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ECOSYSTEM SERVICES

Pitt Water - Orielton Lagoon Foreshore Strategic Action Plan

November 2011

For NRM South

Contents

Introduction

The Pitt Water-Orielton Lagoon area was listed as a Wetland of International Importance under the Ramsar Convention in 1982, committing Australia to maintaining its ecological character and planning for its 'wise' or sustainable use. It is a relatively large area which covers multiple tenures, and as such there are multiple land managers with responsibility for its care.

This document describes 15 'management units' into which the area may be divided. For each management unit there is a high-level description of its values, features and management issues. While not intended as a formal plan to be endorsed by local or state government agencies, it has enough information to enable land managers and other interested parties to identify areas of priority and to develop a more detailed action plan for maintaining or improving the health of the wetland as a whole.

This report was commissioned by NRM South and supported by the Australian Government's Caring for our Country program.

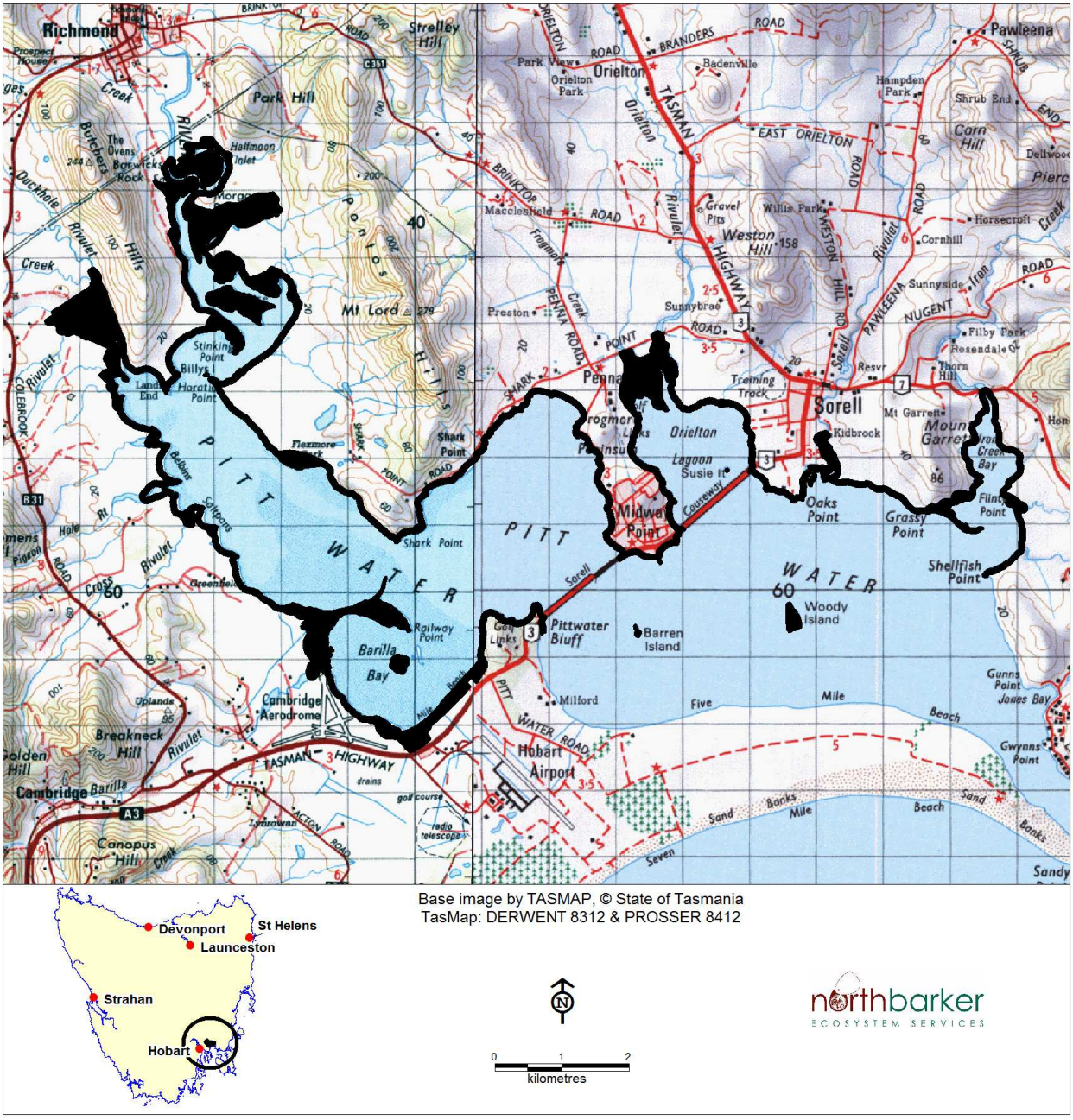


Figure 1 - Location of the Study Area

Explanatory Notes

Study Area

For the purposes of this action plan the study area incorporates all of the intertidal areas and saltmarsh and other coastal vegetation and extends for a minimum of 50 m from the high water mark. Where areas of quality vegetation occurred outside of the 50m mark, the study area has been extended to include these areas.

Management Units

The study area has been divided in to fifteen variable management units. The units have been chosen as logical conglomerations of either vegetation types, geographical units, management issues, obvious visual boundaries or a combination of the above.

Each unit includes a brief description of its geographical layout, a natural values assessment, followed by management issues and recommended actions. The natural values assessment includes information on vegetation communities, threatened flora and fauna, fauna habitat and weeds.

Field Survey

A brief field survey was carried out over four days between October 13th and October 21st 2011. This survey was intended to get an overview of the study area and a feel for the natural values and management issues of the area.

Vegetation Communities

Vegetation communities were re-mapped during the field survey. Within each unit a brief description of the dominant communities is given along with a comment on overall condition and a list of the vegetation communities recorded. If all or part of the vegetation within a unit is important because of its good condition, intactness, size, location or fauna habitat values, it is listed as a Priority Vegetation Area.

Vegetation communities listed as threatened under the Tasmanian *Nature Conservation Act 2002* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are documented.

Threatened Flora

Incidental records were recorded during the limited field survey, and these species are marked with an asterisk (*) within the text. Records from the Natural Values Atlas (DPIPWE) are also shown. Only records that actually fall within the boundary of the study area have been included (compared with threatened fauna below).

Threatened Fauna

Records from the Natural Values Atlas (DPIPWE) have been used to indicate possible use by threatened fauna species. Included records are those that fall within a 500m buffer of the high-water mark within each management unit.

Conservation Ratings

All threatened flora and fauna use the following rating abbreviations throughout this plan:

Flora and fauna listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA 1999)

- CR - critically endangered
- EN - endangered
- VU - vulnerable

Flora and fauna listed under the Tasmanian *Threatened Species Protection Act 1995* (TSPA 1995)

- e - endangered
- v - vulnerable
- r - rare

Threatened flora and fauna conservation ratings throughout this report are written like the following example:

- *Glycine latrobeana* (v/VU)

The first rating in brackets is the TSPA rating, the second being the EPBCA rating. This applies to all threatened flora and fauna species.

Fauna Habitat

A brief description of the quality and most likely areas to provide fauna habitat values has been included.

Weeds

A full and comprehensive weed survey was not carried out. However, an indication of the amount of weeds and a description of the infestation within a unit has been included. The study area has also been mapped as to the level of weed infestation. This assessment is subjective and the foreshore area has been rated as one of three levels - severe, moderate and minor. A list of the weeds recorded in each unit has been included.

Only weeds classified as Weeds of National Significance (WONS), declared (Tasmanian *Weed Management Act 1999*) or environmental (other known bush land weeds) have been included.

Management Issues and Recommended Actions

Actual and potential management issues were recorded during the field survey. Recommended actions to ameliorate these issues have been included. The following general issues were recorded throughout the study area:

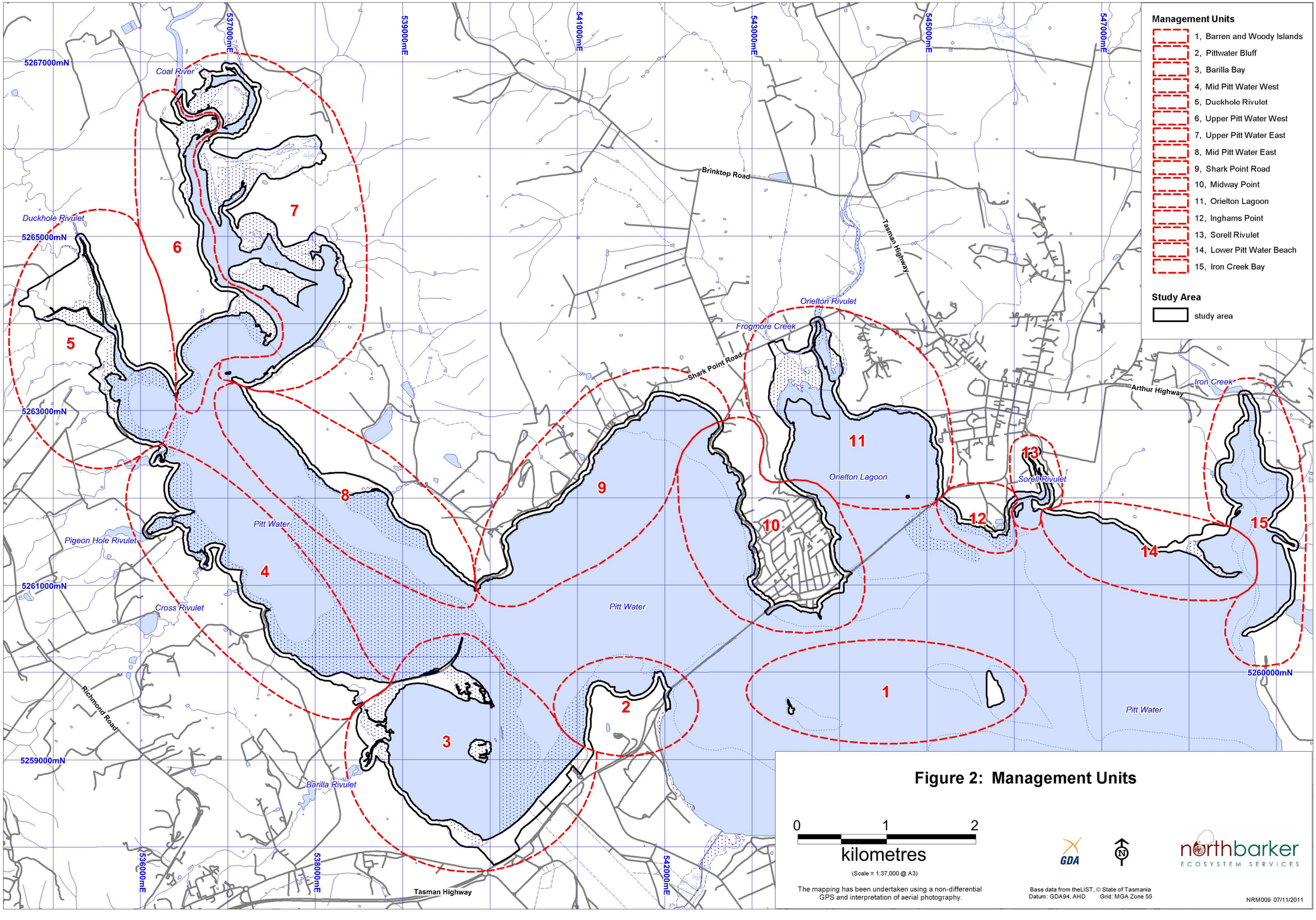
- Weed s
- Protection of native vegetation
- Sea bird habitat
- Vegetation survey
- Encroachment of industrial development

- Bank, soil and shoreline erosion
- Samphire dieback
- Rubbish dumping and removal
- Feral animals
- Acid sulphate soils
- Dispersive soils
- Fencing and stock control
- Revegetation
- Aboriginal heritage
- Boundary issues

Figures

The following figures are included in Appendix 1 in this action plan:

- Figure 3 - Vegetation Communities
- Figure 4 - Priority Vegetation Areas
- Figure 5 - Weeds
- Figure 6 - Acid Sulphate Soils
- Figure 7 - Erosion
- Figure 8 - Dispersive Soils
- Figure 9 - Sea Bird Habitat
- Figure 10 - Threatened Species


Management Units
1, Barren and Woody Islands
2, Pittwater Bluff
3, Barilla Bay
4, Mid Pitt Water West
5, Duckhole Rivulet
6, Upper Pitt Water West
7, Upper Pitt Water East
8, Mid Pitt Water East
9, Shark Point Road
10, Midway Point
11, Orielton Lagoon
12, Inghams Point
13, Sorell Rivulet
14, Lower Pitt Water Beach
15, Iron Creek Bay
Study Area
study area
537000mE
539000mE
541000mE
543000mE
545000mE
547000mE
5267000mN
5265000mN
5263000mN
5261000mN
5260000mN
5259000mN
536000mE
538000mE
542000mE
Coal River
Duckhole Rivulet
Pigeon Hole Rivulet
Cross Rivulet
Barilla Rivulet
Pitt Water
Orielton Lagoon
Orielton Rivulet
Frogmore Creek
Sorell Rivulet
Iron Creek
Brinktop Road
Shark Point Road
Tasman Highway
Arthur Highway
Richmond Road
Tasman Highway
Figure 2: Management Units
0
1
2
kilometres
(Scale = 1:37,000 @ A3)
The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.
GDA
Base data from theLIST, © State of Tasmania
Datum: GDA94, AHD
Grid: MGA Zone 55
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NRM009 07/11/2011

Management Unit 1 - Woody and Barren Islands

Description

This management unit consists of Woody Island and Barren Island which both occur in the Lower Pitt Water bay, south of the causeways. This unit contains approximately 1.5 kilometres of foreshore.

