum with the DOW community along a small creek behind the dune system. DOV occurs as a very narrow strip. Black gum and to a lesser extent white gum dominate the tree layer forming a dense canopy. The understorey includes some native shrubs, herbs, and ferns but it is dominated by weed species, notably climbers.

*E. ovata* heathy forest (DOW) – As DOV grades into DOW the canopy of black gums is more open and the understorey is dominated by heathy native shrubs. This community is in excellent condition.

*E. viminalis*-*E. globulus* coastal forest (DVC) – This occurs on the steep and relatively tall rear dune adjacent and parallel to the DOV and DOW communities. White gums dominate and occasional understorey trees include silver banksia, native cherry and drooping sheoak. There are no blue gums present. The understorey is diverse in species and life forms which includes tall shrubs, low shrubs, grasses, sedges, ferns, climbers and herbs.

This community is in excellent condition and it is virtually weed-free. The only weed of any significance that was observed is one mature fruiting sweet pittosporum plant.

*Acacia longifolia* coastal scrub (SAC) – This occurs on the seaward face of the dune, parallel to the DVC community. Species diversity in this community is typically low. Coast wattle and to a lesser extent coast beardheath form a sparse to dense canopy over a ground layer of native sedges, grasses, climbers, ferns and herbs. Patches of bare sand are common although sand blow-outs do not appear to be occurring. A substantial blow-out visible on old aerial photos appears to have been recolonised to a large extent.

The only weed in any great abundance is marram grass which probably contributes significantly to stabilising the vegetation.

Marram grassland (FMG) – This non-native vegetation community occurs as a narrow strip between Muirs Beach and the SAC community. Whilst marram grass is an introduced plant, other species present are mainly natives and include grasses, climbers, herbs, ferns and occasional shrubs.

Coastal grass and herbfield (GHC) – Two small patches of GHC occur below the NAV community in depressions along the rocky foreshore. The dominant grasses present are coast speargrass and australian saltgrass. Other species present in significant abundance are more characteristic of saltmarsh communities. These include creeping brookweed and beaded glasswort which are more typical of Succulent saline herbland (ASS) and sea rush which is typical of Saline sedgeland/rushland (ARS). However, these areas have been classified as GHC as the substrate and the presence of coast speargrass are not characteristic of saltmarsh communities.

The condition of the community is very good. The only significant weed found was one sea spurge plant which was pulled out at the time of the survey.

*E. globulus* dry forest (DGL) – This community dominates the eastern section of the reserve. It occurs in two large patches, east and west of the boat ramp. The dominant trees are blue gum and white gum with occasional black peppermint. A diverse layer of understorey trees and tall shrubs form a dense canopy over grasses, sedges and saggs and to a lesser extent low shrubs, climbers and herbs.

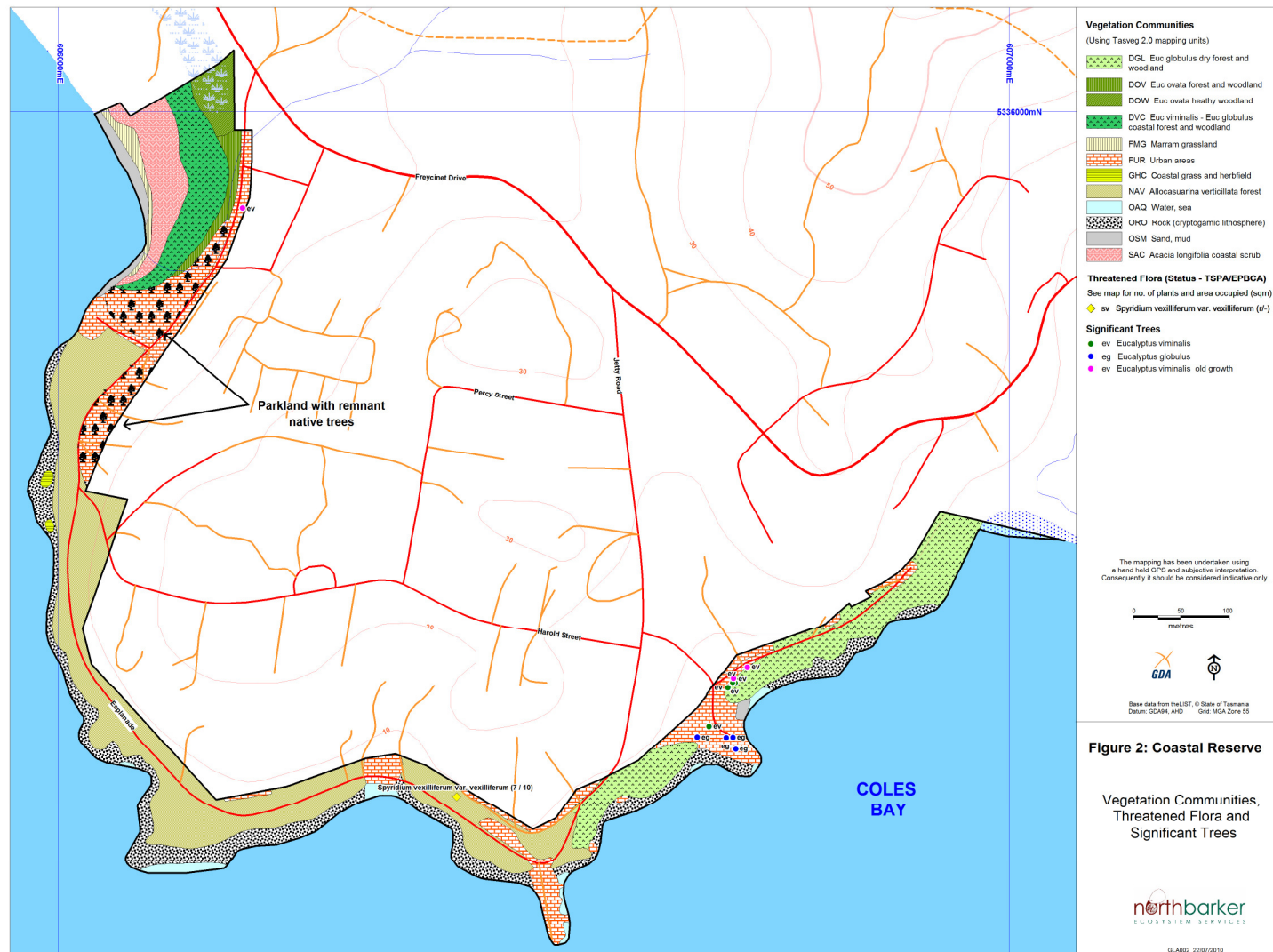
The condition of the community varies from very good to poor. Some disturbed patches, where informal tracks have been cut down to the water or where unfenced gardens are continuous with the reserve, have been colonised by introduced grasses. Occasional garden escapes include shade crassula and trailing daisy.

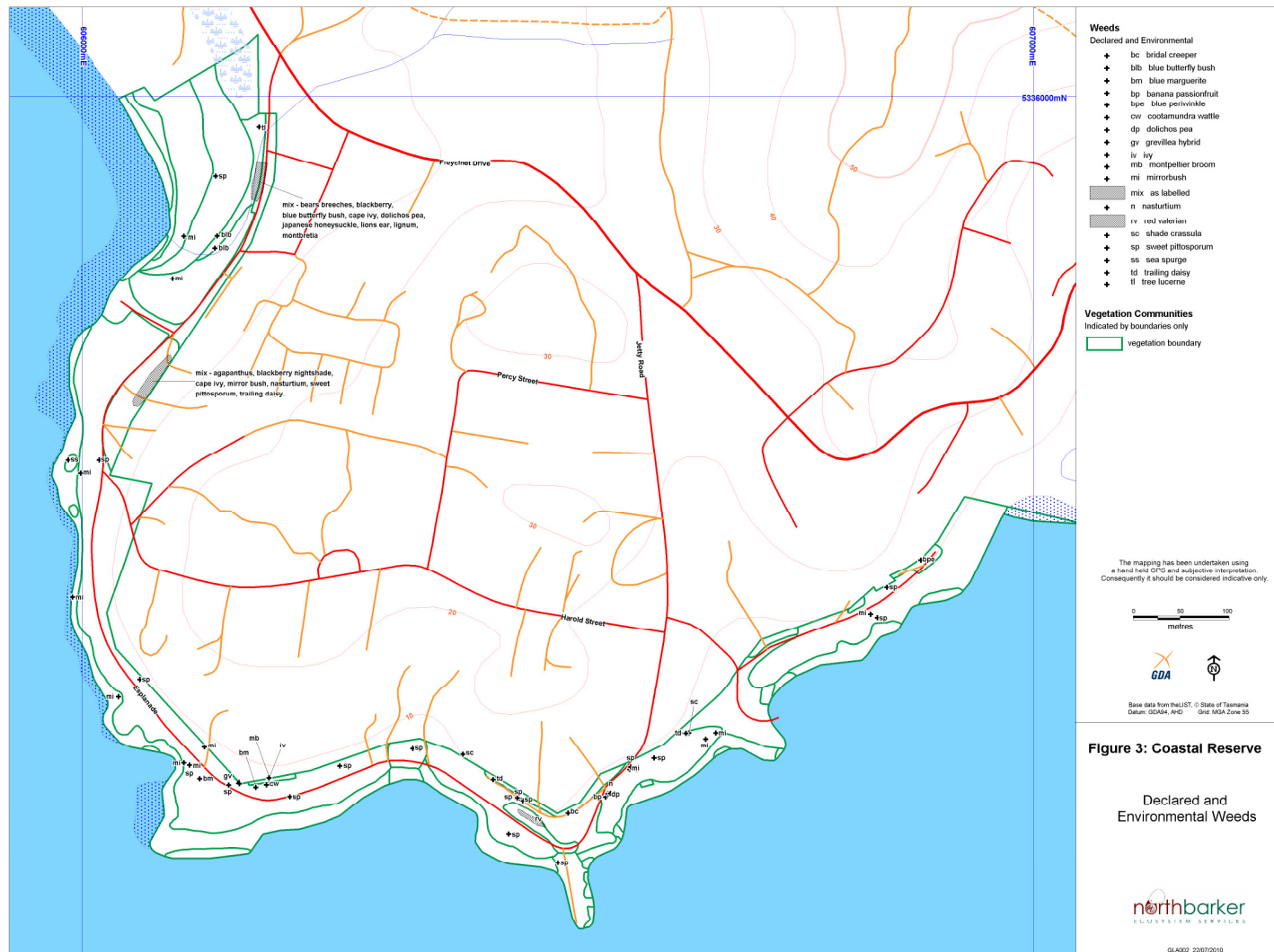
Urban areas (FUR) with remnant native trees – Two areas of this mapping unit are present in the northern section of the reserve. The ground is dominated by introduced grasses which are probably regularly mown.

The area west of the Esplanade near the access to Muirs Beach supports a significant number of large mature black and white gums.

The second area, on the eastern side of the Esplanade, supports black gum, drooping sheoak and blackwood trees. In this area there is also a ditch which has been colonised by a number of environmental weeds although some native species are also present.

Significant trees – Some large eucalypts are present on road verges within the reserve. One old-growth white gum occurs on the road verge opposite the DOV community in the northern section. Several blue and white gums, including large mature and old-growth trees, occur near the boat ramp in the eastern section of the reserve.





### 3.2 UNNAMED RESERVE

- *Physical description and infrastructure*

The Unnamed Reserve is located to the north of the town and to the east of Coles Bay Road. It is entirely covered by native vegetation which is contiguous with the surrounding vegetation although it does have perimeter wire fence.

It covers an area of 2 hectares which is 200 m long by 100 m wide. The land is more or less flat but slightly sloping down towards the south west corner. Apart from the fence there is no infrastructure and no tracks present.

According to anecdotal information this area was once proposed as a town oval and has also been used for grazing horses. An assessment of old aerial photos suggests that it was cleared of vegetation at some stage in the recent past but since then the native vegetation has regenerated well.

- *Biological description*

Two native vegetation communities occur in the reserve. DAC is the most extensive community and a smaller area of SHW occurs in the south western corner. Three species of threatened flora are also present.

Vegetation and threatened flora are depicted in Figure 4.

*Eucalyptus amygdalina* coastal forest (DAC) – This community currently occurs as a low open woodland formation. Black peppermint is the dominant tree and other occasional low trees present include black gum, black sheoak, common native-cherry and sydney coast wattle. The understorey is diverse in species and lifeforms, including tall, low and prostrate shrubs, sedges, rushes, lilies, orchids and occasional herbs and ferns.

At least two species of threatened plant occur in this community. Thick twistsedge (*Caustis pentandra*) forms dense clumps and Tasmanian smokebush (*Conospermum hookeri*) occurs as scattered plants (Figure 2).

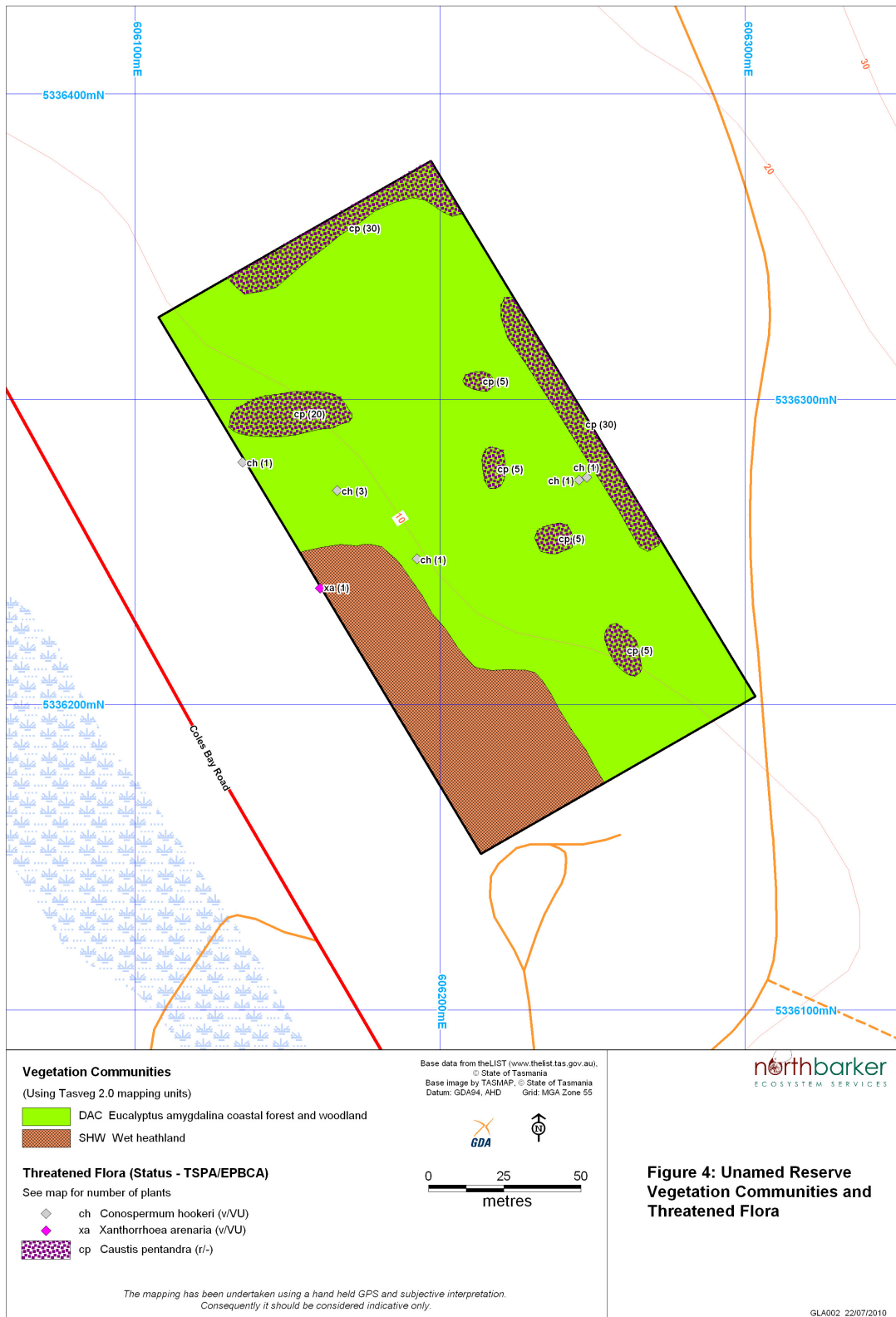
The community is in excellent condition and apart from sydney coast wattle no introduced plants were recorded.