The land tenure for this entire unit is classified as nature reserve. Both islands are part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS). This unit was assessed by boat; the land was not accessed for a thorough survey, particularly for threatened flora species.

Natural Values Assessment	
Vegetation Description	Woody Island is dominated by *Eucalyptus viminalis* grassy forest, while Barren Island is dominated by Coastal heathland. Vegetation was not visited on the ground - a site visit would allow a proper assessment of vegetation communities and could alter the vegetation communities as currently assessed.
Vegetation Communities	• *Eucalyptus viminalis* grassy forest (DVG) • Coastal heathland (SCH)
Vegetation Condition	The condition of the vegetation on Woody Island appeared to be good, with the vegetation appearing structurally and floristically intact. An ongoing weed control program appears to be working. The condition of the vegetation on Barren Island is in a poor condition with a large infestation of African boxthorn present.
Priority Vegetation Area	The vegetation within this unit is recommended to be included as a Priority Vegetation Area because of its good condition, intactness and fauna habitat values.
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	No threatened flora species were recorded from within this unit.
Threatened Fauna (NVA Records)	• white-bellied sea-eagle (v/-) (EPBCA - listed as marine/migratory)
Fauna Habitat	Woody Island is considered to be important habitat for the white-bellied sea-eagle, with at least one adult bird still roosting on the island. A large nest is still present. Barren Island is important habitat for sea birds, with an abundance of birds being seen roosting and nesting on the

	island during the field survey for this project. The bay to the south and west of Barren Island has been identified as an important feeding area for several bird species (pers comm. E. Woehler, October 2011). Due to their isolation from the mainland and their small size, they are unlikely to offer habitat for any other threatened species, with their main habitat value being as bird habitat.
Weeds	• African boxthorn • radiata pine • boneseed
Weed Description and Comments	Woody Island appeared to contain few weeds, which is as a result of an ongoing weed control program being coordinated jointly by the Southern Tasmanian Councils Authority (STCA) and the Tasmanian Parks and Wildlife Service (PWS). The plan is for this program to continue on an annual basis. It will be scheduled to occur in mid-summer to avoid disturbing the white-bellied sea-eagle population during their breeding season (pers comm. S. Leighton, October 2011). This program has so far focused on the primary control of boneseed and radiata pine, and currently only seedlings of these species remain. African boxthorn also occurs on the island but has not yet been controlled. This species is unlikely to be targeted as a part of the ongoing program, and so a contractor is likely to be needed to do this (pers comm. S. Leighton, October 2011). Barren Island has a major infestation of African boxthorn, which appeared to be the dominant species on the island. Weed control is not currently occurring on this island.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- A continuation of the weed control program on Woody Island is a high priority. This program is planned to continue on an annual basis (pers comm. S. Leighton, October 2011), and it should be supported where possible.
- As control of African boxthorn has not yet been carried out, a weed control contractor should be sought to target this species. Initial control of the weeds listed above is estimated at 2 days work for a team of 4 bushcare workers. This estimate has been made without an on-ground site visit, so may be inaccurate. Follow up work is not included in this estimate but is essential.
- Weed control on Barren Island is more complex. Control of African boxthorn raises several issues including sea bird habitat loss and potential promotion of wind erosion. Any control would have to occur outside of the sea bird nesting season (October to March, inclusive). Control would need to be spread out over several years and staged in conjunction with revegetation so that habitat is replaced and soils are not over exposed to erosion factors.
- Initial control of the African boxthorn is estimated at 3 days work for a team of 4 bushcare workers. However these 4 days would need to be spread out

over 4 or 5 years to minimise the risks described above. A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.

- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program should be done in collaboration with the team undertaking the weed control on Woody Island.
- See map for location and level of weed infestations.

2. Protection of sea bird habitat and native vegetation

- The vegetation within this unit is in good condition and provides important sea bird habitat; Woody Island for the white-bellied sea-eagle, and Barren Island for sea birds.
- Maintaining the condition and extent of native vegetation in this unit should be seen as a priority.
- Implementing weed control (as described above) should protect the habitat for these species.

Management Unit 2 - Pittwater Bluff

Description

This management unit contains the section of land known as Pittwater Bluff. It extends from the start of the study area on the eastern side of the Bluff, around to where the cliffs finish on the western side of the bluff. This unit contains approximately 2.5 kilometres of foreshore.

The land tenure for this entire unit is private property, with almost the entire unit being owned by the Tasmania Golf Club. This unit was assessed from the shoreline which did not allow for a thorough inspection of the area for threatened flora species.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by native woodlands of *Allocasuarina verticillata* forest and *Eucalyptus viminalis - Euc. globulus* coastal forest.
Vegetation Communities	• *Eucalyptus viminalis - Euc. globulus* coastal forest (DVC) • *Allocasuarina verticillata* forest (NAV) • Extra urban miscellaneous (FUM)
Vegetation Condition	The condition of the vegetation is generally very good, with the vegetation structurally and floristically intact for the entire unit. Weed problems may threaten this in the future (see below).
Priority Vegetation Area	The vegetation within this unit is recommended to be included as a Priority Vegetation Area because of its good condition, intactness and fauna habitat values.
Threatened Vegetation Communities	*Eucalyptus viminalis - Euc. globulus* coastal forest is listed as a threatened vegetation community under the Tasmanian *Nature Conservation Act 2002*. No communities are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
Threatened Flora (NVA records & current survey*)	• *Caladenia caudata* (v/VU) • *Ranunculus sessiliflorus* var. *sessiliflorus* (r/-)
Threatened Fauna (NVA Records)	• eastern barred bandicoot (-/VU)
Fauna Habitat	Birds Tasmania have indicated that the Milford/ Five Mile Beach area, to the east of this unit, and Barilla Bay, to the west of this unit, are both important feeding and roosting areas for migratory and resident shore and sea birds (pers comm. E. Woehler, October 2011). Significant species known to use this area for feeding and roosting include the eastern curlew, bar-tailed godwit, red-necked stint and the double-banded plover. The pied oyster catcher also uses the area east of the Bluff for nesting.

	The majority of the habitat values actually within this unit come from the native woodlands. These woodlands are in good condition and are large enough to provide good habitat for a variety of native species. Threatened species previously recorded that may use these habitats include the eastern barred bandicoot.
Weeds	• African boxthorn • coastal tea-tree • gazania • radiata pine • trailing African daisy
Weed Description and Comments	African boxthorn is the most common weed in this unit, with the morthern and eastern shorelines suffering a moderate infestation level. Gazania, trailing African daisy and radiata pine are in very low numbers only, and present a good opportunity for eradication while still in low numbers. Coastal tea-tree has escaped from golf course plantings, and is spreading.

Management Issues and Recommended Actions

1. Weed control

- Due to the quality of the vegetation in this unit, weed control is seen as a high priority.
- Initial control of the weeds listed above is estimated at 10 days work for a team of 4 bushcare workers. Follow up work is not included in this estimate but is essential. This estimate does not include the removal of African boxthorn plants that occur in dangerous locations on the tall cliffs of this unit. It only includes those plants that can be safely accessed.
- A detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan would include the removal of those difficult to access weeds occurring in dangerous places on the cliffs.
- Any weed control program will need to be carried out in collaboration with private landholders.
- Weed control in this area should not pose a threat to soil stability or exacerbate erosion problems.
- See map for location and level of weed infestations.

2. Protection of native vegetation

- The vegetation within this unit is in good condition and provides valuable habitat for flora and fauna species. Maintaining the condition and extent of native vegetation in this unit should be seen as a priority.
- All of the vegetation within this unit is private property, so collaboration and relationship development with landholders will be crucial.

3. Sea bird habitat

- Protection of native vegetation areas and limitation of further development are recommended to reduce disturbance to sea bird populations.

4. Vegetation survey

- A vegetation survey that compiles a complete species list for this unit is recommended. Particular attention should be paid to searching for the nationally listed *Caladenia caudata* which has been previously recorded on site. Adjacent properties are known to contain important populations of other nationally listed orchid species, which could occur in this unit and should also be surveyed for. Permission should be sought to extend this survey over the entire golf course area which appears to contain significant remnants of vegetation.

Management Unit 3 - Barilla Bay

Description

This management unit contains the majority of the Barilla Bay area. It extends from Railway Point in the north encompassing all of the samphire type vegetation around the bay to where the beach ends and the cliffs start at the Tasmania Golf Club. It includes the unnamed island in the middle of the bay. This unit contains approximately 12 kilometres of foreshore.

The land tenure for the vast majority of this unit is private property, with the exception of the thin strip of land at Railway Point and another small section near the Barilla Bay oyster farm land. The western half of Barilla Bay (to the high water mark) is part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Servise (PWS). A large section of this unit on the northern and eastern side of Barilla Bay, comprised mainly of succulent saline herbland, is currently protected under a Conservation Covenant.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by Succulent saline herbland around most of the bay. On the south-western shore a significant section is dominated by a mosaic of native woodlands including *Allocasuarina verticillata* forest, Bursaria - Acacia woodland and scrub and *Eucalyptus ovata* woodland. The south-eastern shore is dominated by *Eucalyptus viminalis - Euc. globulus* coastal forest.
Vegetation Communities	• lacustrine herbland (AHL) • Saline sedgeland/rushland (ARS) • Succulent saline herbland (ASS) • *Eucalyptus ovata* woodland (DOV) • *Eucalyptus viminalis - Euc. globulus* coastal forest (DVC) • Agricultural land (FAG) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA) • Sand, mud (OSM)
Vegetation Condition	The condition of the vegetation is generally good, with the vegetation structurally and floristically intact for nearly the entire unit. Apart from a few small weedy patches (see below), the area is predominantly free of environmental and declared weeds. An area of samphire die-back (see below) is of concern.
Priority Vegetation Area	The vegetation within this unit is recommended to be included as a Priority Vegetation Area because of its good condition, large cumulative area, intactness and fauna habitat values.
Threatened	Both lacustrine herbland and *Eucalyptus viminalis - Euc.*

Vegetation Communities	*globulus* coastal forest are listed as threatened vegetation communities under the Tasmanian *Nature Conservation Act 2002*. No communities are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
Threatened Flora (NVA records & current survey*)	• *Calocephalus citreus** (r/-) • *Cynoglossum australe* (r/-) • *Limonium australe* (r/-) • *Wilsonia humilis** (r/-) • *Wilsonia rotundifolia** (r/-)
Threatened Fauna (NVA Records)	• fairy tern (v/VU) • chequered blue (r/-) • masked owl (tasmanian) (e/VU) • eastern barred bandicoot (-/VU) • tussock skink (v/-)
Fauna Habitat	Birds Tasmania have indicated that Barilla Bay is one of the most important areas in the PWOL ramsar site for migratory and resident shore and sea birds (pers comm. E. Woehler, October 2011). A majority of the area within the bay is considered to be important for feeding and/or roosting for several bird species. Habitat used by these species focuses on the Saline sedgeland/rushland and the Succulent saline herbland, and also the shallow tidal areas and flats exposed at low tide. Significant species known to use this area for feeding include the eastern curlew, double-banded plover, red necked stint and the pied oyster catcher (recorded during current field survey). The double-banded plover and the pied oyster catcher also use the area for roosting. Threatened species previously recorded that may also use these habitats include the fairy tern and the chequered blue (butterfly). Habitat values outside of the saline flats consist of the woodland areas as described earlier. These areas, whilst narrow from previous clearance, are in good condition and are large enough to provide good habitat for a variety of native species. Threatened species previously recorded that may use these habitats include the eastern barred bandicoot.
Weeds	• African boxthorn • briar rose • hottentot fig • radiata pine
Weed Description and Comments	African boxthorn and briar rose are the more common weeds in this unit, however relative to the rest of the PWOL area, the infestations are minor. Hottentot fig and radiata pine are in very low numbers only, and present a good opportunity for eradication while still in low numbers.

Management Issues and Recommended Actions

1. Weed control

- Due to the relatively low numbers (see description above) of weeds and the quality of the vegetation in this unit, weed control is seen as a high priority.
- Initial control of the weeds listed above is estimated at 5 days work for a team of 4 bushcare workers. Follow up work is not included in this estimate but is essential.
- A detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing.
- Any weed control program should be done in collaboration with the Clarence Council (CC) and PWS.
- Weed control in this area should not pose a threat to soil stability or exacerbate erosion problems.
- See map for location and level of weed infestations.

2. Encroachment of industrial development

- Industrial development has seen the removal and or degradation of native vegetation particularly in the south-western part of this unit. No further encroachment of industrial development into native vegetation should be allowed to occur.

3. Protection of native vegetation

- The vegetation within this unit is in good condition and provides valuable habitat for flora and fauna species. Maintaining the condition and extent of native vegetation in this unit should be seen as a priority.
- The majority of the vegetation within this unit is private property, so collaboration and relationship development with landholders will be crucial.

4. Sea bird habitat

- Birds Tasmania have indicated that Barilla Bay is one of the most important areas in the PWOL ramsar site for migratory and resident shore and sea birds.
- Protection of native vegetation areas and limitation of further development are recommended to reduce disturbance to sea bird populations.

5. Bank erosion control

- Occurs particularly along the south-western shoreline in front of the section of native woodland. A gradual loss of native vegetation will continue to occur as the shoreline collapses, taking vegetation with it.
- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

6. Samphire dieback

- Dieback of samphire species, particularly *Sarcocornia quinqueflora* and *Tectcornia arbuscula* was recorded on the western section behind the Succulent saline herbland.
- Consultation with scientific authorities should be implemented to find out the reason for this dieback. Research could be facilitated to further understand this issue with the aim of implementing actions to reverse the problem.

7. Rubbish removal

- Is particularly prevalent along the south-western shoreline. A program to remove the rubbish would be of benefit to the amenity, water quality and habitat value of the area.
- Samphire flats in some people's opinion are of little value and can often attract rubbish dumping and disposal. Removing the currently present rubbish will keep the area looking more pristine and may discourage others from dumping rubbish here in the future.
- This site could be incorporated into the "Clean Up Australia Day" program.

8. Feral animals

- Several hares and rabbits were recorded adjacent to the aerodrome land and these are likely to be having a detrimental effect on native vegetation and soils in the unit.
- Where possible a regional control program should be implemented with the assistance of local landholders.

9. Acid sulphate soils

- Government data ((DPIPWE) indicates that the western shore and railway point area is a high risk area for acid sulphate soil development. This area coincides with the lower lying saline areas.
- Disturbance of soils and vegetation in these areas should not be allowed, as this is the highest risk factor in the development of acid sulphate soils.

Management Unit 4 - Mid Pitt Water West

Description

This management unit runs from the oyster farm near Railway Point in the south, along the foreshore to the Duckhole Rivulet bay area. This unit contains approximately 7.5 kilometres of foreshore. Over one third of this unit could not be visited on foot due to landholder restrictions.

The land tenure for the vast majority of this unit is private property, with the exception of several small strips of coastal crown land, which are isolated and surrounded by private property. The very northern section of this unit (to the high water mark) is part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS).

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by agricultural land, revegetation plantings, and areas of *Allocasuarina verticillata* forest and Bursaria - Acacia woodland and scrub of varying conditions. Some small patches of Succulent saline herbland and Saline sedgeland/rushland occur in some of the small bays that occur in this unit.
Vegetation Communities	• Saline sedgeland/rushland (ARS) • Succulent saline herbland (ASS) • Agricultural land (FAG) • Lowland grassland complex (GCL) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA) • Water, sea (OAQ)
Vegetation Condition	The condition of the vegetation in most of this section is generally poor, being dominated by agricultural land. There are small sections of the foreshore that contain *Allocasuarina verticillata* forest and Bursaria - Acacia woodland and scrub that is in a better condition, although weed control and bank erosion/collapse are degrading influences. The small bays containing Succulent saline herbland and Saline sedgeland/rushland are in a good condition.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Calocephalus citreus** (r/-) • *Wilsonia rotundifolia** (r/-) • *Vittadinia gracilis** (r/-)

Threatened Fauna (NVA Records)	No threatened fauna species were recorded from within this unit.
Fauna Habitat	Due to the degraded nature of the native vegetation within this unit, the habitat values are not considered to be high. This unit does not contain areas identified by Birds Tasmania as important roosting or feeding areas, although the use of this area by important species is not discounted.
Weeds	• African boxthorn • briar rose
Weed Description and Comments	African boxthorn and briar rose are the most common weeds in this unit, with the density of infestation varying from severe to moderate for most of the unit.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- Due to the relatively high numbers (see description above) of weeds, the poorer quality of the vegetation, and the lower habitat value, weed control is seen as a lower priority than in other areas of the study area.
- Weed control in this unit does not pose any major habitat loss issues, although soil stability and areas of erosion could be exacerbated if weed control is done too quickly. In areas of severe erosion, control would need to be spread out in stages over several years to minimise the potential impacts. Undertaking this in conjunction with revegetation so that habitat is replaced is recommended.
- Initial control of the weeds is estimated at 18 days work for a team of 4 bushcare workers. However these 18 days would need to be spread out over 4 or 5 years to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Bank erosion control

- Bank erosion is occurring along the cliffs and high energy banks of this unit, and it is particularly severe along the southern section of shoreline.
- A gradual loss of land and vegetation is occurring and will continue to occur as the shoreline collapses, taking vegetation with it. Previous revegetation areas are currently being eroded away.
- Old car tyres have been used to stop shoreline erosion along parts of the southern section of shoreline.

- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

3. Rubbish removal

- Along the southern section of shoreline car tyres have been used as tree guards and to prevent shoreline erosion. Many of the tree guards have been eroded into the sea and are currently scattered around this area.
- A program to remove the tyres would be of benefit to the amenity, water quality and habitat value of the area.

4. Feral animals

- Several hares were recorded adjacent to the aerodrome land and these are likely to be having a detrimental effect on native vegetation and soils in the unit.
- Where possible a regional control program should be implemented with the assistance of local landholders.

5. Acid sulphate soils

- Government data ((DPIPWE) indicates that parts of this unit are a high risk area for acid sulphate soil development. This area coincides with the lower lying saline areas.
- Disturbance of soils and vegetation in these areas should not be allowed, as this is the highest risk factor in the development of acid sulphate soils.

Management Unit 5 - Duckhole Rivulet

Description

This management unit encompasses the land from the start of the Duckhole Rivulet bay area on the western shore, following the shore around the Duckhole Rivulet to the other side of the bay area on its eastern shore ending at Lands End. This unit contains approximately 7.5 kilometres of foreshore.

The land tenure for the vast majority of this unit is private property. The aquatic section of this unit and a small section of adjacent land is part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS).

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by Succulent saline herbland, *Eucalyptus amygdalina* coastal forest and woodland and Bursaria - Acacia woodland and scrub. Some smaller sections of Lowland *Themeda triandra* grassland, *Eucalyptus viminalis* grassy forest and woodland and *Allocasuarina verticillata* forest also occur.
Vegetation Communities	• Succulent saline herbland (ASS) • *Eucalyptus amygdalina* coastal forest and woodland (DAC) • *Eucalyptus viminalis* grassy forest and woodland (DVG) • Agricultural land (FAG) • Lowland *Themeda triandra* grassland (GTL) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA)
Vegetation Condition	The condition of the vegetation is generally very good, particularly out of the Duckhole Rivulet bay area. Most of the vegetation in this area is structurally and floristically intact, apart from a few localised areas that are degraded by weeds, erosion or cattle damage. Adjacent to the Duckhole Rivulet bay area the vegetation condition declines considerably. The Succulent saline herbland areas are in a good condition.
Priority Vegetation Area	The vegetation within this unit is recommended to be included as a Priority Vegetation Area because of its good condition, intactness and fauna habitat values.
Threatened Vegetation Communities	Lowland *Themeda triandra* grassland is part of the complex known as Lowland Native Grasslands of Tasmania which is listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. It is only listed however when it meets certain condition criteria, which needs to be assessed by a qualified ecologist. Until this area is surveyed and assessed it can not be definitively determined whether

	this area is listed or not.
Threatened Flora (NVA records & current survey*)	• *Calocephalus citreus** (r/-) • *Carex tasmanica* (-/VU) • *Wilsonia humilis** (r/-) • *Wilsonia rotundifolia** (r/-) • *Vittadinia gracilis** (r/-) • *Vittadinia muelleri** (r/-)
Threatened Fauna (NVA Records)	No threatened fauna species were recorded from within this unit.
Fauna Habitat	The native woodlands and succulent saline herbland areas are in good condition and are large enough to provide good habitat for a variety of native species. The large size of the *Eucalyptus amygdalina* coastal forest and woodland patch (approx 30ha) in conjunction with the other habitats in the area, make this combined block of vegetation one of the more important habitat areas in the study area. This unit does not contain areas identified by Birds Tasmania as important roosting or feeding areas, although the use of this area by important species is not discounted.
Weeds	• African boxthorn • briar rose • gorse • hawthorn
Weed Description and Comments	Aside from several dense sections of weeds, the density of infestation for most of the unit was minor. African boxthorn is scattered throughout this unit, with a couple of severe infestations also present. Briar rose occurs in one main patch and hawthorn only occasional, also in one main area. Gorse occurs in seven dense patches along the eastern shoreline of this unit. Serrated tussock is a Weed of National Significance that has been recorded at two locations within this unit on the Natural Values Atlas. Given its low numbers and its WONS and Declared status it should be treated as a high priority for control.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- Due to the higher quality of the vegetation, the large contiguous nature of this patch and its corresponding habitat value, weed control is seen as a higher priority than in other areas of the study area.
- Weed control in this unit could cause soil stability and erosion problems if it is done too quickly. In areas of severe erosion, control would need to be spread out in stages over several years to minimise the potential impacts.
- In some sections where the weeds are particularly dense, they may provide habitat particularly for small birds and mammals. In these areas undertaking this also in stages and in conjunction with revegetation so that habitat is replaced is recommended.

- Initial control of the weeds is estimated at 15 days work for a team of 4 bushcare workers. However these 15 days would need to be spread out over 4 or 5 years to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.
- Control of serrated tussock should be controlled as a separate priority to the above weed control program due to its significance.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Protection of native vegetation

- The vegetation within this unit is in good condition and provides valuable habitat for flora and fauna species. Maintaining the condition and extent of native vegetation in this unit should be seen as a priority.
- The majority of the vegetation within this unit is private property, so collaboration and relationship development with landholders will be crucial.

3. Fencing and stock control

- While some sections of this unit are fenced off from the adjacent land uses, large portions are not fenced off, allowing stock to access quality areas of native vegetation. This was a significant degrading factor in the area of *Eucalyptus amygdalina* coastal forest and woodland and the adjacent succulent saline herbland. Pugging of soils and plant damage was particularly evident in this area.
- Several sections of agricultural land surrounding the Duckhole Rivulet bay area are currently not fenced off from the shoreline. During the time of the survey, no stock were in these areas, but if they are ever grazed in this area, the area of degradation could increase.
- Fencing off of these higher quality areas in particular should be seen as a priority.

4. Bank erosion control

- Bank erosion is occurring along the cliffs and high energy banks of this unit, and it is particularly severe around the Duckhole Rivulet bay area.
- A gradual loss of land and vegetation is occurring and will continue to occur as the shoreline collapses, taking vegetation with it.
- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

5. Rubbish removal

- Two small rubbish dump sites occur - one on the beach/cliff in the patch of *Eucalyptus viminalis* grassy forest and woodland, and the second on the southern side of the Duckhole Rivulet bay area.
- A program to remove the rubbish dump would be of benefit to the amenity, water quality and habitat value of the area.