Wet heathland (SHW) – This community occurs in the wetter south western corner of the reserve. The tallest stratum is dominated by common teatree and the ground layer by low shrubs, sedges and lilies. Black gum is an occasional low emergent tree.

One threatened species, sand grasstree (*Xanthorrhoea arenaria*), occurs in this community. Only one plant was identified although more individuals may be present.

The condition of the community is excellent and there are no weeds of any significance. Some occasional introduced herbs as well as sydney coast wattle are present at the southern end. Here there are also small patches of bare ground which is possibly compacted ground and which may be impeding regeneration.





### 3.3 RITA & DORIS RESERVE

- *Physical description and infrastructure*

The Rita & Doris Reserve is located at the highest point within the town and covers an area of approximately 3 hectares. It is compact but irregular in shape.

It is bounded to the west, north and east by private property and to the south by Percy Street. The private property boundaries are defined by fencing and the Percy Street side is unfenced.

At the main entry to the reserve, at the western end of Percy Street, there is a council depot shed within a small cleared area. Here there is also a narrow gravel, circular track providing vehicular access to picnic tables approximately 30 m from the cleared area. This picnic area does not appear to be a high usage area. Beyond the picnic area there is a wooden lookout tower which provides views in the direction of Muirs Beach. There are also walking tracks within the reserve. A track along the northern and north eastern edge is largely cleared of vegetation, presumably as a fire break.

- *Biological description*

Two native vegetation communities occur in the reserve. DAC is the most extensive and a smaller area of SHG occurs in the central part of the reserve. Three species of threatened flora and a number of significant weeds are also present.

Vegetation and threatened flora are depicted in Figure 5; significant weeds in Figure 6.

*Eucalyptus amygdalina* coastal forest (DAC) – This community is in a mature growth phase. Black peppermint and white gum are the dominant trees. In some sections the understorey trees, most commonly black sheoak, create a dense canopy. Elsewhere the canopy is more open and the understorey and ground layers are dominated by a rich diversity of shrubs as well as sedges and other graminoids. Herbs are a lesser component of the flora although several species of orchids were recorded.

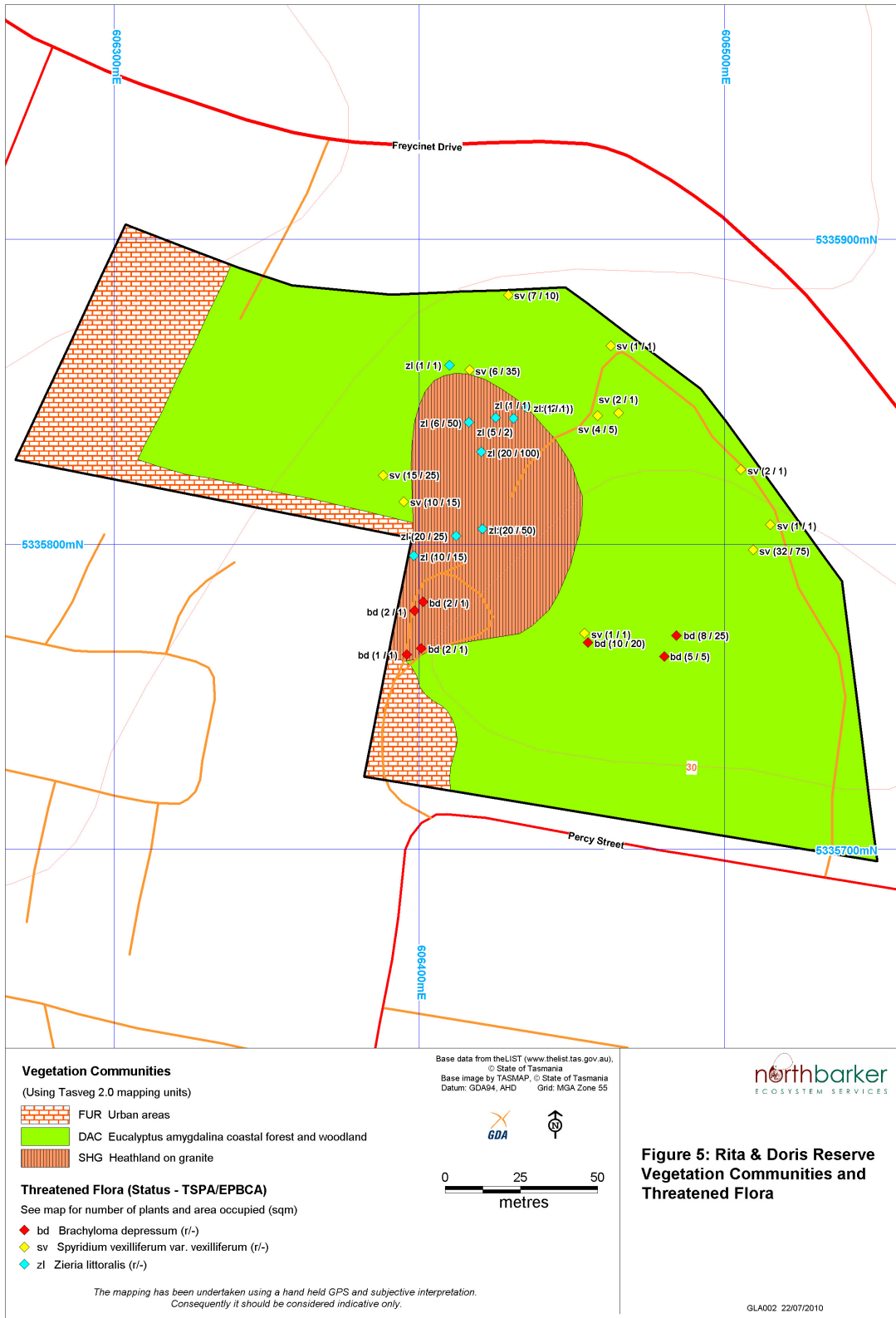
The community supports substantial populations of two threatened shrubs, spreading heath (*Brachyloma depressum*) and helicopter bush (*Spyridium vexilliferum* var. *vexilliferum*) (Figure 2).

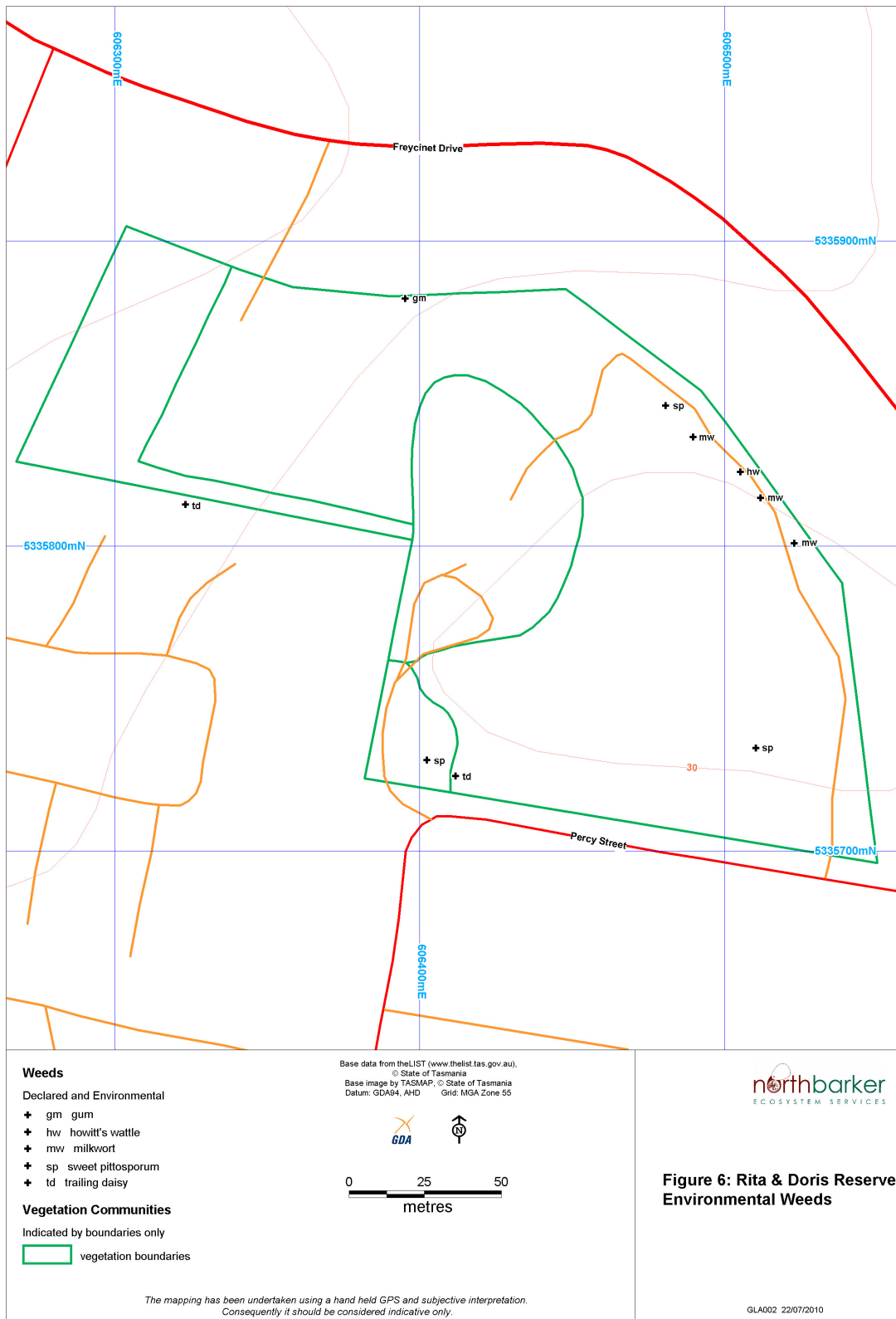
Overall the condition of the community is excellent. Although a number of significant weeds are present these are mostly confined to the edge of the community, notably along the fire break on the northern side of the reserve. A non-Tasmanian eucalypt species has also been planted along this firebreak, possibly by the adjacent land owner.

Heathland on granite (SHG) – This community is largely confined to an area of granite outcrop dominated by white kunzea and, to a lesser extent, downy zieria. The ecotone between SHG and DAC, in the shallow soils around the perimeter of the rocks, supports black sheoak, oyster bay pine, sedges and a sparsely distributed but relatively diverse number shrubs as well as a few herbs including orchids.

It supports three threatened shrubs. Downy zieria (*Zieria littoralis*) is present in significant numbers together with extensions of the populations of spreading heath and helicopter bush occurring in DAC.

The condition of the community is excellent and no weeds were recorded.





### 3.4 HAROLD ST RESERVE

- *Physical description and infrastructure*

The Harold Street Reserve is located within the town to the south west of, and downslope from, the Rita & Doris Reserve. Similarly to the Rita & Doris Reserve, it is approximately 2.5 hectares in area and of a compact but irregular shape.

It is bounded to the east and south by bitumen roads, Cosgrove and Harold Streets respectively, and to the north by a poorly-formed gravel road, Brooker Street. The western side of the reserve adjoins unfenced private properties.

A substantial portion of the reserve is cleared of vegetation. This area contains a community hall, public toilets and tennis courts, a parking area as well as the ambulance and fire station buildings.

The south eastern corner of the reserve, classified here as Urban area (FUR) with remnant native trees, contains a children's playground, barbeque and picnic tables.

Some recent tree clearing has been undertaken around the hall, toilets and the fire and ambulance stations. This was part of a plan to provide some protection for this infrastructure from fire<sup>4</sup>.

A few informal walking tracks are present through the native vegetation.

Some items of old furniture have been dumped in the reserve. There is also some evidence of garden waste dumping, which may have resulted in minor weed infestation of nasturtium.

- *Biological description*

One native vegetation community, NCR, as well as FUR with remnant native trees occur in the reserve. NCR is listed as a threatened community. Two species of threatened flora and a number of significant weeds are also present.

Vegetation and threatened flora are depicted in Figure 7; significant weeds in Figure 8.

*Callitris rhomboidea* forest (NCR) – This community occupies the north western sector of the reserve. Oyster bay pine, black sheoak and to a lesser extent tall white kunzea shrubs, as well as emergent black peppermint and white gum, create a dense canopy across much of this community. Given the presence of mature, senescent and dead eucalypts, this area probably once supported eucalypt forest but the nature of the canopy appears to be suppressing any eucalypt regeneration. A major fire may result in a reversion to eucalypt forest.

The understorey is generally sparse although patches of sedges are common. Areas where the canopy is less dense, notably around the periphery and along tracks, other native shrubs and herbs are common.

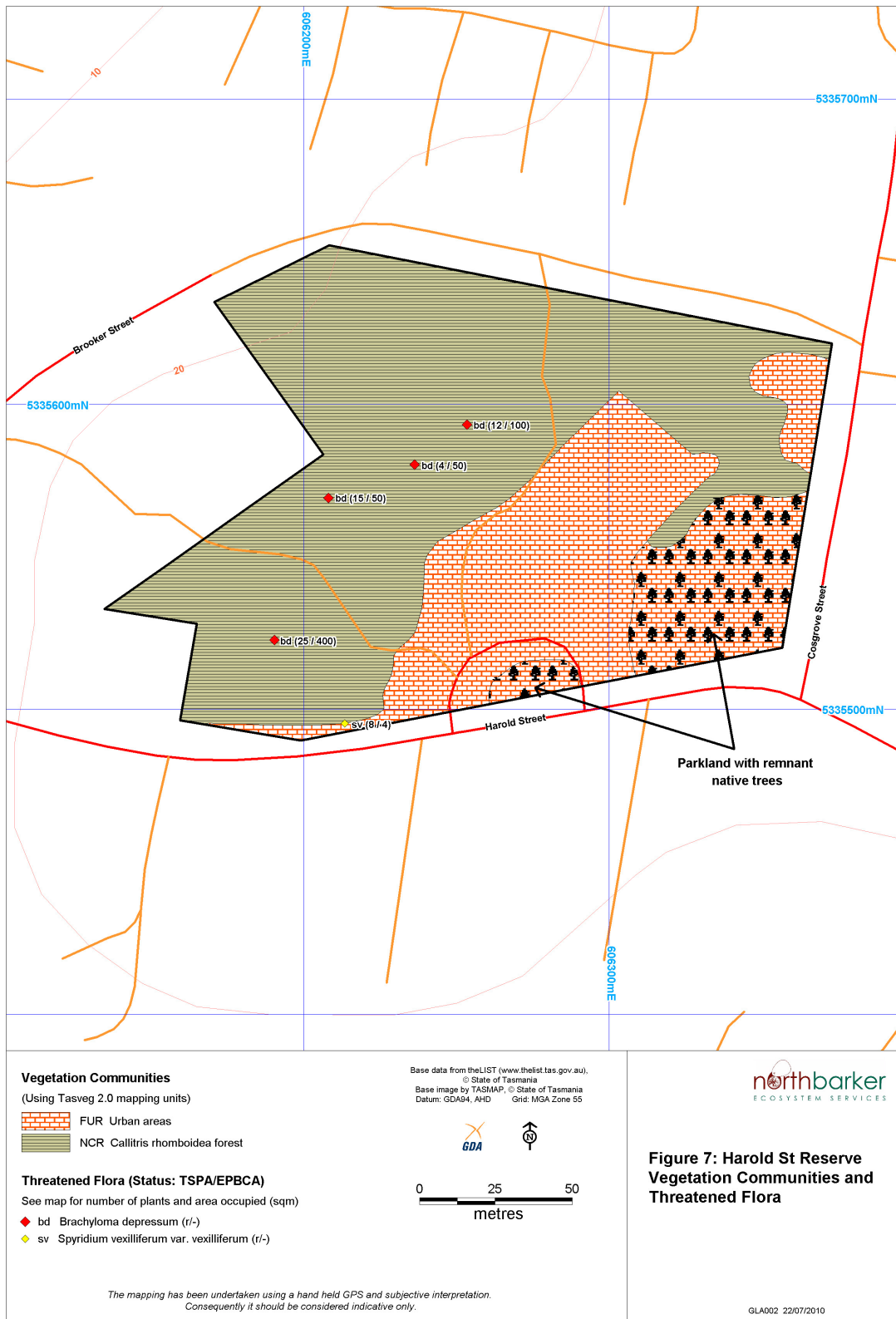
Two threatened shrubs are present in the community, spreading heath (*Brachyloma depressum*) and helicopter bush (*Spyridium vexilliferum* var. *vexilliferum*).