6. Vegetation survey

- A vegetation survey that compiles a complete species list for the woodland areas of this unit is recommended. The area of *Eucalyptus amygdalina* coastal forest and woodland in particular should be surveyed for threatened orchid species which are considered a possibility to occur in this habitat type.
- The native grasslands should also be assessed against the EPBCA criteria to determine if they qualify for listing as a threatened community under the EPBC Act.

7. Acid sulphate soils

- Government data ((DPIPWE) indicates that a significant proportion of this unit are a high risk area for acid sulphate soil development. This area coincides with the lower lying saline areas.
- Disturbance of soils and vegetation in these areas should not be allowed, as this is the highest risk factor in the development of acid sulphate soils.

Management Unit 6 - Upper Pitt Water West

Description

This management unit encompasses the land starting at Lands End, heading north along the eastern shore to the top of the study area on the Coal River. This unit contains approximately 7 kilometres of foreshore.

The land tenure for this entire unit is private property. The aquatic section of this unit (to the high water mark) is part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS). A large section of this unit: the northern most section of succulent saline herbland is currently protected under a Conservation Covenant.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by Succulent saline herbland, Bursaria - Acacia woodland and scrub and Agricultural land. Some smaller sections of Lowland grassland complex and Coastal grass and herbfield also occur.
Vegetation Communities	• Saline sedgeland/rushland (ARS) • Succulent saline herbland (ASS) • Agricultural land (FAG) • Lowland grassland complex (GCL) • Coastal grass and herbfield (GHC) • Bursaria - Acacia woodland and scrub (NBA) • Sand, mud (OSM)
Vegetation Condition	Areas of Saline sedgeland/rushland and Succulent saline herbland are in good condition; however the remaining vegetation is generally in a poor to average condition. Weeds are common and some significant cliff sections are eroding. The Succulent saline herbland areas within this unit are recommended to be included as a Priority Vegetation Area (inclusive of the same vegetation types in unit 7) because of its good condition, large cumulative area and potential fauna habitat values.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Austrostipa scabra** (r/-) • *Calocephalus citreus** (r/-) • *Limonium australe* (r/-) • *Vittadinia cuneata** (r/-)

Threatened Fauna (NVA Records)	No threatened fauna species were recorded from within this unit.
Fauna Habitat	Areas of Saline sedgeland/rushland and Succulent saline herbland are in good condition and would provide good habitat for a variety of sea bird species. This unit does not contain areas identified by Birds Tasmania as important roosting or feeding areas, although the use of this area by important species is not discounted. The other native woodland areas are small and relatively isolated, and have only minimal habitat value. However these areas would still provide some habitat value most probably for more common species.
Weeds	• African boxthorn • briar rose • gazania • gorse
Weed Description and Comments	Weeds are moderate to severe in most parts of this section, particularly in the native woodland and agricultural land sections. African boxthorn is the most abundant weed being common throughout the unit. Smaller patches of briar rose and gorse occur, along with one isolated gazania plant, which presents a good opportunity for eradication while still in low numbers. Serrated Tussock is a Weed of National Significance that has been recorded at nine locations within this unit on the Natural Values Atlas. Given its relatively low numbers and its WONS and Declared status it should be treated as a high priority for control.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- Due to the lower quality of the vegetation and its corresponding habitat value, weed control is seen as a lower priority than in other areas of the study area.
- Weed control in this unit could cause soil stability and erosion problems if it is done too quickly. In areas of severe erosion, control would need to be spread out in stages over several years to minimise the potential impacts.
- In some sections where the weeds are particularly dense, they may provide habitat particularly for small birds and mammals. In these areas undertaking this also in stages and in conjunction with revegetation so that habitat is replaced is recommended.
- Initial control of the weeds is estimated at 22 days work for a team of 4 bushcare workers. However these 22 days would need to be spread out over 4 or 5 years to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.

- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Protection of succulent saline herblands

- The succulent saline herbland areas within this unit are in relatively good condition and provides potentially important sea bird habitat.
- Maintaining the condition and extent of succulent saline herbland areas in this unit should be seen as a priority.
- The majority of the vegetation within this unit is private property, so collaboration and relationship development with landholders will be crucial.

3. Bank erosion control

- Bank erosion is occurring along some of the cliffs and high energy banks of this unit.
- A gradual loss of land and vegetation is occurring and will continue to occur as the shoreline collapses, taking vegetation with it.
- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

4. Fencing

- The large southern section of Succulent saline herbland is currently unfenced from the adjacent agricultural land. At times of stock grazing this would result in damage to the soils and vegetation in this area.
- This issue needs to be assessed further with an on site inspection and discussion with the landowner to see if damage is occurring from stock access. If damage is occurring then funding should be sought to assist the landholder to fence between the foreshore and the agricultural land.

5. Acid sulphate soils

- Government data ((DPIPWE) indicates that some sections of this unit are a high risk area for acid sulphate soil development. This area coincides with the lower lying saline areas.
- Disturbance of soils and vegetation in these areas should not be allowed, as this is the highest risk factor in the development of acid sulphate soils.

Management Unit 7 - Upper Pitt Water East

Description

This management unit encompasses the land starting at the top of the study area on the Coal River, and heads south along the western shore to Horatio Point. It also includes the offshore islands of Samphire Island and Billy's Island. This unit contains approximately 12 kilometres of foreshore.

The land tenure for this entire unit is private property. The aquatic section of this unit (to the high water mark) is part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS). Most of this unit was assessed from the opposite shore; the land was not accessed for a thorough survey.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by Succulent saline herbland and Agricultural land. Some smaller sections of *Eucalyptus viminalis* grassy forest and woodland, Bursaria - Acacia woodland and scrub, *Allocasuarina verticillata* forest and Coastal grass and herbfield also occur.
Vegetation Communities	• Succulent saline herbland (ASS) • *Eucalyptus viminalis* grassy forest and woodland (DVG) • Agricultural land (FAG) • Coastal grass and herbfield (GHC) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA)
Vegetation Condition	Areas of Succulent saline herbland appear to be in good condition, however the remaining vegetation generally appears to be in a poor to average condition, with weeds being scattered throughout, but not abundant. The Succulent saline herbland areas within this unit are recommended to be included as a Priority Vegetation Area (inclusive of the same vegetation types in unit 6) because of their good condition, large cumulative area and potential fauna habitat values.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Austrostipa scabra* (r/-) • *Wilsonia humilis* (r/-)
Threatened Fauna (NVA Records)	No threatened fauna species were recorded from within this unit.

Fauna Habitat	Areas of Succulent saline herbland appeared to be in good condition and would provide good habitat for a variety of sea bird species. This unit does not contain areas identified by Birds Tasmania as important roosting or feeding areas, although the use of this area by important species is not discounted. The other native woodland areas are small and relatively isolated, and have only minimal habitat value. However these areas would still provide some habitat value most probably for more common species.
Weeds	• African boxthorn
Weed Description and Comments	Weeds appear to be dominated by African boxthorn, and there is a moderate infestation around the eastern shore of the Halfmoon Inlet. Scattered plants of African boxthorn occur around the remainder of this unit.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- Due to the lower quality of the vegetation and its corresponding habitat value, weed control is seen as a lower priority than in other areas of the study area.
- Adjacent to the Halfmoon Inlet, control would need to be carried out in conjunction with revegetation so that habitat is replaced and soil stability is not threatened.
- Initial control of the weeds is estimated at 3.5 days work for a team of 4 bushcare workers. Follow up work is not included in this estimate but is essential.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Protection of succulent saline herblands

- The succulent saline herbland areas within this unit are in relatively good condition and provides potentially important sea bird habitat.
- Maintaining the condition and extent of succulent saline herbland areas in this unit should be seen as a priority.
- The majority of the vegetation within this unit is private property, so collaboration and relationship development with landholders will be crucial.

3. Revegetation

- This unit suffers from a general paucity of native vegetation and trees around the entire foreshore area, resulting in little habitat value for native species. Given landholder support, the foreshore could be part of a large scale revegetation project to re-create habitat and link isolated native vegetation remnants.

4. Fencing

- The northern half of this unit appears to be largely unfenced from the adjacent agricultural land. At times of stock grazing this would result in damage to the soils and vegetation in the Succulent saline herbland and other remnants.
- This issue needs to be assessed further with an on site inspection and discussion with the landowner to see if damage is occurring from stock access. If damage is occurring then funding should be sought to assist the landholder to fence between the foreshore and the agricultural land.

5. Acid sulphate soils

- Government data ((DPIPWE) indicates that a significant proportion of this unit are a high risk area for acid sulphate soil development. This area coincides with the lower lying saline areas.
- Disturbance of soils and vegetation in these areas should not be allowed, as this is the highest risk factor in the development of acid sulphate soils.

Management Unit 8 - Mid Pitt Water East

Description

This management unit encompasses the land from Horatio Point in the north to Shark Point in the south. This unit contains approximately 4.5 kilometres of foreshore.

The land tenure for most of this unit is private property, apart from a small strip of land at the southern end. The very northern section of this unit (the aquatic section only) is part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS). Shark Point Road Conservation Area, which is soon to be declared (pers comm. C. Markby, November 2011) will cover the southern end of this unit.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by plantations of pines and native revegetation. A thin strip of *Allocasuarina verticillata* forest runs along the cliff top for large sections, with a large patch of Succulent saline herbland and Coastal grass and herbfield dominating the middle section on the flat low lying land.
Vegetation Communities	• Succulent saline herbland (ASS) • Wetland (undifferentiated) (AWU) • Agricultural land (FAG) • Plantations for silviculture (FPL) • Coastal grass and herbfield (GHC) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA)
Vegetation Condition	Some parts of the *Allocasuarina verticillata* forest (NAV) are in a surprisingly good condition given their very narrow size. The remaining areas are in a poor condition.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	Wetland (undifferentiated) is listed as a threatened vegetation community under the Tasmanian *Nature Conservation Act 2002*. No communities are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
Threatened Flora (NVA records & current survey*)	No threatened flora species were recorded from within this unit.
Threatened Fauna (NVA Records)	No threatened fauna species were recorded from within this unit.
Fauna Habitat	Birds Tasmania data indicates that the central section of this unit contains important habitat for resident sea birds. The

	pied oyster catcher is the main species noted as occurring in this area, and it is known to use the area for both feeding and nesting. Red necked stints were recorded feeding in this area during the current survey. The other native woodland, plantations of pines and native revegetation areas would provide some habitat value most probably for more common species.
Weeds	• African boxthorn • perennial veldt grass • radiata pine • trailing African daisy
Weed Description and Comments	Weeds are in low numbers in this unit. African boxthorn and trailing African daisy are in very low numbers only, and present a good opportunity for eradication while still in low numbers. Perennial veldt grass is a problem in the northern plantations, but is so well established that there is no point in controlling it. Pine wildlings occur more so in the southern half of the unit.

Management Issues and Recommended Actions

1. Weed control

- Due to the lower quality of the vegetation and its corresponding habitat value, weed control is seen as a lower priority than in other areas of the study area.
- Control of African boxthorn, trailing African daisy and pine wildlings could occur immediately.
- Initial control of the weeds is estimated at 0.5 days work for a team of 4 bushcare workers. Follow up work is not included in this estimate but is essential.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Acid sulphate soils

- Government data ((DPIPWE) indicates that some parts of this unit are a high risk area for acid sulphate soil development. This area coincides with the lower lying saline areas, but also with a higher section of the northern cliff area.
- Disturbance of soils and vegetation in these areas should not be allowed, as this is the highest risk factor in the development of acid sulphate soils.

3. Revegetation

- If the pine plantations are ever harvested, these areas could be targeted for revegetation with species from the *Allocasuarina verticillata* forest, which would have been the original vegetation type in most of this unit.
- This would increase the amount of habitat and link isolated native vegetation remnants.

4. Aboriginal heritage

- Several middens occur within this unit.
- Any revegetation, weed control or other works carried out should as a clear objective avoid damaging areas of Aboriginal heritage. Consultation should occur with Aboriginal heritage authorities if any work is planned to avoid damage to any significant areas.

Management Unit 9 - Shark Point Road

Description

This management unit encompasses the land from Shark Point in the south to the western end of the Penna Bay Coastal Reserve. This unit contains approximately 4.5 kilometres of foreshore.