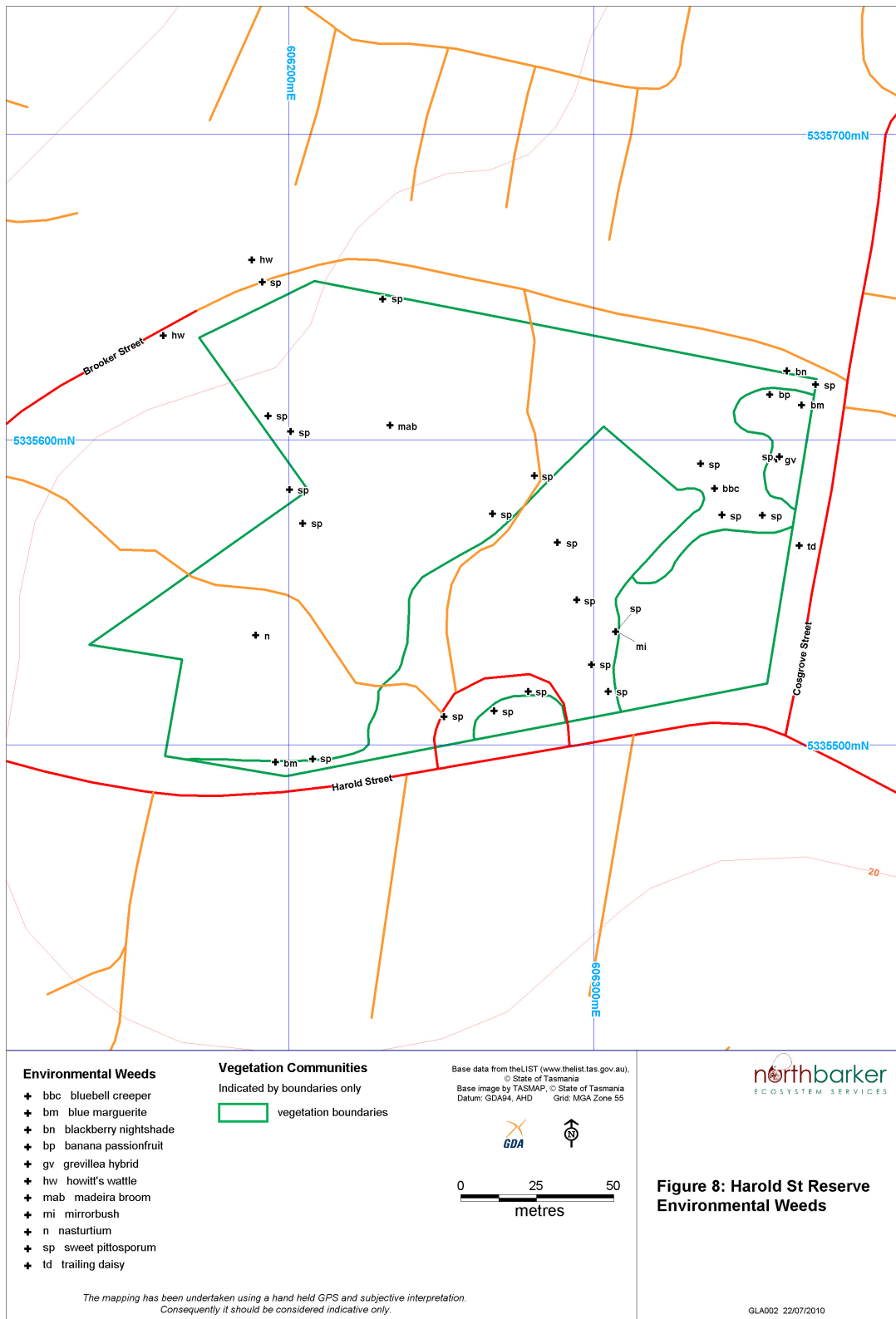
The community is in excellent condition and significant weeds are mostly confined to the periphery of reserve.

Urban areas (FUR) with remnant native trees – This is the south eastern corner where the children's playground is located. Substantial stands of oyster bay pine and black sheoak with a few large mature black peppermints and white gums are present. A few native low shrubs, herbs and sedges also persist but the ground is largely devoid of vegetation.

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<sup>4</sup> North Barker Ecosystem Services 2009





### 3.5 THE FISHERIES

- *Physical description and infrastructure*

The general area known as The Fisheries is situated on the edge of Great Oyster Bay approximately 2 km directly south of Coles Bay. It incorporates a parcel of land that has been subdivided into many private lots on which houses have been constructed. In total the subdivision is 400 m long and between 140 m to 300 m wide. Access to it is through Freycinet National Park which surrounds it on its three landward sides. Curiously, part of the bay and beach, which it adjoins, is also part of the National Park.

The Council managed area incorporates a strip of land, or road verge, that adjoins the southern side of the access road which runs through the lots and terminates at the beach. It also incorporates part of the foreshore and the adjacent coastal vegetation. It occupies a total of 1.2 ha.

The road verge section is approximately 300 m long by 15 m wide. It supports native vegetation but there are also electricity supply poles and cables running along its length. A line of trees and tall shrubs have been cleared under the cables. Access drives to private properties also cross over the verge. The road itself crosses into the verge near the beach end.

The foreshore section of the reserve incorporates the western half of a sandy beach, the rocky foreshore that adjoins the beach and the adjacent vegetation. A small creek flows into the bay across the beach. A boat shed is located on the beach close to where it adjoins the rocky foreshore. This coastal section of the reserve is approximately 270 m long and between 3 m to 50 m wide.

- *Biological description*

Two native vegetation communities, DAC and NAV, occur in the reserve. One species of threatened flora and a small number of significant weeds are also present.

Vegetation and threatened flora are depicted in Figure 9; significant weeds in Figure 10.

*Eucalyptus amygdalina* coastal forest (DAC) – This community occurs along the road verge and also behind the beach. Along the road verge black gum is the dominant tree and understorey trees and tall shrubs are black sheoak, oyster bay pine, smoky teatree and white kunzea. The low shrub ribbed heathmyrtle has colonised the disturbed strip below the power cables. Sedges are also common in the lower stratum.

The section behind the beach extends from near the edge of the creek to the top of a steep slope that rises up from the beach. White gum is a co-dominant tree and the understorey varies with landscape position. Dominant lifeforms include trees, shrubs, sedges and other graminoids. Ribbed heathmyrtle has also colonised a disturbed area at the top of the steep slope.

Ribbed heathmyrtle (*Thryptomene micrantha*) is a threatened species and occurs in substantial numbers in the reserve.

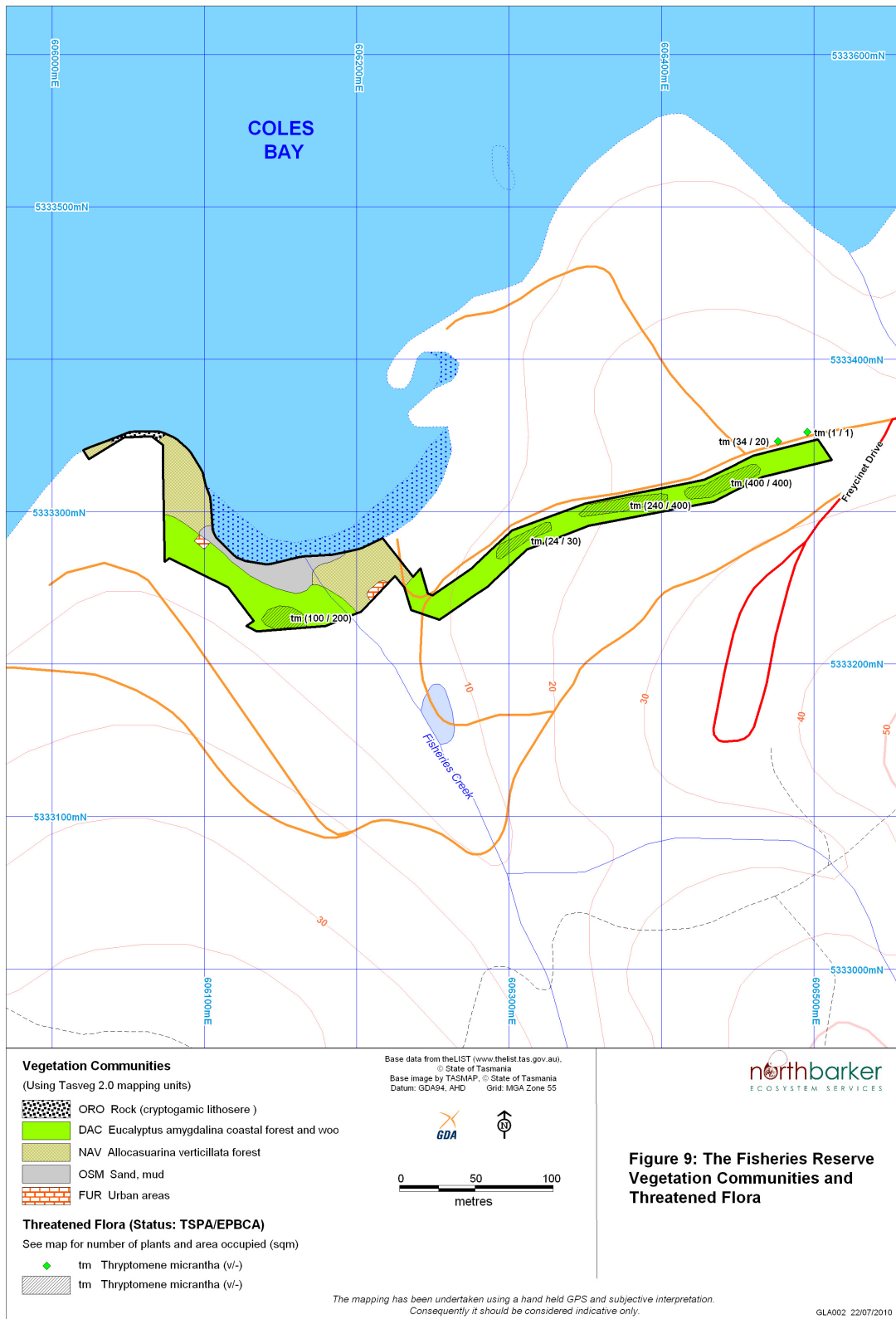
The condition of this community is excellent and the few significant weeds present are very limited in extent.

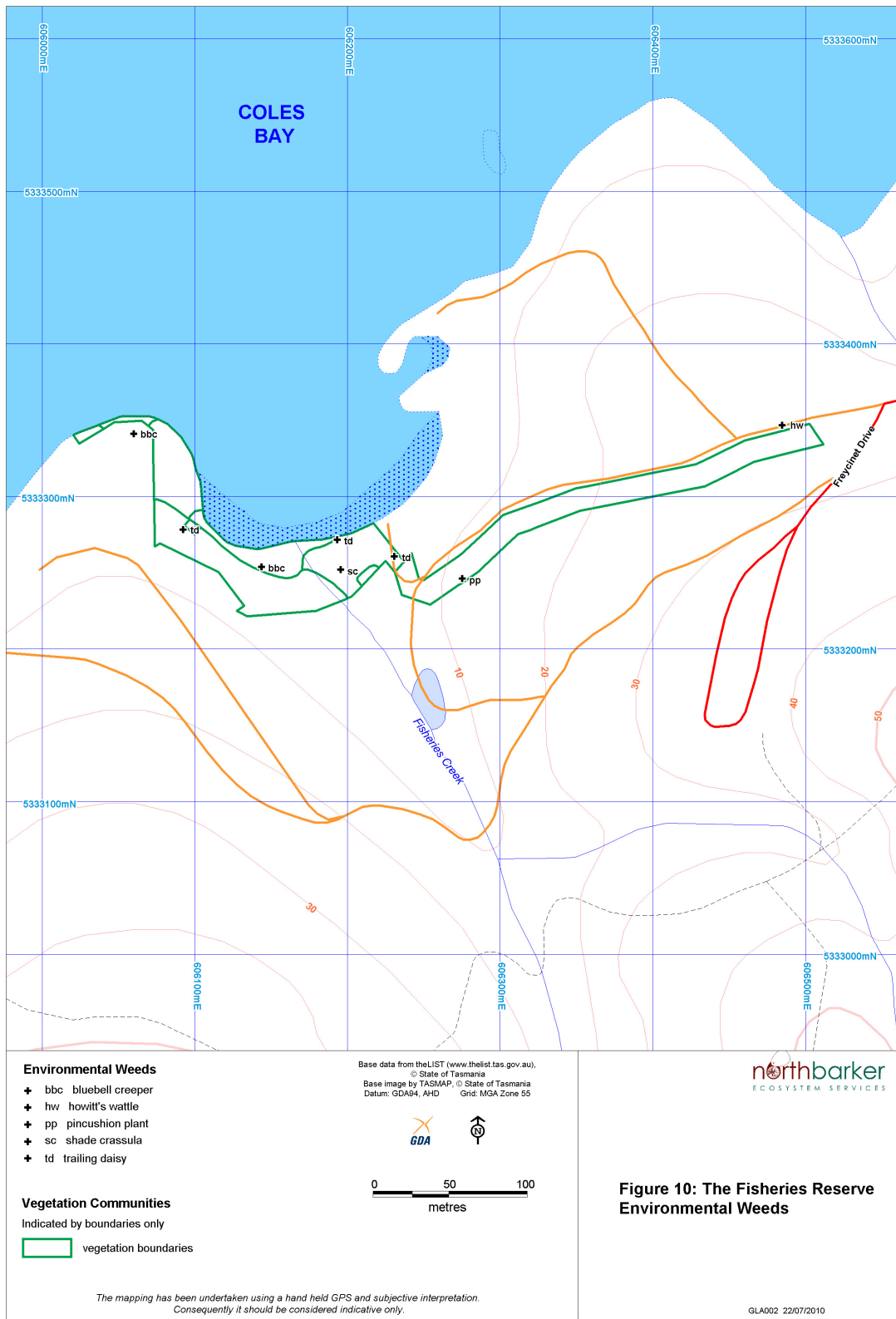
*Allocasuarina verticillata* forest (NAV) – This community occurs on the edge of the beach and along the rocky section of foreshore. At edge of the beach there are few native species present below the canopy of drooping sheoak.

Along the rocky section drooping sheoaks occur as low trees and white kunzea is the dominant shrub. Sedges commonly occur in the ground layer and coast speargrass is common at the edge of the community along the rocks.

The condition of this community along the rocks is excellent. However, near the beach the ground is extensively carpeted with creeping garden plants.







## **4. OTHER RESERVE VALUES**

### **4.1 CULTURAL HERITAGE**

- **Aboriginal heritage**

The Reserves hold cultural significance for the contemporary Aboriginal community. Cultural heritage values connect contemporary Aboriginal Tasmania with the people and events of the past. The Toorernomairremener band from the Oyster Bay nation occupied the area at the time of European arrival.