The land tenure in this unit is a relatively even mix of private property and public land. As a general rule the seaward side of the study area is public land, while the landward side of the study area is private property, although in several areas private property extends down to the high water mark. Shark Point Road Conservation Area, which is soon to be declared (pers comm. C. Markby, November 2011) will cover all of the crown land within this unit.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by *Eucalyptus viminalis* grassy forest and woodland and Bursaria - Acacia woodland and scrub. The whole unit is interspersed with areas of housing (Urban areas).
Vegetation Communities	• Eucalyptus viminalis grassy forest and woodland (DVG) • Agricultural land (FAG) • Plantations for silviculture (FPL) • Urban areas (FUR) • Coastal grass and herbfield (GHC) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA)
Vegetation Condition	Given the urban housing within this unit, the vegetation condition is average, being relatively degraded with weeds and other disturbances. The condition however does vary with some areas still being in a relatively good condition.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Austrostipa scabra** (r/-) • *Calocephalus citreus* (r/-) • *Vittadinia gracilis** (r/-) • *Vittadinia muelleri** (r/-)
Threatened Fauna (NVA Records)	No threatened fauna species were recorded from within this unit.
Fauna Habitat	Due to the degraded nature of the native vegetation within this unit and the close proximity of urban housing, the habitat values are not considered to be high. However the native

	woodland areas would still provide some habitat value most probably for the more common species. This unit does not contain areas identified by Birds Tasmania as important roosting or feeding areas, although the use of this area by important species is not discounted.
Weeds	• African boxthorn • blackberry • boneseed • briar rose • cape ivy • fennel • Hottentot fig • Montpellier broom • perennial veldt grass • radiata pine • trailing African daisy
Weed Description and Comments	Weeds are generally common in this unit, and in some sections were abundant to the point of eliminating the native vegetation. There was a relatively widespread distribution across the unit up to the Penna Bay Coastal Reserve, where weed abundance decreased considerably. Significant control works have been carried out on boneseed within this unit since 2008 by the Southern Tasmanian Weed Strategy (S. Leighton, pers. Comm., Oct 2011). This program is attempting to significantly reduce the amount of boneseed from this area, and has followed up on this work in the years since 2008. It is unsure whether this program will continue into the future due to funding constraints. Bridal creeper is a Weed of National Significance that has been recorded at one location within this unit on the Natural Values Atlas. This record has been treated in 2009 as part of the weed control program being run by Sandy Leighton of the Southern Tasmanian Weed Strategy. Five other records occur in this area, but fall outside of the study area. Given its low numbers, its WONS and Declared status and the work already being carried out, it should be treated as a high priority for follow up control.

Management Issues and Recommended Actions

1. Weed control

- Whilst not currently as important as some other areas in the study area, the native vegetation within this unit could be improved considerably with the implementation of a weed control program, with subsequent benefits to vegetation quality, habitat value and visual amenity.
- Due to the urban nature of this unit it is difficult to estimate the time involved for weed control and the structure of this task at the level of this action plan. Boundary issues and the encroachment of gardens into public land has blurred the weed control issue so that it is not such a simple task.

- It is recommended that to fully understand this issue a detailed weed survey and management plan be written to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a strategy for communicating with landholders and resolving any weed/garden issues. It should also cover soil and erosion management issues.
- Control of bridal creeper should be controlled as a separate priority to the above weed control program due to its significance.
- It should be emphasised that the involvement of the local landholders will be critical to the success of any weed control program in this area.
- See map for location and level of weed infestations.

2. Soil erosion

- Severe soil erosion issues were not obvious within this unit during the field survey, with only some moderate bank erosion and minor shoreline undercutting being recorded. However this unit has been identified (S. Leighton, pers. Comm., Oct 2011) as an area where dispersive soils and tunnel erosion is an issue.
- Consultation with soil experts should occur before any works, particularly weed control, are carried out within this unit.
- See map for locations of erosion issues.

3. Aboriginal heritage

- Several middens occur within this unit.
- Any revegetation, weed control or other works carried out should as a clear objective avoid damaging areas of Aboriginal heritage. Consultation should occur with Aboriginal heritage authorities if any work is planned to avoid damage to any significant areas.

4. Boundary issues

- Further encroachment of gardens and other structures into public land will add to the degradation currently occurring to the native vegetation on public land.
- Resolving this issue in an amicable way could lead to positive outcomes for biodiversity and vegetation quality.
- The declaration of the Shark Point Road Conservation Area will allow PWS to manage any boundary and landowner encroachment issues in the future.

Management Unit 10 - Midway Point

Description

This management unit encompasses the land from the eastern end of the Penna Bay Coastal Reserve, around Midway Point to the start of the Succulent saline herbland at the southern end of the golf course. It includes the small island off the southern tip of Midway Point. This unit contains approximately 6 kilometres of foreshore.

The land tenure in this unit is a relatively even mix of private property and public land. Several tenures exist including private, conservation area, nature reserve, and also land owned by Southern Water and Sorell Council. As a general rule the seaward side of the study area is public land, while the landward side of the study area is private property. However, around the southern section of Midway Point (between the two causeways) private property extends down to the high water mark.

Natural Values Assessment	
Vegetation Description	The vegetation on the western side of this unit within this management unit is dominated by *Allocasuarina verticillata* forest and is interspersed with urban areas and agricultural land. On the southern and eastern side, the vegetation is dominated by *Eucalyptus viminalis* grassy forest and woodland and is interspersed with urban areas.
Vegetation Communities	• Succulent saline herbland (ASS) • Eucalyptus viminalis grassy forest and woodland (DVG) • Agricultural land (FAG) • Extra-urban miscellaneous (FUM) • Urban areas (FUR) • *Allocasuarina verticillata* forest (NAV) • Bursaria - Acacia woodland and scrub (NBA)
Vegetation Condition	Within this unit, the vegetation closer to housing is more degraded with rubbish and weeds. The condition however does vary with some areas still being in a relatively good condition. The vegetation on the western side of this unit is recommended to be included as a Priority Vegetation Area because of its relatively good condition and prospect for remediation.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Lepidium pseudotasmanicum* (r/-) • *Vittadinia muelleri** (r/-)

Threatened Fauna (NVA Records)	• eastern barred bandicoot (-/VU) • live-bearing seastar (v/VU) • masked owl (e/VU) • Tasmanian devil (e/EN)
Fauna Habitat	Birds Tasmania have indicated that the eastern side of Midway Point and Orielton Lagoon is an important feeding and roosting areas for migratory and resident shore and sea birds (pers comm. E. Woehler, October 2011). Significant species known to use this area for feeding include the musk duck, hoary-headed grebe and great crested grebe. Species that roost in the area include the pied oyster catcher and the white faced heron, while nesting species include the black swan and the masked lapwing. Due to the close proximity of urban housing, the habitat values are not considered to be high. However the native woodland areas would still provide some habitat value most probably for the more common species.
Weeds	• African boxthorn • blue butterfly bush • blue periwinkle • boneseed • briar rose • cotoneaster • fennel • gazania • mirrorbush • Montpellier broom • prickly pear • radiata pine • succulents (various species) • trailing African daisy
Weed Description and Comments	Weeds are generally common in this unit, particularly around the southern section of the point where private property commonly goes to the high water mark. In this section much of the vegetation has been significantly altered by garden plantings and escapes. The eastern and western sections are more variable with good sections still occurring amongst the weedier sections. As a general rule, the density of weeds decreases the further away you get from the urban areas. Significant control works have been carried out on boneseed within this unit since 2008 by the Southern Tasmanian Weed Strategy (S. Leighton, pers. Comm., Oct 2011). This program is attempting to significantly reduce the amount of boneseed from this area, and has followed up on this work in the years since 2008. It is unsure whether this program will continue into the future due to funding constraints.

Management Issues and Recommended Actions

1. Weed control

- Whilst not currently as important as some other areas in the study area, the native vegetation within this unit could be improved considerably with the implementation of a weed control program, with subsequent benefits to vegetation quality, habitat value and visual amenity.
- Due to the urban nature of this unit it is difficult to estimate the time involved for weed control and the structure of this task at the level of this action plan.
- It is recommended that to fully understand this issue a detailed weed survey and management plan be written to provide full location details, recommended timing and methods and a more detailed costing.
- It should be emphasised that the involvement of the local landholders will be critical to the success of any weed control program in this area.
- See map for location and level of weed infestations.

2. Rubbish dumping

- Dumping of rubbish and garden wastes is degrading the native vegetation, with garden waste adding to the weed problem.
- An awareness raising campaign focusing on rubbish dumping and garden wastes, targeted to the residents of Midway Point should be implemented.
- This site could be incorporated into the "Clean Up Australia Day" program.

3. Protection of native vegetation

- The native vegetation along the western side of this unit is in relatively good condition and provides potentially important fauna habitat.
- Maintaining the condition and extent of this vegetation should be seen as a priority.

4. Aboriginal heritage

- Several middens occur within this unit.
- Any revegetation, weed control or other works carried out should as a clear objective avoid damaging areas of Aboriginal heritage. Consultation should occur with Aboriginal heritage authorities if any work is planned to avoid damage to any significant areas.

5. Feral animals

- Evidence of rabbits was recorded on the north western section of Midway Point and these are likely to be having a detrimental effect on native vegetation and soils in the unit.
- Where possible a regional control program should be implemented with the assistance of local landholders.

Management Unit 11 - Orielton Lagoon

Description

This management unit encompasses the land from the start of the Succulent saline herbland at the southern end of the golf course around to the Tasman Highway causeway at Sorell. It includes Susie Islet in Orielton Lagoon. This unit contains approximately 6.5 kilometres of foreshore.

The land tenure in this unit is a mixture of private property and public land, with public land predominating. Several tenures exist including conservation area, nature reserve, and crown land. The aquatic section of this unit (to the high water nark) and some of the adjacent land units, including significant areas of succulent saline herblands, are part of the Pitt Water Nature Reserve, which is managed by the Tasmanian Parks and Wildlife Service (PWS).

Natural Values Assessment	
Vegetation Description	The vegetation in this unit is dominated by Succulent saline herbland, agricultural land and areas of extra-urban miscellaneous.
Vegetation Communities	• Succulent saline herbland (ASS) • Agricultural land (FAG) • Extra-urban miscellaneous (FUM) • Lowland grassland complex (GCL) • Bursaria - Acacia woodland and scrub (NBA) • Water, sea (OAQ) • Sand, mud (OSM) • Coastal heathland (SCH) (unverified - on Susie Islet)
Vegetation Condition	Areas of Succulent saline herbland appear to be in good condition, however the remaining vegetation generally appears to be in a poor to average condition, with weeds being scattered throughout, but not abundant. The Succulent saline herbland areas within this unit are recommended to be included as a Priority Vegetation Area because of their good condition, large cumulative area and fauna habitat values.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Austrostipa scabra* (r/-)* • *Calocephalus citreus* (r/-)* • *Carex tasmanica* (-/VU) • *Haloragis heterophylla* (r/-)

	• *Vittadinia gracilis** (r/-) • *Wilsonia rotundifolia** (r/-)
Threatened Fauna (NVA Records)	• great crested grebe (v/-) • green and gold frog (v/VU) • saltmarsh looper moth (v/)
Fauna Habitat	Birds Tasmania have indicated that Orielton Lagoon is one of the most important areas in the PWOL ramsar site for migratory and resident shore and sea birds (pers comm. E. Woehler, October 2011). The entire lagoon area is considered to be important for feeding, nesting and/or roosting for several bird species. Habitat used by these species focuses on the Succulent saline herbland, and also the shallow tidal areas and flats exposed at low tide. Susie Islet, within the lagoon, is also an important roosting and breeding area for sea birds. Significant species known to use this area for feeding include the musk duck, hoary-headed grebe, great crested grebe, black swan, pied oyster catcher (recorded during current field survey), Pacific golden plover, double-banded plover and red-capped plover. The Australasian shelduck, double-banded plover, Pacific golden plover, red-necked stint, white faced heron, and the pied oyster catcher also use the area for roosting. The red-capped plover and pied oyster catcher also use the area for nesting. A nest containing two eggs was found amongst samphire plants in the succulent saline herbland. The species remains unknown. Threatened species previously recorded that may also use these habitats include the saltmarsh looper moth. The remaining area outside of the succulent saline herbland areas offers relatively little habitat value.
Weeds	• African boxthorn • briar rose • fennel • gorse
Weed Description and Comments	The level of weed infestation within this unit is low for the entire unit, although scattered weeds do occur, and a couple of sections have moderate infestations.

Management Issues and Recommended Actions

1. Weed control

- Due to the relatively low numbers (see description above) of weeds in this unit, weed control is seen as a high priority.
- Initial control of the weeds listed above is estimated at 3 days work for a team of 4 bushcare workers. Follow up work is not included in this estimate but is essential.
- A detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing.

- Any weed control program should be done in collaboration with local landholders.
- Due to the minor nature of the weed control required in this area, it should not pose a threat to soil stability or exacerbate erosion problems. However, a management plan (see above) should look further into this issue and consult with soil specialists to confirm this.
- See map for location and level of weed infestations.