- **Post European settlement heritage**

The Post European settlement heritage values of the Reserves are closely linked with the histories of the town and the municipality. These have been documented in various publications, including Davenport & Amos (1988) and Guiler (1998).

Many other publications and historical documents and photographs on both Aboriginal and Post European Settlement heritage are housed at the Glamorgan Spring Bay Historical Society Inc, which is located at 22 Franklin Street, Swansea.

### **4.2 RECREATIONAL VALUES**

Both residents and visitors use the Reserves for a wide range of passive and active recreational activities. These include beach use, walking, jogging, dog exercise, wildlife viewing and fishing. Other facilities also provide additional recreational opportunities. These include barbeque and picnic areas, childrens' playground and access to boat ramps.

### **4.3 EDUCATIONAL VALUES**

All the reserves in the Glamorgan Spring Bay area have educational value, whether it be as an outdoor classroom for our local schoolchildren or for visitors to the area interested in our natural and cultural history. There are many opportunities to communicate the many values of our reserves to the locals and visitors alike, whether that be through interpretation signage, walk and talks over the summer months or information brochures and articles in the local newsletters. In the future other technology could be utilised such as smart phones to provide interaction educational experiences

### **4.4 SUMMARY OF OTHER VALUES**

Although there are many other values in our reserves this plan focuses on the management of the native vegetation and associated biodiversity values. Other values particularly recreational values are addressed through other processes and resourcing avenues such as Council's capital works and renewal programs for walking tracks, recreational facilities, parks and gardens.

## 5. MANAGEMENT ISSUES

### 5.1 NATIVE VEGETATION, FLORA, FAUNA AND SIGNIFICANT TREES

Maintaining the natural values of the Reserves is a primary objective of management. Protecting native vegetation communities is the most effective way of conserving flora and fauna values. A high priority should be given to managing threatening processes or activities that are likely to have an impact on species and communities of high conservation significance that are listed under various legislation.

Within the Reserves these include seven species of threatened flora, at least one of which occurs in each Reserve. Core habitat of the new-holland mouse is present in one Reserve and foraging habitat is present in, and close to, some Reserves for other threatened mammal and bird species. These flora and fauna species are variously listed under the TSPA and/or EPBCA. Five vegetation communities listed as threatened under the NCA are also present in the Reserves. Four of them occur in the Coastal Reserve and one in the Harold St Reserve. Legislative obligations in relation to threatened species and communities are provided in Appendix 4.

In addition to the many trees within the native vegetation communities and within areas mapped as 'FUR – parkland with remnant native trees', there are several large mature and old-growth eucalypts present on the roadsides in the Coastal Reserve. As these trees senesce they often form tree hollows which are important nesting habitat for many native birds and small mammals. Regeneration of trees within forest communities is vital to ensure the persistence of each community.

All mature trees are significant from a conservation perspective as well as from an aesthetic and visual perspective. Management should aim to retain as many trees as possible. Whilst some trees may be perceived as 'dangerous', it does not necessarily follow that they should be felled. Removing potentially dangerous limbs may be all that is required.

**Recommendation 1** – Train Council staff who are involved with day-to-day management of the Reserves to recognise the natural values present and provide them with strategies to protect these values during management activities, including protocols to prevent the spread of *Phytophthora cinnamomi*.

### 5.2 WEEDS

The Glamorgan Spring Bay Weed Management Plan (GSBWMP) and the Greater Coles Bay Weed Action Plan (GCBWAP)<sup>5</sup> recognise that weeds are one of the most serious threats to the natural environment. Any plant growing outside its natural range is a potential weed that may have a detrimental effect on the natural values of reserves. Management objectives include eradicating weeds or preventing or minimising their spread to native vegetation communities.

With the exception of the Unnamed Reserve, all Reserves contain at least some environmental weeds. However, it is recognised that that substantial progress has been made in reducing the levels of weed infestation through community actions as well as ongoing day-to-day management activities. Declared weeds are to a large extent under

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<sup>5</sup> Glamorgan Spring Bay Natural Resource Management Committee 2008; Coles Bay Weed Action Group 2008

control although some are still present. Environmental weeds are more widespread but are patchily distributed. There are some localised areas of significant infestation. Notably these include two areas in the northern part of the Coastal Reserve that support a number of weed species. The survey conducted for this Plan provides a detailed inventory of all significant weeds that forms the basis for a more strategic approach to their management.

It is important in weed management planning in an urban context to recognise the futility of eliminating all non-native species. Hence, in areas of parkland with a ground cover of introduced grasses and herbs the focus of weed management should be on containment.

Priorities for weed control should focus on declared and other environmental weeds that are having, or have the potential to have, a negative impact upon the native flora and which are also manageable. Therefore a hierarchy of priorities has been developed for weeds in the Reserves, which are applied to each species in Tables 3A and 3B. The priority system is as follows, where 1 is the highest priority and 3 is the lowest:

Priority	Reasons for priority rating
<b>1</b>	Declared weeds, and/or
	Easily controlled or eradicated, and/or
	Only small infestations or small numbers of infestations are present, and/or
	Likely to spread quickly.
<b>2</b>	Requires a substantial time allocation due to the size of infestations, and/or
	Creepers that require all plant parts to be remove, and/or
	Unlikely to spread quickly.
<b>3</b>	Plantings that require monitoring only to ensure that they do not spread.
	Large infestations that would require substantial investment in rehabilitation of the site.
<b>NB: -Plants with more than one priority rating in Tables 3A &amp; 3B indicate that infestations in different locations vary in size and/or manageability. -Most plants will require monitoring for re-emergence and follow-up control.</b>	

**Table 3A. Priorities for declared weeds in the Reserves.**

\* Observations = the number of general locations across the Reserves where it was observed.

Common name	Scientific name	Observations *	Priority
Blackberry	<i>Rubus fruticosus</i>	1	2
Bridal creeper	<i>Asparagus asparagoides</i>	1	1
Montpellier broom	<i>Genista monspessulana</i>	1	1



**Table 3B. Priorities for other environmental weeds in the Reserves.**

\* Observations = the number of general locations across the Reserves where it was observed.

\*\* Priority 1 = outlying, small infestations or small plants.

Common name	Scientific name	Observations *	Priority
Sweet pittosporum	<i>Pittosporum undulatum</i>	43	1 & 2 **
Mirrorbush	<i>Coprosma repens</i>	14	1 & 2 **
Trailing daisy	<i>Osteospermum fruticosum</i>	8	1
Blue marguerite	<i>Felicia amelloides</i>	4	1
Howitts wattle	<i>Acacia howittii</i>	4	3
Nasturtium	<i>Tropaeolum major</i>	4	1 & 2 **
Blue butterfly bush	<i>Psoralea pinnata</i>	3	1 & 2 **
Bluebell creeper	<i>Billardiera fusiformis</i>	3	1
Dolichos pea	<i>Dipogon lignosus</i>	3	1 & 2 **
Ivy	<i>Hedera helix</i>	3	2
Milkwort	<i>Polygala myrtifolia</i>	3	1
Shade crassula	<i>Crassula multicava</i>	3	2
Blackberry nightshade	<i>Solanum nigrum</i>	2	1 & 2 **
Cape ivy	<i>Delairea odorata</i>	2	1 & 2 **
Grevillea hybrid	<i>Grevillea</i> sp.	2	1
Agapanthus	<i>Agapanthus praecox</i> subsp. <i>orientalis</i>	1	2
Banana passionfruit	<i>Passiflora tarminiana</i>	1	1
Bears breeches	<i>Acanthus mollis</i>	1	2
Blue periwinkle	<i>Vinca major</i>	1	2
Cootamundra wattle	<i>Acacia baileyana</i>	1	3
Gum (planted)	<i>Eucalyptus</i> sp.	1	3
Japanese honeysuckle	<i>Lonicera japonica</i>	1	2
Lignum	<i>Muehlenbeckia complexa</i>	1	2
Lions ear	<i>Leonotis leonurus</i>	1	2
Madeira broom	<i>Genista stenopetala</i>	1	1
Montbretia	<i>Crocsmia Xcrocsmiiflora</i>	1	2
Pincushion plant	<i>Hakea laurina</i>	1	3
Red valerian	<i>Centranthus ruber</i>	1	2
Sea spurge	<i>Euphorbia paralias</i>	1	1
Tree lucerne	<i>Chamaecytisus palmensis</i>	1	1

**Recommendation 2 – Control Priority 1 weeds (see Tables 3A and 3B).**

**Recommendation 3 – Control Priority 2 weeds (see Tables 3A and 3B).**

**Recommendation 4 – Regularly monitor for re-growth of Priority 1 and 2 weeds, as well as the spread of Priority 3 weeds, and take follow-up control action as necessary.**

It is also important to acknowledge that the presence of most weeds recorded is probably a consequence of the proximity of the Reserves to urban areas and associated gardens, which provide a source of ongoing infestation. Therefore, in conjunction with direct on-ground weed control actions, a campaign to educate residents about the consequences associated with garden escapes and garden waste dumping on the Reserves should be ongoing.

**Recommendation 5 – Continue to raise community awareness of the values present in their local environment focusing on the threats posed to these values most notably by garden escape plants and dumping of garden cuttings. Such a campaign could include:**

- making this Plan publicly available through the GSBC website,
- a public presentation/workshop,
- brochures/posters/articles in local news letter, and
- field days and working bees.

### **5.3 ILLEGAL CLEARING OF VEGETATION**

Intermittently Council receives reports of illegal clearing of trees and other foreshore vegetation. Usually it is difficult for Council to apprehend or prosecute offenders. One strategy adopted in recent times has been to erect signs indicating that vegetation has been cleared from public land without authorisation and that the sign will remain in place until the vegetation has regrown.

Future alternative strategies could include the erection of Bush Watch signs. Bush Watch is a Tasmania Police initiative that encourages the public to report unusual, suspicious or criminal activity and vandalism to the Police. The signs provide a phone number (131 444), which is a direct link to the police. The GSBC Natural Resource Management (NRM) Committee is a member of Bush Watch.

**Recommendation 6 – Raise community awareness of the problem illegal clearing, outlining the legislative implications and encouraging people to report offender to the police. This should be in conjunction with Recommendation 5, but also may involve the erection of signage, such as ‘Bushwatch’ signs. Investigate the development of a ‘by-law’ that addresses the illegal clearing of vegetation on Council managed public land.**

### **5.4 RESERVE BOUNDARIES**

In managing any reserve it is obviously important that reserve boundaries are known to both reserve managers and adjacent land owners. There are issues of undefined boundaries in all of the Reserves with the exception of the Unnamed Reserve and, perhaps as a consequence, some gardens have encroached onto the Reserves to varying degrees.

On-ground marking of undefined boundaries may be necessary in some instances in order to clarify the council's authority in implementing some of the actions required to protect the Reserve values. Such on-ground markers could include fencing or a row of large boulders. Alternatively it may merely require a verbal recognition by other land owners.

**Recommendation 7 - Clarify Reserve boundaries for each Reserve. Liaise with landowners regarding the most appropriate way to more clearly define these boundaries and, where deemed necessary, install on-ground boundary markers.**

## **5.5 COASTAL EROSION**

Coastal erosion is often a natural process. For example, long shore drift results in the alternating process of seasonal erosion and accretion of sandy beaches. In the longer term coastal erosion is likely to be exacerbated by climate change and associated rises in sea level and increases in the size of storm surge.

Sandy shores, such as sections of the Coastal Reserve and The Fisheries, are the most susceptible to coastal erosion. Erosion can also be exacerbated by uncontrolled foreshore access, although this does not appear to be a significant issue in the Coles Bay Reserves.

**Recommendation 8 – Establish long-term photo-point monitoring sites at all the beaches in the Reserves in order to plan for future rehabilitation or other amelioration measures.**

## **5.6 PLANTINGS AND REVEGETATION**

Plantings of introduced or non-local native species within the Reserves are present in a few locations. However, the use of introduced or non-local native species should be considered carefully. Many have the potential to 'escape' into native vegetation and exacerbate the problem of environment weeds, which in turn leads to the degradation of Reserves' natural values.

In consultation with the local community, any future plantings should preferably use local native species, which have a number of benefits. They are adapted to the local climate and soil and consequently require less maintenance, including watering, and the risk of escape resulting in degradation of the natural values is nullified. Furthermore, local native plants also attract and provide habitat for native birds, which in turn are natural pest control agents as well as providing pleasure to a great number of people.

Following weed control, it is preferable to allow areas to naturally regenerate with native species. However, if there is little or no nearby source of native species seed or other regenerative parts then weed invasion may be ongoing. In such cases revegetation is likely to be required. Any of the native species listed in Appendix 2 are appropriate for revegetation work, as well as other plantings, in the Reserves.

**Recommendation 9 – In consultation with the local community, any plantings and revegetation work should preferably use local native species.**

## **5.7 FIRE**

The primary objective of fire management in reserves is to protect human life and property from fire. Other objectives include the maintenance of biodiversity through appropriate fire regimes and the of protection conservation values from the adverse impacts of fire in so far as these are consistent with the primary objective.

A fire management plan for the Reserves should be developed in the context of the Coles Bay Emergency Management Plan that is currently under development. The fire management plan should include the following:

- a clear definition of long-term goals and required outcomes in relation to fire hazard reduction and in maintaining biodiversity values,
- consideration of the Reserves in a broader landscape context, which is particularly pertinent to the Unnamed Reserve that is part of a continuum of vegetation relatively remote from the urban part of Coles Bay,
- consideration of the legislative obligations with regard to threatened species and communities when implementing a fire plan.

The following comments and the information provided in Table 4 includes factors to be considered in the plan in relation to maintaining biodiversity values.

Many native vegetation communities and plant species require fire to trigger regeneration. Conversely, some communities and species are killed by fire depending on factors such as their growth stage, fire frequency and fire intensity. Therefore the maintenance of a mosaic of fire age classes is preferable. Total exclusion of fire may result in periodic and devastating hot summer wildfires. Conversely, over frequent and comprehensive fuel reduction burning will also modify the structure and composition of vegetation.

However, the use of fire as a tool to reduce fuel loads in urban reserves can be controversial as well as hazardous to people and property. Furthermore, maintaining biodiversity values whilst minimising wildfire hazard may not always necessarily require the use of fire in some vegetation communities. Therefore alternative approaches, such as raking litter and removing dead wood by hand, should also be considered.

Table 4 provides general recommendations by vegetation category and community in relation to the use of fire as a management tool in order to promote biodiversity values in the Reserves.

**Table 4. Recommended fire regimes by vegetation category and community.**

Vegetation category	TASVEG Community	Recommended fire regime <sup>6</sup>
Coastal vegetation	SAC	- Exclude fire. Fires can lead to de-stabilisation of coastal landforms such as sand dunes.
	GHC	
	FMG	
Heathland	SHW	<p>- General recommended fire frequency of 10 to 30 years depending on the growth of shrubs and the decline in the number of plant species. If the community is converting to scrub and there is a decline in the number of smaller plants then burning will be beneficial. If the converse is true then there is no reason to burn for biodiversity conservation.</p> <p>- Burns should preferably be conducted in autumn rather than spring.</p> <p>- Fire intensity should be enough to scorch foliage but limit killing of plants.</p>
	SHG	
Shrubby eucalypt forest	DOV	<p>- General recommended fire frequency of 20 to 40 years. A greater frequency would reduce the shrub layer and lower frequency may result in a conversion to wet forest.</p> <p>- Moderately hot burns are preferable to cool burns. Burns should at least remove the ground litter.</p>
	DGL	
Heathy eucalypt forest	DOW	- General recommended fire frequency 15 to 30 years. A range of fire intervals is required to maintain biodiversity. Too frequent fires will promote the domination of bracken or increase soil erosion.
	DAC	
Coastal eucalypt forest	DVC	- Exclude fire. This community occurs in the Coastal Reserve on a steep sand dune and, similarly to other coastal vegetation, fire may lead to de-stabilisation of the dune.
Non-eucalypt forest	NCR	<p>- Excluding fire. This is the best management option as <i>Callitris rhomboidea</i> is susceptible to fire.</p> <p>- However, low intensity fire under mature trees with most of their foliage well above ground level may prevent high intensity fires that will kill trees.</p> <p>- A low intensity fire should be conducted in a mosaic leaving some areas unburnt as fire also prevents regeneration of <i>C. rhomboidea</i>.</p>
	NAV	<p>- Exclude fire.</p> <p>- However, a woodland formation is more valuable for nature conservation than a forest formation as a more open canopy in this forest type supports a greater diversity of understorey species than a closed canopy. Therefore a periodic assessment should be made of this community with regard to fire. Any fires should be of low frequency and intensity and conducted in a mosaic pattern. Alternate means of thinning may be preferable in some instances.</p>

**Recommendation 10 – Develop a fire management plan for the Reserves within the framework of the Coles Bay Emergency Management Plan.**

<sup>6</sup> Wood & Knee 1999



## **5.8 PLAN REVIEW**

This Native Flora and Fauna Management Plan covers the 5 year period from 2014 to 2019. A review of the Plan, including the success in achieving its objectives, is due to be conducted in 2019 and an updated Plan will be developed. This process will be ongoing for each consecutive 5 year period.

**Recommendation 11 – Review the current Native Flora and Fauna Management Plan near the end of the current 5 year period, including the success in achieving its objectives, and develop a Plan for the period 2020 to 2024.**

## **6. ACTION PLANS**

The following tables provide action plans that are based on the above recommendations. Table 6.1 is a weed management action plan and Table 6.2 includes all other actions. Each action has been assigned a recommended time frame and a performance measure.

With regard to weeds, the distribution of the environmental weeds recorded during the survey is provided in Figures 3, 6, 8 and 10 and a photo of each weed is provided in Appendices 5A and 5B. The maps and photos should be used as a resource to guide and direct weed control actions. However, the maps should be used with caution as the point locations of weeds were recorded with a hand-held gps. with a potential error of several metres. Furthermore, the maps should not be considered as a comprehensive guide as some weeds may have emerged since surveys were undertaken and others may have been missed. Additionally, as weed control is an ongoing task performed by Council Officers, some weeds may have already been treated.

## 6.1 WEED ACTION PLAN

Recommendation No.	Recommendation / Action	Timing	Performance Measure
2	Control Priority 1 weeds. (See Tables 3A & 3B and Appendices 5A and 5B).	Ongoing	Eradication of weeds, or at least, a reduction in weed abundance each year.
3	Control Priority 2 weeds. (See Tables 3A & 3B and Appendices 5A and 5B).	Ongoing following initial control of Priority 1 weeds	Eradication of weeds, or at least, a reduction in weed abundance each year.
4	Monitor for re-growth of Priority 1 and 2 weeds, Monitor for the spread of Priority 3 weeds, and Take follow-up control action as necessary.	At least once a year in Spring and opportunistically	Minimise new weed infestations.
11	Review the success of weed control actions through further weed mapping and develop a new weed action plan.	July-December 2019	New weed action plan in place for 2020-2024.

## 6.2 GENERAL ACTION PLAN

Recommendation No.	Recommendation / Action	Timing	Performance Measure
1	Train Council staff who are involved with day-to-day management of the Reserve to recognise the natural values present and provide them with strategies to protect these values during management activities, including protocols to prevent the spread of <i>Phytophthora cinnamomi</i> .	2014 – early 2015	Education of Council staff and added protection of Reserve natural values.
5	Continue to raise community awareness of the values present in their local environment focusing on the threats posed to these values most notably by garden escape plants and dumping of garden cuttings. Such a campaign should include: - making this Plan publicly available through the GSBC website, - a public presentation/workshop, - brochures/posters/articles in local news letter, and - field days and working bees.	Ongoing	Education of community and reduction of risk of new weed infestations.
6	Raise community awareness of the problem illegal clearing, outlining the legislative implications and encouraging people to report offenders to the police. This should be combined with Recommendation 5, but also involve the erection of signage, such as 'Bushwatch' signs. These signs provide a phone number (131 444) which is a direct link to the police.	Ongoing	Education of community and reduction of risk and reports of illegal clearing.
	Investigate the development of a 'by-law' that addresses the illegal clearing of vegetation on Council managed public land.	2015	Investigation complete.
7	Clarify Reserve boundaries on-the-ground as outlined in section 5.5. Liaise with landowners regarding the most appropriate way to more clearly define these boundaries.		
	Survey boundary line and liaise with landowners  Install boundary markers as necessary	2015  2016	Clarification of reserve boundary locations.

Recommendation No.	Recommendation / Action	Timing	Performance Measure
8	<p>Establish long-term photo-point monitoring sites at all the beaches in the Reserves in order to plan for future rehabilitation or other amelioration measures.</p> <p>Establish monitoring sites</p> <p>Monitor</p>	<p>2015</p> <p>Twice each year</p>	Record of coastal erosion.
9	In consultation with the local community, any plantings and revegetation work should preferably use local native species.	As required	Natural values of Reserve enhanced.
10	Develop a fire management plan for the Reserves within the framework of the Coles Bay Emergency Management Plan.	2014	Completion of a fire management plan.
11	Review the current Native Flora and Fauna Management Plan near the end of the current 5 year period, including the success in achieving its objectives, and develop a Plan for the period 2020 to 2024.	2019	Publication of Plan for 2020-2024.

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## **APPENDIX 1 – SURVEY METHODS**

### **Background Research**

The following sources were used for biological records from the region:

- Natural Values Atlas<sup>7</sup> - all threatened plant and animal records within 5 km of the study area plus potential suitability for other threatened fauna.

### **Botanical and Vegetation Survey**

All Reserves were visited at least twice during surveys that were undertaken in late winter to spring 2009 and in autumn 2010. The vegetation was mapped and all vascular plant species were recorded. The location of significant features, including threatened plants and weeds, were recorded by a hand-held GPS. Botanical nomenclature follows the current census of Tasmanian plants<sup>8</sup>.

### **Fauna Habitat Assessment**

The study area was assessed for fauna habitat with respect to threatened fauna species known from the area, or considered to potentially occur there. This assessment was based on the overall structure of the vegetation including identification of factors such as the presence of old growth trees with hollows and logs. Evidence of native animal presence, such as scats and burrows, were also noted.

### **Assessment of Conservation Significance**

Vegetation types have been classified according to TASVEG<sup>9</sup>. The conservation status of a vegetation type relates to its current extent compared with the modelled extent prior to European settlement. This has allowed an estimate of the extent of loss to land clearing to be calculated. A 2007 amendment to the *Nature Conservation Act 2002* included the listing of threatened native vegetation communities in accordance with their conservation status.

The conservation significance of species is determined at a state and federal level by legislation (*Tasmanian Threatened Species Protection Act 1995* and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*), the implications of which are considered in the light of relevant legislation (Appendix 4).

### **Limitations/Disclaimer**

While surveys were undertaken in late winter, spring and autumn, no botanical survey can guarantee that all vascular plants will be recorded due to the limitations of the sampling technique, seasonal and annual variation in abundance and the possible absence of fertile material for identification. Additional species are likely to occur that may be recorded by repeated visits over several years and at different seasons.

Fauna assessment is limited to the identification of habitat of significant fauna species known from the area.

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<sup>7</sup> Natural Values Reports # 39638 & 39639 (30 June 2010), Threatened Species Section, DPIPW

<sup>8</sup> Buchanan 2009

<sup>9</sup> Harris & Kitchener 2005

## APPENDIX 2 – VASCULAR PLANT SPECIES LIST

**Status codes:**

ORIGIN

i - introduced

d - declared weed WM Act

en - endemic to Tasmania

t - within Australia, occurs only in Tas.

NATIONAL SCHEDULE

EPBC Act 1999

CR - critically endangered

EN - endangered

VU - vulnerable

STATE SCHEDULE

TSP Act 1995

e - endangered

v - vulnerable

r - rare

**Sites:**

1	DOV - Coastal Reserve - E606174, N5335880	21/10/2009	Nicky Meeson
2	DOW - Coastal Reserve - E606065, N5336021	21/10/2009	Nicky Meeson
3	DVC - Coastal Reserve - E606151, N5335933	21/10/2009	Nicky Meeson
4	DGL - Coastal Reserve - E606648, N5335315	3/10/2009	Nicky Meeson
5	NAV - Coastal Reserve - E606120, N5335273	3/10/2009	Nicky Meeson
6	SAC - Coastal Reserve - E606118, N5335962	21/10/2009	Nicky Meeson
7	GHC - Coastal Reserve - E605985, N5335618	3/10/2009	Nicky Meeson
8	FMG - Coastal Reserve - E606078, N5335953	21/10/2009	Nicky Meeson
9	FUR-parkland - Coastal Reserve - E606100, N5335808	3/10/2009	Nicky Meeson
10	FUR-other - Coastal Reserve - E606512, N5335249	3/10/2009	Nicky Meeson
11	DAC - Unnamed Reserve - E606220, N5336260	24/09/2009	Nicky Meeson
12	SHW - Unnamed Reserve - E606215, N5336185	24/09/2009	Nicky Meeson
13	DAC - Rita & Doris Reserve - E606470, N5335785	20/10/2009	Nicky Meeson
14	SHG - Rita & Doris Reserve - E606420, N5335815	20/10/2009	Nicky Meeson
15	FUR-other - Rita & Doris Reserve - E606400, N5335725	20/10/2009	Nicky Meeson
16	NCR - Harold St Reserve - E606250, N5335575	6/08/2009	Nicky Meeson
17	FUR-parkland - Harold St Reserve - E606325, N5335540	6/08/2009	Nicky Meeson
18	FUR-other - Harold St Reserve - E606360, N5335610	6/08/2009	Nicky Meeson
19	DAC - The Fisheries - E606480, N5335335	21/10/2009	Nicky Meeson
20	NAV - The Fisheries - E606200, N5333250	21/10/2009	Nicky Meeson

Site	Name	Common name	Status
<b>DICOTYLEDONAE</b>			
<b>ACANTHACEAE</b>			
1	<i>Acanthus mollis</i>	bears breeches	i
<b>AIZOACEAE</b>			
3 4 5 6 8	<i>Carpobrotus rossii</i>	native pigface	
13 16			
5 7	<i>Disphyma crassifolium subsp. clavellatum</i>	roundleaf pigface	
3 4 5 6 7 8	<i>Tetragonia implexicoma</i>	bower spinach	
9 17			
<b>APIACEAE</b>			
4 5 7	<i>Apium prostratum</i>	sea celery	
19	<i>Hydrocotyle hirta</i>	hairy pennywort	
13 16	<i>Xanthosia pilosa</i>	woolly crossherb	
5 13 14	<i>Xanthosia tridentata</i>	hill crossherb	
<b>APOCYNACEAE</b>			
10	<i>Vinca major</i>	blue periwinkle	i
<b>ARALIACEAE</b>			
10	<i>Hedera helix</i>	ivy	i
<b>ASTERACEAE</b>			
8	<i>Actites megalocarpus</i>	dune thistle	
11	<i>Cassinia aculeata</i>	dollybush	
5 15 20	<i>Chrysocephalum apiculatum</i>	common everlasting	
12 13 15	<i>Cirsium vulgare</i>	spear thistle	i
19			
5 11 12 13	<i>Coronidium scorpioides</i>	curling everlasting	
16			
1 9	<i>Delairea odorata</i>	cape ivy	i
16 19 20	<i>Euchiton collinus</i>	common cottonleaf	
5 16 18	<i>Felicia amelloides</i>	blue marguerite	i
5	<i>Hypochoeris glabra</i>	smooth catsear	i
1 3 5 8 12	<i>Hypochoeris radicata</i>	rough catsear	i
13 15 16			

5 13 16	<i>Olearia ramulosa</i>	twiggy daisybush	
4 9 10 13 15 16 20	<i>Osteospermum fruticosum</i>	trailing daisy	i
5	<i>Senecio quadridentatus</i>	cotton fireweed	
1 3 4 5 6 8	<i>Senecio sp.</i>	groundsel	
5 19	<i>Sonchus oleraceus</i>	common sowthistle	i
5 20	<i>Taraxacum officinale</i>	common dandelion	i
	<b>BRASSICACEAE</b>		
5 8 19 20	<i>Cakile edentula</i>	american searocket	i
5	<i>Sisymbrium officinale</i>	hedge-mustard	i
	<b>CAMPANULACEAE</b>		
5	<i>Lobelia anceps</i>	angled lobelia	
4 5 13 16	<i>Wahlenbergia sp.</i>	bluebell	
	<b>CAPRIFOLIACEAE</b>		
1	<i>Lonicera japonica</i>	japanese honeysuckle	i
	<b>CASUARINACEAE</b>		
4 11 13 14 15 16 17 19	<i>Allocasuarina littoralis</i>	black sheoak	
11	<i>Allocasuarina monilifera</i>	necklace sheoak	en
3 4 5 6 9 19 20	<i>Allocasuarina verticillata</i>	drooping sheoak	
	<b>CHENOPODIACEAE</b>		
7 8	<i>Atriplex prostrata</i>	creeping orache	i
1 3 4 5 6 9 16	<i>Rhagodia candolleana subsp. candolleana</i>	coastal saltbush	
5 7	<i>Sarcocornia quinqueflora</i>	beaded glasswort	
5	<i>Threlkeldia diffusa</i>	coast bonefruit	
	<b>CONVOLVULACEAE</b>		
3 5 19 20	<i>Dichondra repens</i>	kidneyweed	
	<b>CRASSULACEAE</b>		
4 10 20	<i>Crassula multicava</i>		i
3 5 8 14 19 20	<i>Crassula sieberiana</i>	stone-crop	
	<b>CUNONIACEAE</b>		
11	<i>Bauera rubioides</i>	wiry bauera	
	<b>DILLENIAEAE</b>		
13	<i>Hibbertia empetrifolia subsp. empetrifolia</i>	scrambling guineaflower	
11	<i>Hibbertia procumbens</i>	spreading guineaflower	
2 3 11 13 16	<i>Hibbertia riparia</i>	erect guineaflower	
	<b>DROSERACEAE</b>		
11 14 16	<i>Drosera peltata subsp. peltata</i>	pale sundew	
	<b>EPACRIDACEAE</b>		
13 16	<i>Acrotriche serrulata</i>	ants delight	
5 13 14 16	<i>Astroloma humifusum</i>	native cranberry	
5 13 14 16	<i>Astroloma pinifolium</i>	pine heath	
13 14 16	<i>Brachyloma depressum</i>	spreading heath	r
2 4 11 13 14 16	<i>Epacris impressa</i>	common heath	
12	<i>Epacris obtusifolia</i>	bluntleaf heath	
13	<i>Leucopogon collinus</i>	white beardheath	
1 3 4 5 6 8 13 16 19	<i>Leucopogon parviflorus</i>	coast beardheath	