2. Protection of succulent saline herblands

- The succulent saline herbland areas within this unit are in relatively good condition and provide important sea bird habitat.
- Maintaining the condition and extent of succulent saline herbland areas in this unit should be seen as a priority.
- Protection of native vegetation areas and limitation of further development are recommended to reduce disturbance to sea bird populations.
- Some parts of the vegetation within this unit are private property, so collaboration and relationship development with landholders will be crucial.

3. Soil erosion

- Severe soil erosion issues were not obvious within this unit during the field survey. However this unit, and particularly the eastern side of Orielton Lagoon, has been identified (S. Leighton, pers. Comm., Oct 2011, Carol Markby, pers. comm., Nov 2011) as an area of dispersive soils and where tunnel erosion is an issue.
- Consultation with soil experts should occur before any works, particularly weed control, are carried out within this unit.
- See map for locations of erosion issues.

Management Unit 12 - Inghams Point

Description

This management unit encompasses the land from the Tasman Highway causeway at Sorell around the point and into the Sorell Rivulet estuary, finishing where the first succulent saline herblands start. This unit contains approximately 1.5 kilometres of foreshore.

The land tenure for most of this unit is private property, apart from a small strip of land at the northern end.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by agricultural land and an area of extra-urban miscellaneous.
Vegetation Communities	• Agricultural land (FAG) • Extra-urban miscellaneous (FUM)
Vegetation Condition	Very little native vegetation remains in this unit which is dominated by weeds. Consequently the condition of the vegetation is very poor.
Priority Vegetation Area	
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	No threatened flora species were recorded from within this unit.
Threatened Fauna (NVA Records)	• eastern curlew (e/-)
Fauna Habitat	Birds Tasmania data indicates that all of this unit contains important feeding habitat for many different sea birds, and roosting habitat for kelp gulls. This habitat is largely restricted to the beach and flats exposed at low tide. The remaining area on land offers relatively little habitat value, due to its degraded nature.
Weeds	• African boxthorn
Weed Description and Comments	African boxthorn is abundant in this unit, except for where control work and revegetation has been undertaken. It forms extensive thickets outside of these areas.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- Due to the relatively high numbers (see description above) of weeds, the poorer quality of the vegetation, and the lower habitat value, weed control is seen as a lower priority than in other areas of the study area.
- Weed control in this unit could cause soil stability and erosion problems if it is done too quickly. In areas of severe erosion, control would need to be spread out in stages over several years to minimise the potential impacts.
- In some sections where the weeds are particularly dense, they may provide habitat particularly for small birds and mammals. In these areas undertaking this also in stages and in conjunction with revegetation so that habitat is replaced is recommended.
- An estimate on weed control in an area such as this one is very difficult given the abundance of weeds and potential erosion issues. However, initial control of the weeds is estimated at 35 days work for a team of 4 bushcare workers. However these 35 days would need to be spread out over 4 or 5 years, or longer, to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan, and soil erosion control plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Bank erosion control

- Is quite severe, particularly along the western shoreline up to the first point (before reaching Ingham's factory).
- This unit as a whole has been identified (S. Leighton, pers. Comm., Oct 2011, Carol Markby, pers. comm., Nov 2011) as an area of dispersive soils and where tunnel erosion is occurring.
- If allowed to continue a gradual loss of land will continue to occur as the shoreline collapses, taking vegetation with it.
- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

3. Revegetation

- This unit suffers from a general paucity of native vegetation and trees around the entire foreshore area, resulting in little habitat value for native species.
- Inghams have implemented a revegetation and boxthorn control program for approximately 400m, occurring on either side of the factory.
- This program should be supported and continued to extend the revegetation area throughout this unit. Such a project would help to re-create habitat in this area.

Management Unit 13 - Sorell Rivulet

Description

This management unit encompasses the land on both sides of the Sorell Rivulet. It includes the succulent saline herblands surrounding the mouth of the Sorell Rivulet and the small point on the eastern side of the estuary. This unit contains approximately 2.5 kilometres of foreshore.

The land tenure in this unit is a mixture of private property and public land, with public land predominating. Grassy Point Conservation Area, which is soon to be declared (pers comm. C. Markby, November 2011) will cover all of the crown land within this unit.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by Succulent saline herbland and agricultural land. There is a small area of extra-urban miscellaneous.
Vegetation Communities	• Succulent saline herbland (ASS) • Agricultural land (FAG) • Extra-urban miscellaneous (FUM)
Vegetation Condition	Areas of Succulent saline herbland appear to be in good condition, however. The remaining areas are in a poor condition, with little native vegetation remaining.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Austrostipa scabra** (r/-) • *Calocephalus citreus** (r/-)
Threatened Fauna (NVA Records)	• eastern barred bandicoot (-/VU)
Fauna Habitat	Birds Tasmania data indicates that around the mouth of the Sorell Rivulet estuary is important habitat for resident and migratory sea birds. The pied oyster catcher (recorded during field survey) is the main species noted as occurring in this area, and it is known to use the area for both feeding and nesting. Part of the mouth area is also important feeding habitat for many different sea birds, and roosting habitat for kelp gulls. The remaining area on land offers relatively little habitat value, due to its degraded nature.
Weeds	• African boxthorn

	• briar rose
Weed Description and Comments	Weeds are in large numbers in this unit, particularly African boxthorn and to a lesser extent briar rose.

Management Issues and Recommended Actions

1. Weed control and Revegetation

- Due to the relatively high numbers (see description above) of weeds, the poorer quality of the vegetation, and the lower habitat value, weed control is seen as a lower priority than in other areas of the study area.
- Weed control in this unit could cause soil stability and erosion problems if it is done too quickly. In areas of severe erosion, control would need to be spread out in stages over several years to minimise the potential impacts.
- In some sections where the weeds are particularly dense, they may provide habitat particularly for small birds and mammals. In these areas undertaking this also in stages and in conjunction with revegetation so that habitat is replaced is recommended.
- An estimate on weed control in an area such as this one is very difficult given the abundance of weeds and potential erosion issues. However, initial control of the weeds is estimated at 40 days work for a team of 4 bushcare workers. However these 40 days would need to be spread out over 4 or 5 years, or longer, to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan, and soil erosion control plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Revegetation

- Outside of the succulent saline herbland areas, this unit suffers from a general paucity of native vegetation and trees around the entire foreshore area, resulting in little habitat value for native species.
- Given landholder and community support, most of this unit could be part of a large scale revegetation project to re-create habitat within the estuary area and further up Sorell Rivulet. This would increase the amount of habitat and link isolated native vegetation remnants.

3. Encroachment of industrial development

- Industrial development has seen the removal and or degradation of native vegetation particularly on the western side of Sorell Creek. No further

encroachment of industrial development into native vegetation should be allowed to occur.

- This unit, being so close to Sorell, is more at risk of being developed for industrial or residential development, which is likely to further degrade this unit.
- Discussion with the Sorell Council should occur to highlight the ecological values of this unit. Any development in the area should only be allowed with a suitable buffer between it and the Sorell Creek.
- The declaration of the Grassy Point Conservation Area may help PWS to manage any boundary and development issues in the future.

Management Unit 14 - Lower Pitt Water Beach

Description

This management unit encompasses the land from just east of the Sorell Rivulet point; east along the beach and around the sand spit, and finishes directly opposite Flinty Point. This unit contains approximately 3.5 kilometres of foreshore.

The land tenure in this unit is predominantly public land. As a general rule, the seaward side of this unit is public land, while parts of the landward side of the unit are private property. Grassy Point Conservation Area, which is soon to be declared (pers comm. C. Markby, November 2011) will cover all of the crown land within this unit.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by agricultural land along the beach section in the west of the unit. On the sand spit area Coastal grass and herbfield and Succulent saline herbland predominate, while behind this area on the low hill slopes native grasslands and woodlands predominate.
Vegetation Communities	• Succulent saline herbland (ASS) • Agricultural land (FAG) • Coastal grass and herbfield (GHC) • Lowland Poa labillardierei grassland (GPL) • Lowland Themeda triandra grassland (GTL) • Bursaria - Acacia woodland and scrub (NBA)
Vegetation Condition	The sand spit area and low hills behind are in a relatively good condition although weeds are invading the native woodland areas. The remaining area along the beach section is in a very poor condition.
Priority Vegetation Area	The vegetation within this area is recommended to be included as a Priority Vegetation Area because of its intactness and potential fauna habitat values.
Threatened Vegetation Communities	Lowland *Themeda triandra* grassland and Lowland Poa labillardierei grassland are both part of the complex known as Lowland Native Grasslands of Tasmania which is listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. It is only listed however when it meets certain condition criteria, which needs to be assessed by a qualified ecologist. Until this area is surveyed and assessed it can not be definitively determined whether this area is listed or not.
Threatened Flora (NVA records & current survey*)	• *Wilsonia humilis** (r/-) • *Vittadinia muelleri* (r/-)
Threatened	No threatened fauna species were recorded from within this

Fauna (NVA Records)	unit.
Fauna Habitat	Birds Tasmania data indicates that the sand spit area at the entrance to Iron Creek Bay is important habitat for resident and migratory sea birds. Migratory birds including the eastern curlew and the red-necked stint have been recorded feeding in the area. The resident pied oyster catcher is known to use the area for feeding, and many different species roost around the spit area. Pied oyster catchers were recorded feeding during the current survey along the beach to the west of the sand spit, and also on the sand spit itself. A nest containing two eggs was found on the beach. The other native woodland and grasslands inland from the sand spit are relatively intact and large enough to offer some habitat value for native species.
Weeds	• African boxthorn • briar rose • fennel • hawthorn • gorse
Weed Description and Comments	Weed densities are severe in this unit, particularly in the agricultural land backing the beach and also in the native woodlands. The sand spit area is relatively free of weeds.

Management Issues and Recommended Actions

1. Weed control

- Whilst not currently as important as some other areas in the study area, the native vegetation within this unit could be improved considerably with the implementation of a weed control program, with subsequent benefits to vegetation quality, habitat value and visual amenity.
- In the areas of denser weeds, control could cause soil stability and erosion problems if it is done too quickly. Weed control would need to be spread out in stages over several years to minimise the potential impacts.
- In these denser areas, particularly along the beach section where there is little other native vegetation cover, the weeds may provide habitat particularly for small birds and mammals. In these areas a staged approach in conjunction with revegetation so that habitat is replaced is recommended.
- Initial control of the weeds is estimated at 25 days work for a team of 4 bushcare workers. However these 25 days would need to be spread out over 4 or 5 years to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and

methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Shoreline erosion

- Minor shoreline undercutting was recorded along the beach area.
- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

3. Revegetation

- Outside of the sand spit area and low hills behind this unit suffers from a general paucity of native vegetation, particularly along the beach section, resulting in little habitat value for native species.
- Given landholder and community support, the beach section could be part of a large scale revegetation project to re-create habitat.

4. Protection of native vegetation

- The native vegetation on the sand spit area and low hills behind is in relatively good condition and provides potentially important fauna habitat if weeds are controlled.
- Restoring the condition and maintaining the extent of this vegetation should be seen as a priority.
- Parts of this vegetated area are private property, so collaboration and relationship development with landholders will be crucial.
- The establishment of the PWS conservation area within this unit should help to protect the native vegetation within this unit.

5. Vegetation survey

- A vegetation survey that compiles a complete species list for the sand spit area and low hills behind is recommended, to determine the importance of this area for threatened species conservation.
- The native grasslands should also be assessed against the EPBCA criteria to determine if they qualify for listing as a threatened community under the EPBC Act.

Management Unit 15 - Iron Creek Bay

Description

This management unit encompasses the land from directly opposite Flinty Point on the western side of Iron Creek Bay, up the Iron Creek Bay estuary and around to Shellfish Point in the south. This unit contains approximately 6 kilometres of foreshore.

The land tenure in this unit is a relatively even mix of private property and public land. As a general rule the seaward side of the study area is public land, while the landward side of the study area is private property, although from Flinty Point to Shellfish Point private property extends down to the high water mark. Grassy Point Conservation Area, which is soon to be declared (pers comm. C. Markby, November 2011) will cover part of the crown land within this unit.