20			
11 13 16	<i>Leucopogon virgatus</i>	common beard-heath	
16	<i>Lissanthe strigosa</i>	peach berry	
16	<i>Monotoca elliptica</i>	tree broomheath	
12	<i>Sprengelia incarnata</i>	pink swampheath	
11	<i>Styphelia adscendens</i>	golden heath	
	<b>EUPHORBIACEAE</b>		
13 17	<i>Amperea xiphoclada</i> var. <i>xiphoclada</i>	broom spurge	
7	<i>Euphorbia paralias</i>	sea spurge	i
9	<i>Phyllanthus gunnii</i>	shrubby spurge	
5	<i>Poranthera microphylla</i>	small poranthera	
	<b>FABACEAE</b>		
11 13 14	<i>Aotus ericoides</i>	golden pea	
16			
3 4 5 13	<i>Bossiaea cinerea</i>	showy bossia	
16 19			
5 16	<i>Bossiaea prostrata</i>	creeping bossia	
1	<i>Chamaecytisus palmensis</i>	tree lucerne	i
19	<i>Daviesia ulicifolia</i>	spiky bitterpea	
3 11 19	<i>Dillwynia glaberrima</i>	smooth parrotpea	
14	<i>Dillwynia sericea</i>	showy parrotpea	
1 4	<i>Dipogon lignosus</i>	dolichos pea	i
10	<i>Genista monspessulana</i>	canary broom	d
16	<i>Genista stenopetala</i>	madeira broom	i
3 13	<i>Glycine clandestina</i>	twining glycine	
11 12	<i>Gompholobium huegelii</i>	common wedgepea	
5 13 16	<i>Kennedia prostrata</i>	running postman	
5 13 16	<i>Platylobium triangulare</i>	arrow flatpea	
1	<i>Psoralea pinnata</i>	blue butterflybush	i
19	<i>Pultenaea daphnoides</i> var. <i>obcordata</i>	heartleaf bushpea	
11	<i>Sphaerolobium minus</i>	eastern globepea	
1 15	<i>Trifolium repens</i>	white clover	i
	<b>FUMARIACEAE</b>		
1 15	<i>Fumaria muralis</i> subsp. <i>Muralis</i>	wall fumitory	i
	<b>GENTIANACEAE</b>		
4 5 16	<i>Centaurium erythraea</i>	common centaury	i
	<b>GERANIACEAE</b>		
5	<i>Pelargonium australe</i>	southern storksbill	
	<b>GOODENIACEAE</b>		
11 12	<i>Dampiera stricta</i>	blue dampiera	
13 16	<i>Goodenia lanata</i>	trailing native-primrose	
4 7 19	<i>Selliera radicans</i>	shiny swampmat	
	<b>HALORAGACEAE</b>		
4 5 11 13	<i>Gonocarpus humilis</i>	shade raspwort	
16			
12	<i>Gonocarpus micranthus</i> subsp. <i>micranthus</i>	creeping raspwort	
13 15 16	<i>Gonocarpus tetragynus</i>	common raspwort	
	<b>LAMIACEAE</b>		
1	<i>Leonotis leonurus</i>	lions ear	i
	<b>LAURACEAE</b>		
11	<i>Cassytha glabella</i>	slender dodderlaurel	
1 2 3 5	<i>Cassytha pubescens</i>	downy dodderlaurel	
	<b>MIMOSACEAE</b>		
5	<i>Acacia baileyana</i>	cootamundra wattle	i
11	<i>Acacia genistifolia</i>	spreading wattle	

13 16 19	<i>Acacia howittii</i>	howitt's wattle	
1 5 11 12 16	<i>Acacia longifolia subsp. longifolia</i>	sydney coast wattle	
1 3 6 8 11 13 19 20	<i>Acacia longifolia subsp. sophorae</i>	coast wattle	
1 2 4 5 16	<i>Acacia mearnsii</i>	black wattle	
1 2 4 5 9	<i>Acacia melanoxylon</i>	blackwood	
13 16	<i>Acacia myrtifolia</i>	redstem wattle	
5 11 13 14 15 16 19	<i>Acacia suaveolens</i>	sweet wattle	
5 11 13 14 16 19	<i>Acacia terminalis</i>	sunshine wattle	
4 5 19	<i>Acacia verticillata</i>	prickly mimosa	
	<b>MYOPORACEAE</b>		
5	<i>Myoporum insulare</i>	common boobialla	
	<b>MYRTACEAE</b>		
13 14 19	<i>Calytrix tetragona</i>	common fringemyrtle	
2 4 5 11 13 14 16 17 19	<i>Eucalyptus amygdalina</i>	black peppermint	en
4 10	<i>Eucalyptus globulus subsp. globulus</i>	tasmanian blue gum	
1 2 5 9 11 12	<i>Eucalyptus ovata var. ovata</i>	black gum	
13	<i>Eucalyptus sp.</i>	gum	
1 3 4 5 9 10 13 16 17 19 20	<i>Eucalyptus viminalis subsp. viminalis</i>	white gum	
11	<i>Euryomyrtus ramosissima</i>	heath-myrtle	
2 4 5 11 12 13 14 15 16 19 20	<i>Kunzea ambigua</i>	white kunzea	
19	<i>Leptospermum glaucescens</i>	smoky teatree	en
2 11 12 15 19	<i>Leptospermum scoparium</i>	common tea-tree	
2 12	<i>Melaleuca gibbosa</i>	slender honeymyrtle	
19	<i>Thryptomene micrantha</i>	ribbed heathmyrtle	v
	<b>OXALIDACEAE</b>		
3 4 5 6 8 13 16 20	<i>Oxalis perennans</i>	grassland woodsorrel	
	<b>PASSIFLORACEAE</b>		
4 18	<i>Passiflora tarminiana</i>	banana passionfruit	i
	<b>PITTOSPORACEAE</b>		
16 19 20	<i>Billardiera fusiformis</i>	bluebell creeper	i
3 4 5 16 20	<i>Bursaria spinosa subsp. spinosa</i>	prickly box	
1 3 4 5 9 10 13 15 16 17 18	<i>Pittosporum undulatum</i>	sweet pittosporum	i
11	<i>Rhytidosporum procumbens</i>	starry appleberry	
	<b>PLANTAGINACEAE</b>		
5 15 16	<i>Plantago coronopus</i>	buckshorn plantain	i
1 5 15	<i>Plantago lanceolata</i>	ribwort plantain	i
5	<i>Plantago varia</i>	variable plantain	
	<b>POLYGALACEAE</b>		
11 12	<i>Comesperma calymega</i>	bluespike milkwort	

13 16 19	<i>Comesperma volubile</i>	blue lovecreeper	
13	<i>Polygala myrtifolia</i>	myrtleleaf milkwort	i
<b>POLYGONACEAE</b>			
1 5 12 15	<i>Acetosella vulgaris</i>	sheep sorrel	i
1 3 5 6 7 8 19 20	<i>Muehlenbeckia australis</i>	climbing lignum	
1	<i>Muehlenbeckia complexa</i>	lignum	i
<b>PRIMULACEAE</b>			
5 13 15	<i>Anagallis arvensis</i>	scarlet pimpernel	i
4 5 7 19	<i>Samolus repens</i>	creeping brookweed	
<b>PROTEACEAE</b>			
1 2 3 4 5 11 12 13 19	<i>Banksia marginata</i>	silver banksia	
11	<i>Conospermum hookeri</i>	tasmanian smokebush	en VU
<b>V</b>			
5 18	<i>Grevillea sp.</i>	grevillea hybrid	i
19	<i>Hakea laurina</i>	pincushion plant	i
2 11 12	<i>Hakea teretifolia subsp. hirsuta</i>	dagger needlebush	
5 11 13 16	<i>Persoonia juniperina</i>	prickly geebung	
<b>RHAMNACEAE</b>			
16	<i>Pomaderris apetala</i>	common dogwood	
4 5 11 13 16 19	<i>Pomaderris elliptica</i>	yellow dogwood	
13 14 16	<i>Spyridium vexilliferum var. vexilliferum</i>	helicopter bush	r
<b>ROSACEAE</b>			
1 5 7 8 12 13 15 16	<i>Acaena novae-zelandiae</i>	common buzzy	
1	<i>Rubus fruticosus</i>	blackberry	d
<b>RUBIACEAE</b>			
4 5 9 18	<i>Coprosma repens</i>	mirrorbush	i
1	<i>Galium aparine</i>	cleavers	i
<b>RUTACEAE</b>			
12	<i>Boronia parviflora</i>	swamp boronia	
11 12	<i>Boronia pilosa subsp. pilosa</i>	hairy boronia	
5 20	<i>Correa alba var. alba</i>	white correa	
4 5 13 14 16	<i>Correa reflexa</i>	correa	
11 13 16	<i>Philotheca virgata</i>	twiggy waxflower	
14	<i>Zieria littoralis</i>	downy zieria	r
<b>SANTALACEAE</b>			
1 3 4 5 9 11 13 14 16 19	<i>Exocarpos cupressiformis</i>	common native-cherry	
<b>SAPINDACEAE</b>			
4 5 13 16 19 20	<i>Dodonaea viscosa subsp. spatulata</i>	broadleaf hopbush	
<b>SOLANACEAE</b>			
1 13 15	<i>Solanum laciniatum</i>	kangaroo apple	
9 18	<i>Solanum nigrum</i>	blackberry nightshade	i
<b>THYMELAEACEAE</b>			
3 5	<i>Pimelea glauca</i>	smooth riceflower	
3 5 11 13 16	<i>Pimelea humilis</i>	dwarf riceflower	
4 9 16	<i>Tropaeolum majus</i>	nasturtium	



	<b>TREMANDRACEAE</b>		
11 13 16	<i>Tetradthea pilosa</i>	hairy pinkbells	
	<b>VALERIANACEAE</b>		
10	<i>Centranthus ruber</i>	red valerian	i
	<b>VIOLACEAE</b>		
5	<i>Viola hederacea</i>	ivy leaf violet	
	<b>GYMNOSPERMAE</b>		
	<b>CUPRESSACEAE</b>		
4 5 13 14 16 17 19 20	<i>Callitris rhomboidea</i>	oyster bay pine	
	<b>MONOCOTYLEDONAE</b>		
	<b>CENTROLEPIDACEAE</b>		
20	<i>Centrolepis strigosa</i>	hairy centrolepis, bristlewort	
	<b>CYPERACEAE</b>		
11	<i>Caustis pentandra</i>	thick twistsedge	r
3 5 6 7 19 20	<i>Ficinia nodosa</i>	knobby clubsedge	
5 13 14 16	<i>Gahnia microstachya</i>	slender sawsedge	
7	<i>Isolepis cernua</i>	nodding clubsedge	
2 3 4 5 6 11 12 13 14 16 17 19 20	<i>Lepidosperma concavum</i>	sand swordsedge	
11 12	<i>Lepidosperma filiforme</i>	common rapiersedge	
3 5	<i>Lepidosperma gladiatum</i>	coast swordsedge	
13 14 16 19	<i>Lepidosperma laterale</i>	variable swordsedge	
	<b>IRIDACEAE</b>		
1	<i>Crocasmia Xrocosmiiflora</i>	montbretia	i
11 12 13	<i>Patersonia fragilis</i>	short purpleflag	
	<b>JUNCACEAE</b>		
4 5 7	<i>Juncus kraussii subsp. australiensis</i>	sea rush	
1 5 12 19	<i>Juncus pallidus</i>	pale rush	
	<b>LILIACEAE</b>		
9	<i>Agapanthus praecox subsp. orientalis</i>	agapanthus	i
10	<i>Asparagus asparagoides</i>	bridal creeper	d
11 12	<i>Burchardia umbellata</i>	milkmaids	
11	<i>Caesia parviflora</i>	pale grass-lily	
4 5	<i>Dianella brevicaulis</i>	shortstem flaxlily	
3 4 5 6 13 14 16	<i>Dianella revoluta</i>	spreading flaxlily	
13 16	<i>Thysanotus patersonii</i>	twining fringelily	
	<b>ORCHIDACEAE</b>		
4 5 13 16	<i>Acianthus pusillus</i>	small mosquito-orchid	
11	<i>Caladenia carnea</i>	pink fingers	
11	<i>Caladenia fuscata</i>	dusky fingers	
16	<i>Caladenia sp.</i>	spider-orchid	
16	<i>Chiloglottis sp.</i>	bird orchid	
16	<i>Diuris sp.</i>	golden moths	
11 13 16	<i>Glossodia major</i>	waxlip orchid	
16	<i>Pterostylis stenochila</i>	greenlip greenhood	
14	<i>Thelymitra nuda</i>	plain sun-orchid	

13	<i>Thelymitra rubra</i>	pink sun-orchid	
16	<i>Thelymitra sp.</i>	sun-orchid	
	<b>POACEAE</b>		
3 6 8	<i>Ammophila arenaria</i>	marram grass	i
4 5 13 16	<i>Austrodanthonia sp.</i>	wallabygrass	
5 13	<i>Austrostipa sp.</i>	speargrass	
4 5 7 19	<i>Austrostipa stipoides</i>	coast speargrass	
20			
4 5 13	<i>Briza maxima</i>	greater quaking-grass	i
1 5	<i>Bromus sp.</i>	brome	i
1 4 5 15	<i>Dactylis glomerata</i>	cocksfoot	i
4 5 7 19	<i>Distichlis distichophylla</i>	australian saltgrass	
1 5 12 13	<i>Ehrharta stipoides</i>	weeping grass	
16 20			
5 6 8	<i>Lagurus ovatus</i>	haretail grass	i
5	<i>Paspalum dilatatum</i>	paspalum	i
3 4 5 6 8	<i>Poa labillardierei</i>	silver tussockgrass	
13 16			
8	<i>Spinifex sericeus</i>	beach spinifex	
4 5 13	<i>Themeda triandra</i>	kangaroo grass	
	<b>RESTIONACEAE</b>		
7 19	<i>Apodasmia brownii</i>	coarse twinerush	
12	<i>Baloskion australe</i>	southern cordrush	
4 5 11 13	<i>Hypolaena fastigiata</i>	tassel roperush	
16 19			
2 11 12	<i>Leptocarpus tenax</i>	slender twinerush	
	<b>XANTHORRHOACEAE</b>		
1 2 3 4 5 6	<i>Lomandra longifolia</i>	sagg	
8 13 14			
16 17 19			
20			
12	<i>Xanthorrhoea arenaria</i>	sand grasstree	en VU
V			
11 12	<i>Xanthorrhoea australis</i>	southern grasstree	
	<b>PTERIDOPHYTA</b>		
	<b>DENNSTAEDTIACEAE</b>		
1 2 3 4 5 6	<i>Pteridium esculentum</i>	bracken	
8 13 16			
17 19 20			
	<b>DICKSONIACEAE</b>		
1	<i>Dicksonia antarctica</i>	soft treefern	
	<b>GLEICHENIACEAE</b>		
1	<i>Gleichenia dicarpa</i>	pouched coralfern	
2	<i>Gleichenia microphylla</i>	scrambling coralfern	
	<b>LINDSAEACEAE</b>		
11 12	<i>Lindsaea linearis</i>	screw fern	
	<b>LYCOPODIACEAE</b>		
11	<i>Lycopodium deuterodensum</i>	conifer clubmoss	
	<b>SELAGINELLACEAE</b>		
12	<i>Selaginella uliginosa</i>	swamp spikemoss	

### APPENDIX 3A – REVIEW OF THREATENED FLORA

The following details threatened flora species, from the Natural Values Report, that have previously been recorded with a 5 km radius. It also provides an assessment of the likely occurrence of each within the study area.

Species	Status TSPA/ EPBCA	Potential to Occur	Observations and Preferred Habitat <sup>10</sup>
<b>Known from within 500 m</b>			
<i>Acacia ulicifolia</i> juniper wattle	Rare / -	MODERATE	Many previous observations include very recent ones. Occurs in sandy coastal heaths and open forests and woodlands. Suitable habitat is present, notably in the Unnamed Reserve, but unlikely to have been overlooked unless it occurs in very low number.
<i>Austrodanthonia induta</i> tall wallaby grass	Rare / -	LOW	One previous observation is from 2003. Occurs in dry grassy habitat, typically on mudstone or dolerite. None of the Reserves provide core habitat for this species.
<i>Brachyloma depressum</i> spreading heath	Rare / -	<b>Present</b>	Several previous observations in the vicinity. Occurs in shrubby heathland amongst granite boulder/sheets or on granite soils. Present in the Rita & Doris and Harold St Reserves.
<i>Caladenia filamentosa</i> daddy-long legs	Rare / -	MODERATE	Four previous observations are from the 1970s and 1980s. Uncommon and very localised in distribution. It is known from heathy and sedgy open eucalypt forest and woodland on sandy soils. Suitable habitat is present, notably in the Unnamed Reserve. Further targeted searches during the flowering season in October and November may reveal its presence.
<i>Caustis pentandra</i> thick twistsedge	Rare / -	<b>Present</b>	Many previous observations in the vicinity. Known from sandy soils in coastal heathland and heathy woodland. Present in the Unnamed Reserve.
<i>Conospermum hookeri</i> tasmanian smokebush	Vulnerable / VULNERABLE	<b>Present</b>	Many previous observations in the vicinity. Occurs in open coastal heathland and heathy woodland on granite or sandy acid, low nutrient soils. Present in the Unnamed Reserve.
<i>Corunastylis firthii</i> firths midge-orchid	Endangered / CRITICALLY ENDANGERED	LOW	Occurs on sandy soils. Known only from three locations: two at Coles Bay and one at Friendly Beaches but not from within the Reserves. Only one of these populations, at Coles Bay, may still be extant.
<i>Corunastylis morrisii</i> bearded midge-orchid	Endangered / -	MODERATE	Several previous observations are from between 1979 and 2008. Occurs in near-coastal lowland areas on moderately drained sites including heathland and sedgy open eucalypt woodland, grassland and buttongrass moorland. Suitable habitat is present, notably in the Unnamed and Rita & Doris Reserves. Further targeted searches during the flowering season from late January through to March may reveal its presence.