Natural Values Assessment	
Vegetation Description	The vegetation within this management unit is dominated by agricultural land, with some very small sections of Succulent saline herbland, Coastal grass and herbfield and Bursaria - Acacia woodland and scrub.
Vegetation Communities	• Succulent saline herbland (ASS) • Agricultural land (FAG) • Coastal grass and herbfield (GHC) • Bursaria - Acacia woodland and scrub (NBA) • Water, sea (OAQ)
Vegetation Condition	Areas of Succulent saline herbland and Coastal grass and herbfield appear to be in good condition; however the remaining areas which contain very little native vegetation are generally in a very poor condition.
Priority Vegetation Area	Not applicable
Threatened Vegetation Communities	No threatened vegetation communities were recorded from within this unit.
Threatened Flora (NVA records & current survey*)	• *Calocephalus citreus* (r/-) • *Vittadinia cuneata* (r/-) • *Vittadinia gracilis** (r/-) • *Vittadinia muelleri* (r/-) • *Wilsonia humilis** (r/-)
Threatened Fauna (NVA Records)	• eastern barred bandicoot (-/VU) • green and gold frog (v/VU)
Fauna Habitat	Birds Tasmania data indicates that the central section of Iron Creek Bay is important habitat for resident and migratory sea birds. Migratory birds including red-necked stint have been

	recorded feeding in the area. The resident pied oyster catcher is known to use the area for feeding, roosting and nesting. The remaining areas outside of the coastal flats offer relatively little habitat value.
Weeds	• African boxthorn • briar rose
Weed Description and Comments	Weed densities are severe in this unit, particularly towards the northern end of the Iron Creek Bay, however the density decreases the further south you go. Dominant weed species are African boxthorn and briar rose.

Management Issues and Recommended Actions

1. Weed control

- Due to the lower quality of the vegetation and its corresponding habitat value, weed control is seen as a lower priority than in other areas of the study area.
- In the areas of denser weeds and steeper slopes, control could cause soil stability and erosion problems if it is done too quickly. Weed control would need to be spread out in stages over several years to minimise the potential impacts.
- In these denser areas the weeds may provide habitat particularly for small birds and mammals. In these areas a staged approach in conjunction with revegetation so that habitat is replaced is recommended.
- Initial control of the weeds is estimated at 25 days work for a team of 4 bushcare workers. However these 25 days would need to be spread out over 4 or 5 years to minimise the risks described above. Follow up work is not included in this estimate but is essential.
- A good way of starting such a project would be to stop any further spread of boxthorn, by removing all the seedlings and small plants, less than half a metre tall. By implementing this initial stage, the problem will not get any worse, and habitat loss and erosion risks will be minimal.
- To fully understand this issue a detailed weed survey and management plan is recommended to provide full location details, recommended timing and methods and a more detailed costing. This plan should incorporate a revegetation plan.
- Any weed control program will need to be carried out in collaboration with private landholders.
- See map for location and level of weed infestations.

2. Shoreline erosion

- Minor and moderate shoreline undercutting was recorded along the western side of the bay.
- Expert advice should be sought to construct a plan to reduce or eliminate this problem.
- See map for locations of erosion issues.

3. Revegetation

- This unit suffers from a general paucity of native vegetation and trees around the entire foreshore area, resulting in little habitat value for native species.

Given landholder support, the foreshore could be part of a large scale revegetation project to re-create habitat and link isolated native vegetation remnants.

4. Fencing and stock control

- While some sections of this unit are fenced off from the adjacent land uses, large portions are not fenced off, allowing stock to access the beach and foeshore area.
- Fencing off of the foreshore area from stock access should be seen as a priority.

Appendix 1 - Figures 3 - 10

The following figures are included as appendices in this action plan:

- Figure 3 - Vegetation Communities
- Figure 4 - Priority Vegetation Areas
- Figure 5 - Weeds
- Figure 6 - Acid Sulphate Soils
- Figure 7 - Erosion
- Figure 8 - Dispersive Soils
- Figure 9 - Sea Bird Habitat
- Figure 10 - Threatened Species

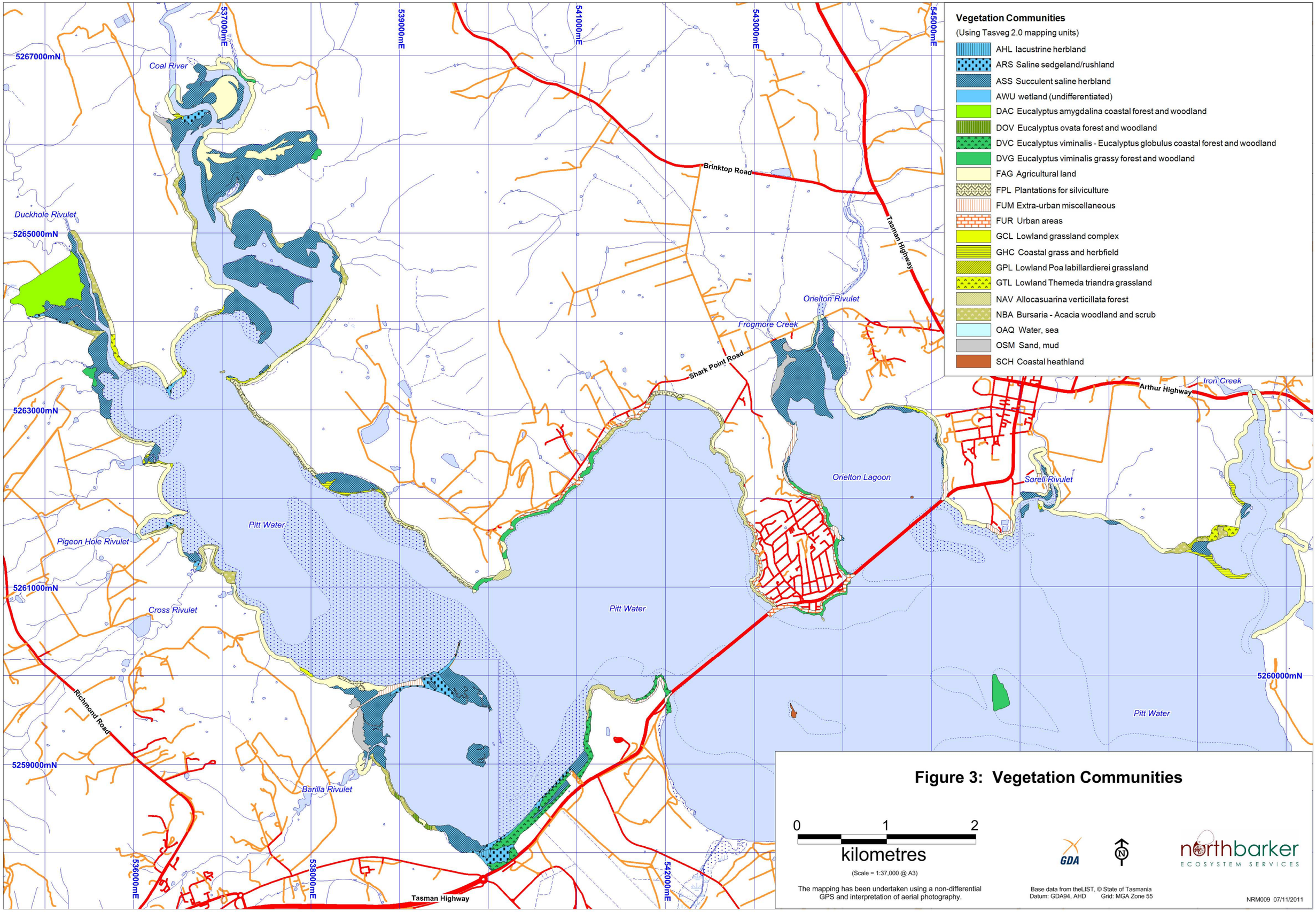

Figure 3: Vegetation Communities

0 1 2
kilometres

(Scale = 1:37,000 @ A3)

The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.

GDA

Base data from theLIST, © State of Tasmania
Datum: GDA94, AHD Grid: MGA Zone 55

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Priority Vegetation Areas

priority vegetation areas

5370000mE
5390000mE
5410000mE
5430000mE
5450000mE
5470000mE

5267000mN
5266000mN
5265000mN
5264000mN
5263000mN
5261000mN
5260000mN
5259000mN

Coal River
Duckhole Rivulet
Brinktop Road
Tasman Highway
Orielton Rivulet
Frogmore Creek
Shark Point Road
Arthur Highway
Iron Creek
Orielton Lagoon
Sorell Rivulet
Pitt Water
Pigeon Hole Rivulet
Cross Rivulet
Richmond Road
Barilla Rivulet
Tasman Highway

5360000mE
5380000mE
5420000mE

Figure 4: Priority Vegetation Areas

0 1 2
kilometres

(Scale = 1:37,000 @ A3)

The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.

GDA

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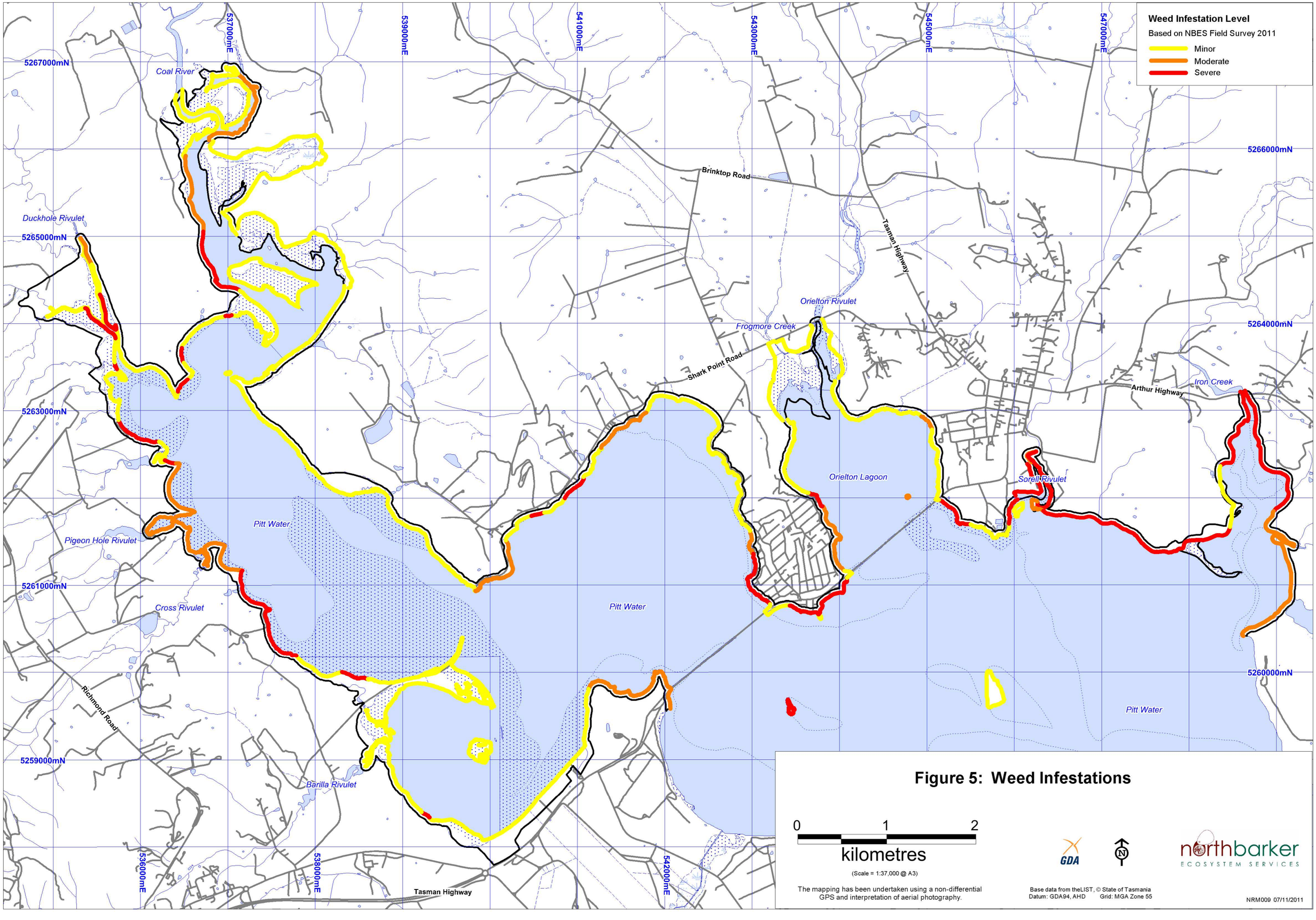

Figure 5: Weed Infestations

0 1 2

kilometres

(Scale = 1:37,000 @ A3)

The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.