<sup>10</sup> Lazarus *et al.* 2003; Jones *et al.* 1999; Wapstra *et al.* 2008

Species	Status TSPA/EPBCA	Potential to Occur	Observations and Preferred Habitat <sup>10</sup>
<i>Corunastylis nuda</i> tiny midge-orchid	Rare / -	LOW	One previous observation is from 1960. Uncommon and localised in coastal and near-coastal areas. It occurs in moorland, sedgeland and heathland on moderately drained peaty soils and in damp mossy skeletal soils on granite slabs. Marginal habitat is present in the Unnamed and Rita & Doris Reserves.
<i>Cotula vulgaris</i> var. <i>australasica</i> slender buttons	Rare / -	LOW	One previous observation is from 2004. Occurs in scrub, herbfields, rocky outcrops and wet or brackish swamps. Very marginal habitat is present along the coast.
<i>Cynoglossum australe</i> coast houndstongue	Rare / -	LOW	Three previous observations are not recent. Occurs in grasslands, open forest, coastal dunes and other dry places. Possibly overlooked in the Coastal Reserve and/or The Fisheries if it occurs in very low numbers.
<i>Cyphanthera tasmanica</i> tasmanian rayflower	Rare / -	MODERATE	Several previous observations are from between 1981 and 1990. Confined to gullies and hillsides on Tasmania's east coast, often present after fire when it appears in large numbers and lives for about 10 years. May emerge following fire.
<i>Deyeuxia densa</i> heath bentgrass	Rare / -	LOW	Two previous observation are from 1982. Occurs in open to lightly shaded situations, heath, sedgeland and stream banks. Marginal habitat is present in the Unnamed Reserve and northern part of the Coastal Reserve.
<i>Epacris barbata</i> bearded heath	Endangered / ENDANGERED	MODERATE	Many previous observations in the area. Occurs only in the vicinity of the Freycinet Peninsula and Schouten Island in open heathland and sandy heaths on granite soils. Suitable habitat is present in the Unnamed Reserve. Possibly overlooked if it occurs in very low numbers or it may emerge at some time in the future.
<i>Euphrasia collina</i> subsp. <i>deflexifolia</i> eastern eyebright	Rare / -	MODERATE to HIGH	This short-lived perennial herb occurs in open woodland or heath. It generally requires open patches of ground created by fire or other disturbance but with high soil moisture. It is often found along road edges, tracks and depressions near the headwaters of creeks. Many previous observations include one in 1999 from the Unnamed Reserve although the error for this record is 50 m. This herb may have been overlooked during the survey or it is highly possible that it has died off. Further targeted searches during the peak flowering season in early spring may reveal its persistence in this reserve.
<i>Lepidosperma viscidum</i> sticky sword-sedge	Rare / -	LOW to MODERATE	Four previous observations are from 1984 and 1994. Occurs in coastal and near-coastal rocky sites in low, open <i>Allocasuarina</i> forest/open shrubland on dolerite or granite. Suitable habitat may be present in the Coastal Reserve and/or The Fisheries. Possibly overlooked if it occurs in very low numbers.

Species	Status TSPA/ EPBCA	Potential to Occur	Observations and Preferred Habitat <sup>10</sup>
<i>Orthoceras strictum</i> horned orchid	Rare / -	LOW to MODERATE	A few previous observations are from between 1979 and 1992. Uncommon and localised in coastal and near-coastal areas. It occurs in moorland, sedgy and scrubby heathland, sedgy eucalypt shrubland and open forest on poorly to moderately drained peaty, sandy and clay soils that are at least seasonally moist. Sometimes it occurs in thin mossy soils at soaks on rock faces. Some small patches of suitable habitat may be present in the Unnamed and Rita & Doris Reserves. Further targeted searches during the flowering season in December and January may reveal its presence.
<i>Philotheca freyciana</i> freycinet waxflower	Endangered / ENDANGERED	LOW	Known only from The Hazards and Cape Tourville on the Freycinet Peninsula where it occurs on skeletal granite soils usually in cracks and crevices on granite slabs and boulders. Potential habitat is present in the Rita & Doris Reserve but unlikely to have been overlooked.
<i>Pimelea flava</i> subsp. <i>flava</i> yellow riceflower	Rare / -	LOW to MODERATE	Several previous observations include recent ones. Prefers moderately fertile sites including shrubby <i>E. amygdalina</i> damp forest with co-dominants of <i>E. obliqua</i> , <i>E. ovata</i> and <i>E. pulchella</i> , or shrubby <i>E. amygdalina</i> forest on dolerite in sub-coastal area. Marginal habitat is present in the Unnamed Reserve and DOW community in the Coastal Reserve. Possibly overlooked if present in very low numbers.
<i>Pomaderris intermedia</i> lemon dogwood	Rare / -	VERY LOW	Two previous observations are from 1983 and 2006. Occurs predominantly in wet sclerophyll forest and shrubland. No suitable habitat is present.
<i>Pterostylis grandiflora</i> superb greenhood	Rare / -	MODERATE	Several previous observations include recent ones. Uncommon and localised especially in coastal areas. It occurs in heathy and shrubby open eucalypt forest and in grassy she-oak woodland on moderately to well drained sandy and loamy soils. Suitable habitat is present in the Coastal and Unnamed Reserves. Further targeted searches during the flowering season between April to August, peaking in June & July, may reveal its presence.
<i>Pterostylis squamata</i> ruddy greenhood	Rare / -	LOW to MODERATE	The most recent of several observations is 1992. Uncommon and localised in lowland heathy and grassy open eucalypt forest and heathland on well-drained sandy and loamy soils. Some suitable habitat is present in the Unnamed Reserve and possibly the Rita & Doris Reserve. Further targeted searches during the flowering season between December to March, peaking in January, may reveal its presence.
<i>Sporobolus virginicus</i> salt couch	Rare / -	LOW	The most recent of four observations is 1892. Occurs in salt marshes and on sand hills. Little suitable habitat is present and unlikely to have been overlooked.
<i>Spyridium vexilliferum</i> var. <i>vexilliferum</i> helicopter bush	Rare / -	Present	Many previous observations in the vicinity. Known from sandy heaths and on rocky outcrops. Present in the Coastal, Rita & Doris and Harold St Reserves

Species	Status TSPA/ EPBCA	Potential to Occur	Observations and Preferred Habitat <sup>10</sup>
<i>Stenanthemum pimeleoides</i> propeller plant	Vulnerable / VULNERABLE	MODERATE	The most recent of several observations is 2004. Occurs on dry, stony soils on siliceous, sandy gravels usually in heathy <i>E. amygdalina</i> or <i>E. pulchella</i> forest and usually where grasses and herbs are absent. It is highly palatable to stock and native herbivores. Suitable habitat may include the road reserve at The Fisheries. May have been overlooked particularly if it occurs in very low numbers.
<i>Thelymitra antennifera</i> rabbit ears	Endangered / -	LOW to MODERATE	Two previous observations in 1979 and 1992 are from the same location. Occurs in coastal heathland on poorly to moderately drained peaty and sandy soils, sometimes in mossy skeletal soils on granite bedrock. Suitable habitat may be present in the Unnamed Reserve. Further targeted searches during the peak flowering season from late September to early October may reveal its presence.
<i>Thelymitra atronitida</i> blackhood sun-orchid	Endangered / -	LOW to MODERATE	Two previous observations are from 2004. Occurs in coastal and lowland heathland and sedgeland, and heathy open eucalypt woodland on well drained sandy loams. Suitable habitat may be present in the Unnamed Reserve. Further targeted searches during the peak flowering season in early November may reveal its presence.
<i>Thelymitra holmseii</i> bluestar sun-orchid	Rare / -	LOW	One previous observations is from 2004. Known from heathland and heathy open forest on clay soils with poor to moderate drainage, often in swamp margins. Suitable habitat may be present in the DOW community in the Coastal Reserve. Further targeted searches during the peak flowering season in November may reveal its presence.
<i>Thelymitra malvina</i> mauve tuft sun-orchid	Endangered / -	VERY HIGH	Known from coastal heath and sedgelands on sandy loams or clay loams. Many previous observations include 4 from the Unnamed Reserve. Further targeted searches during the flowering season in October to November, peaking in early November, may reveal its persistence in the reserve.
<i>Thryptomene micrantha</i> ribbed heathmyrtle	Vulnerable / -	<b>Present</b>	Many previous observations in the vicinity. Occurs in dry sclerophyll forest mainly on the central east coast. Present at The Fisheries.
<i>Tricostularia pauciflora</i> needle bogsedge	Rare / -	LOW	The most recent of five previous observations is 2004. Occurs in sandy heaths, dunes and heath on clay soils around coastal areas. Some marginal habitat may be present in the Coastal and Unnamed Reserves.
<i>Xanthorrhoea arenaria</i> sand grasstree	Vulnerable / VULNERABLE	<b>Present</b>	Several previous observations in the vicinity. Occurs in coastal sandy heath. Present in the Unnamed Reserve.
<i>Xerochrysum palustre</i> swamp everlasting	- / VULNERABLE	VERY LOW	One previous observation is from 2005. Grows in swamps or winter-wet grasslands and swampy riparian vegetation. Very marginal habitat is present in the DOV community in the Coastal Reserve.
<i>Zieria littoralis</i> downy zieria	Rare / -	<b>Present</b>	Several previous observations in the vicinity. Occurs in rocky habitats on, or close to, the coast. Present in the Rita & Doris Reserve.



Species	Status TSPA/EPBCA	Potential to Occur	Observations and Preferred Habitat <sup>10</sup>
<b>Known from within 5 km</b>			
<i>Baumea articulata</i> jointed twigsedge	Rare / -	VERY LOW	One previous observation is from 1980. A perennial rush that occurs along rivers. Very marginal habitat is present in the DOV community in the Coastal Reserve.
<i>Bertya tasmanica</i> subsp. <i>tasmanica</i> tasmanian bertya	Endangered / ENDANGERED	VERY LOW	Two previous observations are from 2004. Occurs in wet sclerophyll forest along rivers and streams. No suitable habitat is present.
<i>Caladenia caudata</i> tailed spider-orchid	Vulnerable / VULNERABLE	LOW	The most recent of five previous observations is 1996. Widespread but localised in distribution. It occurs mainly in coastal sites in heathy and grassy open eucalypt woodlands often with she-oaks and in heathland on sandy and loamy soil. It is most often found on sunny north-facing slopes. Marginal habitat may be present in the Unnamed Reserve. Further targeted searches during the flowering season in late September to early November may reveal its presence.
<i>Gyrostemon thesioides</i> broom wheelfruit	Rare / -	LOW	One previous record is from 1982. Occurs predominantly in <i>Allocasuarina</i> forest. Suitable habitat is present in the Coastal Reserve and at The Fisheries but unlikely to have been overlooked.
<i>Lepidosperma forsythii</i> stout rapier sedge	Rare / -	LOW to MODERATE	Two previous observations are from 2004. Occurs in wet heath, sedgeland and near coastal areas. Suitable habitat may be present in the Coastal and Unnamed Reserves although unlikely to have been overlooked unless it occurs in low numbers.
<i>Lepidosperma tortuosum</i> twisting rapiersedge	Rare / -	LOW to MODERATE	The most recent of four previous observations is from 2004. Usually found in open heathland and eucalypt woodland from sea level to approximately 460 m. Suitable habitat may be present in the Unnamed and Rita & Doris Reserves although unlikely to have been overlooked unless it occurs in low numbers.
<i>Lobelia rhombifolia</i> tufted lobelia	Rare / -	LOW	Five previous observations are from between 1907 and 1981. Occurs in dry sclerophyll forest predominantly along the east coast. Suitable habitat may be present in the Coastal and Rita & Doris Reserve and The Fisheries. May have been overlooked if it occurs in low numbers.
<i>Melaleuca pustulata</i> warty paperbark	Rare / -	LOW	Five previous observations are from between 1983 and 2004. Occurs in dry open woodland, grassland and scrub, riparian zones and stable dunes in sparse coastal shrubbery. Habitat in the Reserves is very marginal and unlikely to have been overlooked.
<i>Polyscias</i> aff. <i>sambucifolia</i> fern panax	Endangered / -	LOW	One previous observation is from 2007. Known only from dolerite and granite slopes on the central east coast. Marginal habitat is present in the Rita & Doris Reserve but unlikely to have been overlooked.
<i>Pterosytis ziegelerei</i> grassland greenhood	Vulnerable / VULNERABLE	LOW	One previous observation is from 1992. In coastal areas it occurs on the slopes of low stabilised sand dunes and in grassy dune swales. Some habitat may be present in the DVC and SAC communities in the Coastal Reserve. Further targeted searches during the flowering season from September to December, peaking in October, may reveal its presence.

Species	Status TSPA/ EPBCA	Potential to Occur	Observations and Preferred Habitat <sup>10</sup>
<i>Ruppia megacarpa</i> largefruit seatassel	Rare / -	LOW	One previous observation is from 1991. Grows in coastal creeks, estuaries and lagoons. Marginal habitat is present in creeks in the Coastal Reserve and The Fisheries.
<i>Schoenus brevifolius</i> zigzag bogsedge	Rare / -	LOW	Four previous observations are from between 1987 and 2005. Grows in shallow water around the fringes of lagoons. Marginal habitat may be present at The Fisheries.
<i>Velleia paradoxa</i> spur velleia	Vulnerable / -	VERY LOW	One previous observation is from 1932. Occurs predominantly in grassland and grassy woodland. No suitable habitat is present.
<i>Zieria veronicea</i> subsp. <i>veronicea</i> pink zieria	Endangered / -	VERY LOW	Two previous observations are from 1945. Currently only known from the far north-east coast. Historic records are from Rocky Cape, Georges Bay, St Helens and Scamander.

### APPENDIX 3B – REVIEW OF THREATENED FAUNA

The following details threatened fauna species, from the Natural Values Report, that have previously been recorded, or could potentially occur, with a 5 km radius. It also provides an assessment of the likely occurrence of each within the study area.

Species	Status TSPA/EPBCA	Potential to occur	Observations and Preferred Habitat <sup>11</sup>
<b>MAMMALS</b>			
Tasmanian devil <i>Sarcophilus harrisii</i>	Endangered / ENDANGERED	Nesting: LOW Foraging: HIGH	Inhabits forest, woodland and agricultural areas. They are nocturnal hunters and scavengers. During the day they shelter in caves, old burrows and thick scrub. Devil facial tumour disease is the main threat to this species. However, the protection of maternal dens to ensure successful breeding is important to assist recovery. There has been some recent sightings of devils in the area but while it may forage and seek shelter in the some of the Reserves, no potential dens sites were observed during the survey.
New holland mouse <i>Pseudomys novaehollandiae</i>	Endangered / -	HIGH	Previous survey effort has been low and habitat may be broader than described. Core habitat is coastal dry heath on a sandy substrate with a dense and floristically diverse understorey. The Unnamed Reserve, contiguous with other similar vegetation may provide some potential habitat for this species.
Spotted-tailed quoll <i>Dasyurus maculatus maculatus</i>	Rare / VULNERABLE	HIGH	This naturally rare forest-dweller most commonly inhabits wet forest but also occurs in dry forest. It forages and hunts on farmland and pasture, travelling up to 20 km at night, and shelters in logs, rocks or thick vegetation. There have been several sightings of the quoll in the vicinity. Whilst the Reserves generally do not provide core habitat for this species they may provide some foraging and shelter habitat.
Thylacine <i>Thylacinus cynocephalus</i>	Extinct / EXTINCT	NONE	Now presumed extinct, the preferred hunting habitat of the thylacine was open grassland, scrub and dry sclerophyll woodland and it slept in well concealed dens and lairs.
<b>BIRDS</b>			
Wedge-tailed eagle <i>Aquila audax fleayi</i>	Endangered / ENDANGERED	Nesting: NONE Foraging: HIGH	Requires large old growth trees in sheltered areas for nesting and is highly sensitive to disturbance during the breeding season. There are no known nests within 5 km and no suitable nesting habitat is present in the Reserves although it may forage in the vicinity.
White-bellied sea-eagle <i>Haliaeetus leucogaster</i>	Vulnerable / -	Nesting: NONE Foraging: HIGH	Similar habitat requirement to the wedge-tailed eagle but this is primarily a coastal species whose main foraging habitat is around open water. Known nests are present within 5 km and the waters along the coast provide suitable foraging habitat. It may also utilise trees in the Coastal Reserve for perching.
Masked owl <i>Tyto novaehollandiae castanops</i>	Endangered / -	Nesting: NONE Foraging: MODERATE	Requires large old-growth hollow-bearing trees for nesting. Core nesting range includes the east coast but on the other side of Great Oyster Bay. No suitable nesting trees occur in the Reserves although this owl may utilise the area for hunting on occasion.

<sup>11</sup> Bryant & Jackson 1999

Species	Status TSPA/EPBCA	Potential to occur	Observations and Preferred Habitat <sup>11</sup>
Grey goshawk <i>Accipiter novaehollandiae</i>	Endangered / -	Nesting: NONE  Foraging: LOW	Inhabits large tracts of wet forest. No suitable habitat is present in the Reserves or immediate vicinity. Juveniles or non-breeding adults may visit the area on occasion.
Swift parrot <i>Lathamus discolor</i>	Endangered / ENDANGERED	Nesting: EXTREMELY LOW  Foraging: HIGH	Requires tree hollows for nesting and feeds on the nectar of blue gum ( <i>E. globulus</i> ) and black gum ( <i>E. ovata</i> ) flowers. Blue and black gum trees in the Coastal Reserve provide ideal foraging habitat during migration to breeding areas and outside the breeding season. However, the Coles Bay area is not within their breeding range.
Forty-spotted pardalote <i>Pardalotus quadragintus</i>	Endangered / ENDANGERED	Nesting: EXTREMELY LOW  Foraging: LOW	Occurs in coastal white gum ( <i>Eucalyptus viminalis</i> ) forest and woodland. The nearest known colonies in this part of the State are on Maria Island. Outside the breeding season when birds disperse from the breeding colonies they may utilise the white gums present in all the Reserves except the Unnamed Reserve.
Fairy tern <i>Sterna nereis nereis</i>	Vulnerable / -	Nesting: NONE  Foraging: LOW	Preferred breeding habitat includes sand or shingle beaches, dunes and estuaries. Beach nests are exposed scrapes on the ground. No suitable nesting habitat was observed in the two Reserves adjoining the beach although it may periodically forage along the coast.
<b>REPTILES</b>			
Glossy grass skink <i>Pseudomys novaehollandiae</i>	Rare / -	LOW to MODERATE	A secretive and poorly known species that inhabits low dense vegetation in moist areas such as swamps and margins of watercourses. It is threatened by habitat destruction especially from sheep and cattle during drought. In Tasmania it has been found most commonly around Launceston although one recent sighting is from Picnic Island in Great Oyster Bay. Some potential habitat is present along the creeks in the Coastal Reserve and at The Fisheries.
<b>AMPHIBIANS</b>			
Green and gold frog <i>Litoria raniformis</i>	Vulnerable / VULNERABLE	NONE	Occurs in heavily vegetated wetlands and require permanent freshwater for breeding. No suitable habitat is present in the Reserves.
<b>INVERTEBRATES</b>			
Chaostola skipper <i>Antipodia chaostola</i>	Endangered / -	LOW	This species appears to be very uncommon and localised in its distribution. It is thought to prefer dry open eucalypt forest containing <i>Gahnia radula</i> or <i>G. microstachya</i> which are the larval food plants within which they construct shelters. Two sightings from 2003 are in the National Park close to The Fisheries. However, although the DAC community near the beach may provide the habitat structure required by the skipper, these species of <i>Gahnia</i> were not recorded in the area.

Species	Status TSPA/EPBCA	Potential to occur	Observations and Preferred Habitat <sup>11</sup>
<b>FISH</b>			
Swan galaxias <i>Galaxias fontanus</i>	Endangered / ENDANGERED	VERY LOW	Inhabits slow to moderately fast-flowing freshwater, rocky streams with shelter both within-stream and from stream-side vegetation. The creeks present in the Coastal Reserve and at The Fisheries provide only extremely marginal habitat.

## **APPENDIX 4A – LEGISLATIVE OBLIGATIONS RELEVANT TO NATURAL VALUES OF RESERVES**

### **Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBCA)**

Flora species occurring in the Reserves that are listed under the EPBCA include *Conospermum hookeri* and *Xanthorrhoea arenaria*.

Fauna species potentially occurring in the Reserves that are listed under the EPBCA include the Tasmanian devil, spotted-tailed quoll and swift parrot.

Referral under the EPBC Act is necessary if any management activity within the Reserves are likely to have a significant impact on listed threatened species. In this regard the Act states:

‘An action has, will have, or is likely to have a significant impact on a critically endangered, endangered or vulnerable species if it does, will or is likely to (amongst other things):

- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or
- adversely affect habitat critical to the survival of a species.’

### **Tasmanian Threatened Species Protection Act 1995 (TSPA)**

Flora species occurring in the Reserves that are listed under the TSPA include *Brachyloma depressum*, *Caustis pentandra*, *Conospermum hookeri*, *Spyridium vexilliferum* var. *vexilliferum*, *Thryptomene micrantha*, *Xanthorrhoea arenaria* and *Zieria littoralis*.

Fauna species potentially occurring in the Reserves that are listed under the TSPA include the new-holland mouse, Tasmanian devil, spotted-tailed quoll, white-bellied sea-eagle and swift parrot.

Any management activities in the Reserves that will impact on these species would require a permit application to be submitted to the Development and Conservation Assessment Branch (DCAB) of DPIPWE with regard to the populations affected.

### **Tasmanian Forest Practices Regulations 2005**

The Forest Practices Regulations<sup>12</sup> require a Forest Practices Plan (FPP) where clearing of forest is in excess of 1 hectare or 100 tonnes of timber or involves ‘vulnerable land’ where the thresholds become less.

Under the terms of the Forest Practices Regulations, any native vegetation which has the potential to develop to a height exceeding 5 m is considered ‘forest’. ‘Vulnerable’ land includes land supporting threatened vegetation communities or species listed as threatened under the TSPA and/or the EPBCA. The threatened communities occurring in the Reserves include DOV, DOW, DVC, DGL and NCR. Threatened species are listed above under the EPBCA and TSPA headings.

Any clearing activities on ‘vulnerable land’ will require an FPP, irrespective of the volume of timber or area of vegetation involved (unless the clearing or harvesting is necessary to protect public safety or to maintain existing infrastructure and it involves less than 1 ha or 5 tonnes of timber).

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<sup>12</sup> Tasmanian State Government 2005.



**Tasmanian Weed Management Act 1999 (WMA)**

The following table summarises the status within the Glamorgan Spring Bay municipality of ‘declared weeds’ present in the Reserves according to relevant Weed Management Plans prepared under the Act.

<b>Weed</b>	<b>Status in the GSB municipality</b>	<b>Municipal classification</b>
Bridal creeper ( <i>Asparagus asparagoides</i> )	Localised infestation	A
Montpellier broom ( <i>Genista monspessulana</i> )	Localised infestation	A
Blackberry ( <i>Rubus fruticosus</i> agg.)	Widespread	B

According to the provisions of the WMA Zone A municipalities are those that host infestations of a ‘declared weed’ that are currently deemed eradicable. Achieving and maintaining a total absence of the weed from within the municipal boundaries is the ultimate management outcome.

Zone B municipalities are those that host infestations of the ‘declared weed’ that are not deemed eradicable because the feasibility of effective management is low at this time. Therefore, the objective is containment of infestations. The objective includes preventing spread of the ‘declared weed’ from the municipality and preventing spread to properties currently free of them. There is a requirement to prevent spread of the ‘declared weeds’ to properties containing sites for significant flora, fauna and vegetation communities such as those present here.

## **APPENDIX 4B – OTHER LEGISLATION AND POLICIES RELEVANT TO RESERVE MANAGEMENT**

### Strategic policies

Glamorgan Spring Bay Planning Scheme

State Coastal Policy

Tasmanian Reserve Management Code of Practice 2003

### Legislation

*Aboriginal Relics Act 1975*

*Cat Management Act 2009*

*Crown Lands Acts 1976*

*Environmental Management and Pollution Control Act 1994*

*Historical Cultural Heritage Act 1995*

*Land Use Planning and Approvals Act 1993*

*Local Government Act 1993*

*National Parks and Reserves Management Act 2002*

*Nature Conservation Act 2002*

**APPENDIX 5A – DECLARED WEED PHOTOS**



**Blackberry (*Rubus fruticosus*)**



**Bridal creeper (*Asparagus asparagoides*)**



**Montpellier broom (*Genista monspessulana*)**



**APPENDIX 5B – ENVIRONMENTAL WEED PHOTOS**



**Agapanthus (*Agapanthus praecox*)**



**Banana passionfruit (*Passiflora tarminiana*)**



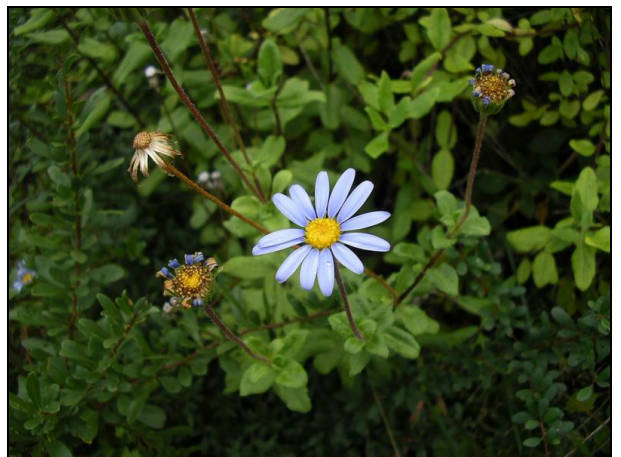
**Bears breeches (*Acanthus mollis*)**



**Blackberry nightshade (*Solanum nigrum*)**



**Blue butterfly bush (*Psoralea pinnata*)**



**Blue marguerite (*Felicia amelloides*)**





**Blue periwinkle (*Vinca major*)**



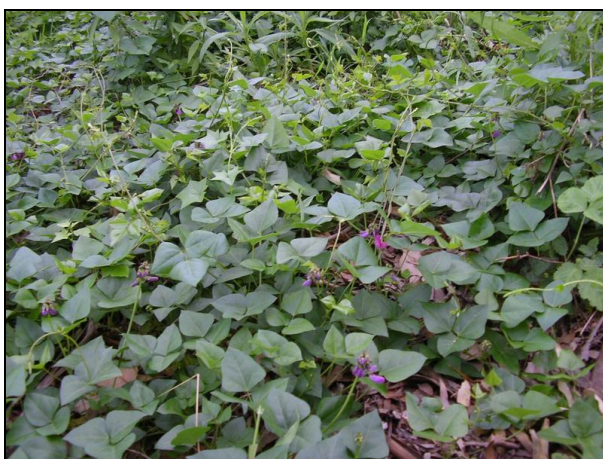
**Bluebell creeper (*Billardiera fusiformis*)**



**Cape ivy (*Delairea odorata*)**



**Cootamundra wattle (*Acacia baileyana*)**



**Dolichos pea (*Dipogon lignosus*)**



**Grevillea hybrid (*Grevillea* sp.)**





**Gum (planted) (*Eucalyptus* sp.)**



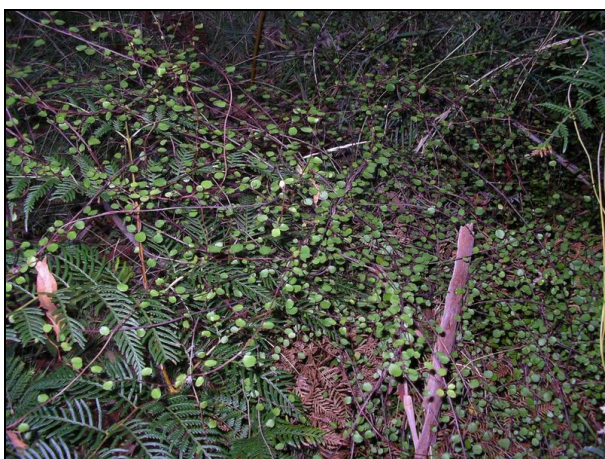
**Howitts wattle (*Acacia howittii*)**



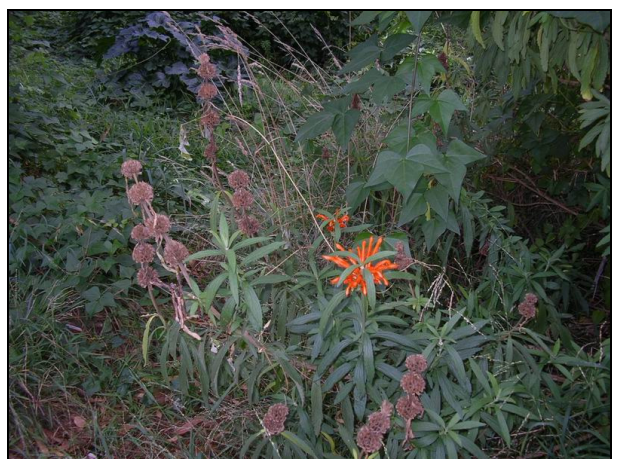
**Ivy (*Hedera helix*)**



**Japanese honeysuckle (*Lonicera japonica*)**



**Lignum (*Muehlenbeckia complexa*)**



**Lions ear (*Leonotis leonurus*)**





**Madeira broom (*Genista stenopetala*)**



**Milkwort (*Polygala myrtifolia*)**



**Mirrorbush (*Coprosma repens*)**



**Montbretia (*Crocsmia Xcrocsmiiflora*)**



**Nasturtium (*Tropaeolum major*)**



**Pincushion plant (*Hakea laurina*)**





**Red valerian (*Centranthus ruber*)**



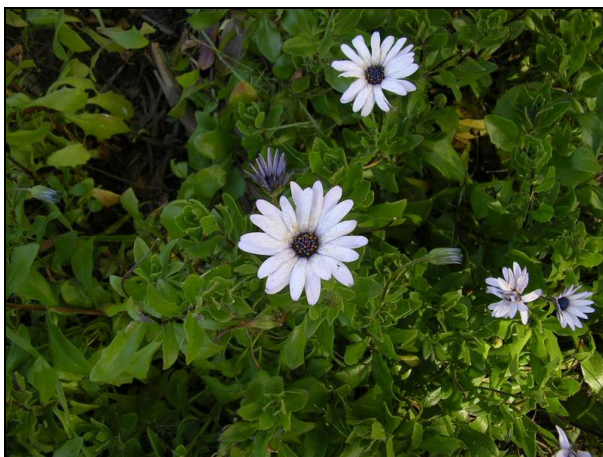
**Sea spurge (*Euphorbia paralias*)**



**Shade crassula (*Crassula multicava*)**



**Sweet pittosporum (*Pittosporum undulatum*)**



**Trailing daisy (*Osteospermum fruticosum*)**



**Tree lucerne (*Chamaecytisus palmensis*)**