GDA

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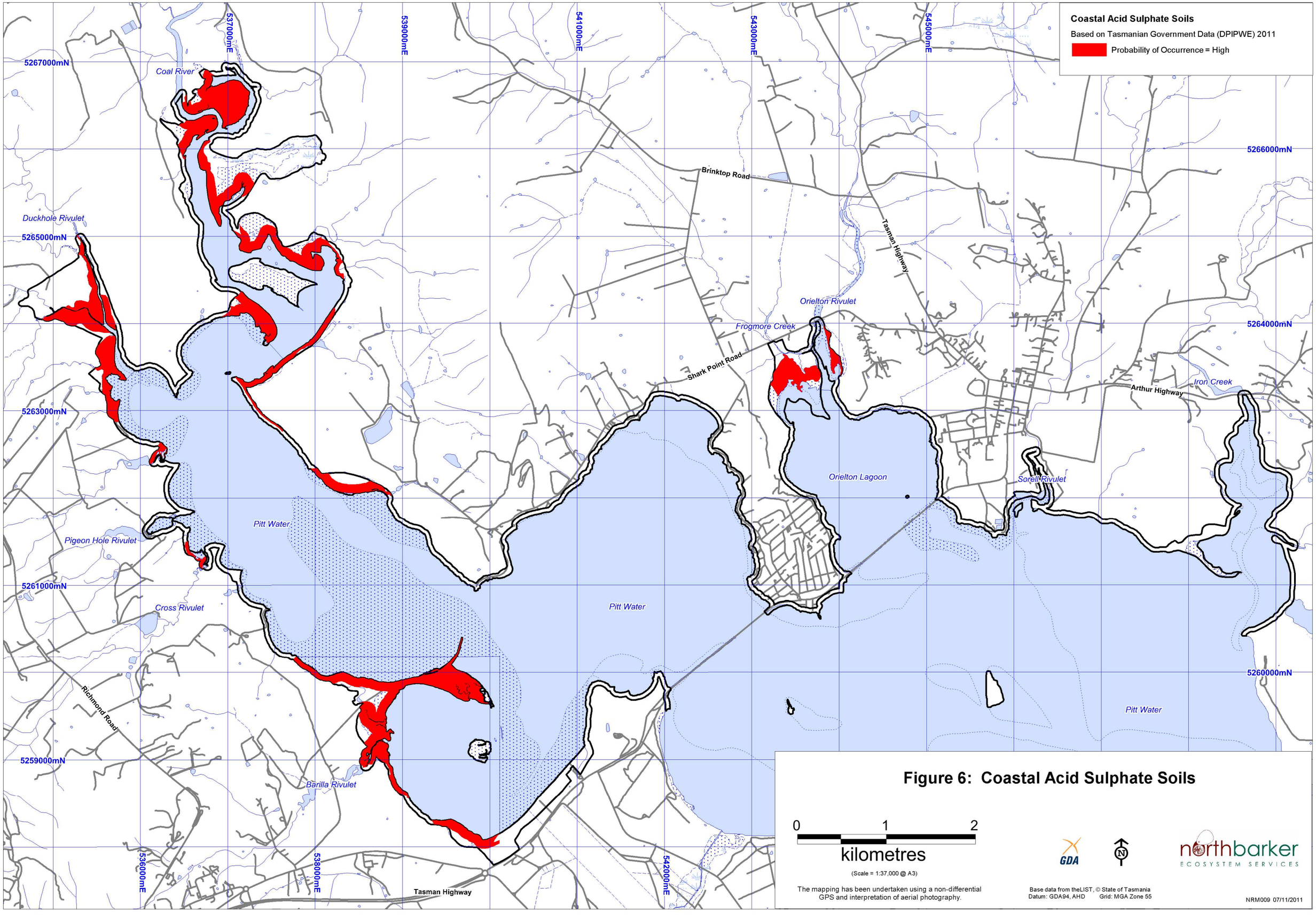

Figure 6: Coastal Acid Sulphate Soils

The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.

Base data from theLIST, © State of Tasmania
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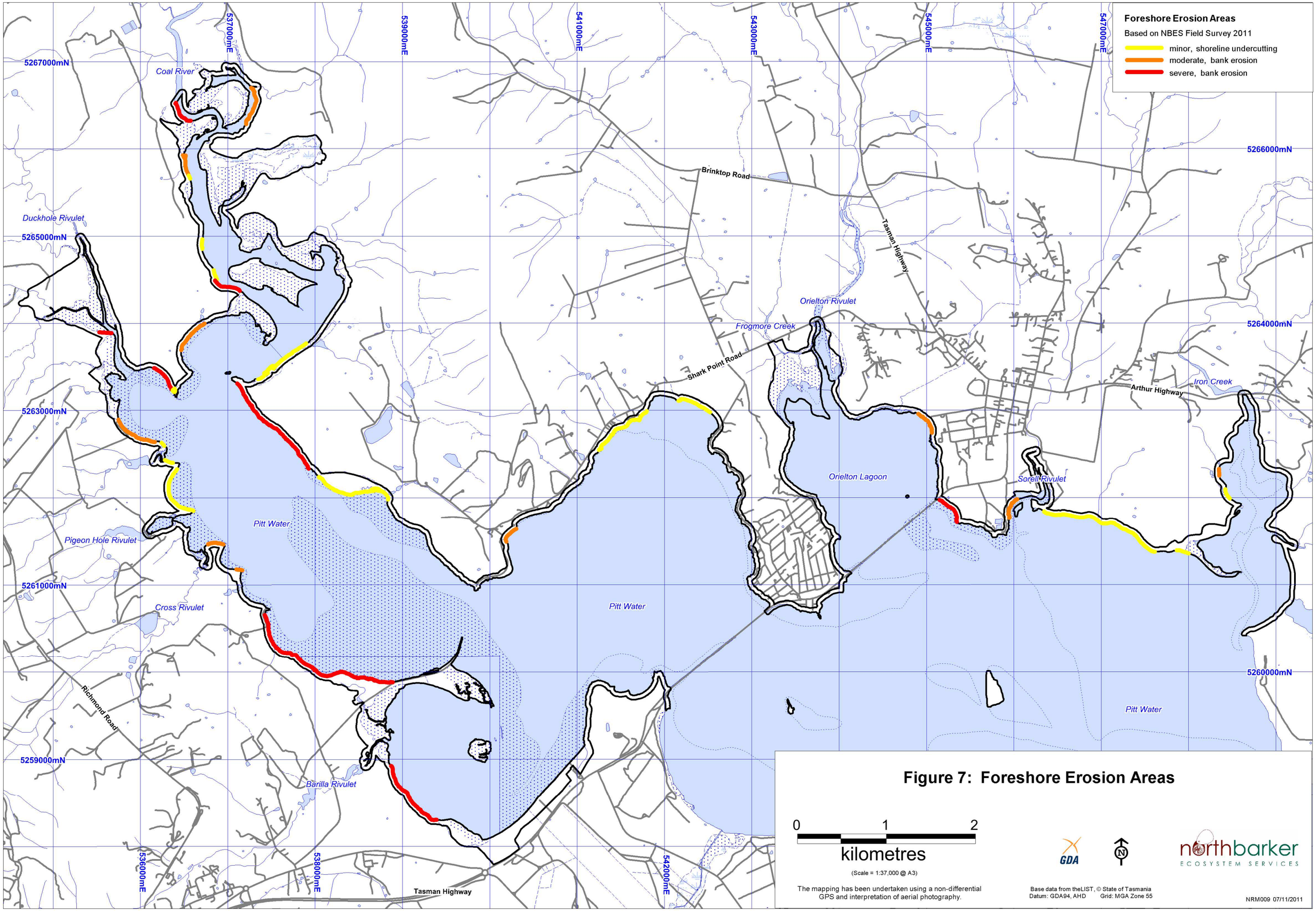

Figure 7: Foreshore Erosion Areas

0 1 2

kilometres

(Scale = 1:37,000 @ A3)

The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.

Base data from theLIST, © State of Tasmania
Datum: GDA94, AHD Grid: MGA Zone 55

GDA

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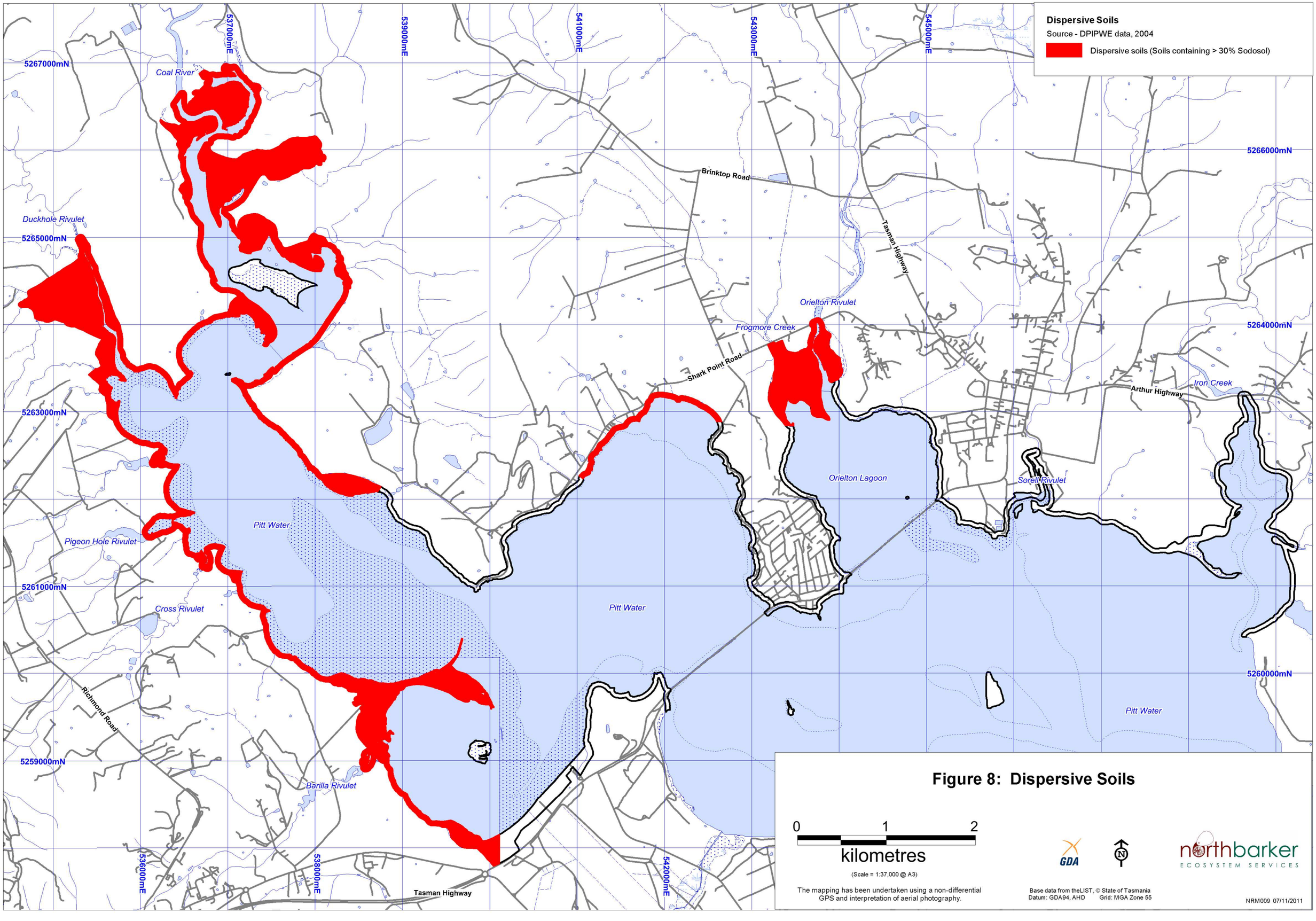
Dispersive Soils
Source - DPIPWE data, 2004
Dispersive soils (Soils containing > 30% Sodosol)
537000mE
539000mE
541000mE
543000mE
545000mE
5267000mN
5266000mN
5265000mN
5264000mN
5263000mN
5261000mN
5260000mN
5259000mN
536000mE
538000mE
542000mE
Coal River
Duckhole Rivulet
Brinktop Road
Tasman Highway
Orielton Rivulet
Frogmore Creek
Shark Point Road
Arthur Highway
Iron Creek
Orielton Lagoon
Sorell Rivulet
Pitt Water
Pigeon Hole Rivulet
Cross Rivulet
Richmond Road
Barilla Rivulet
Tasman Highway
Figure 8: Dispersive Soils
0
1
2
kilometres
(Scale = 1:37,000 @ A3)
The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.
GDA
N
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Base data from theLIST, © State of Tasmania
Datum: GDA94, AHD
Grid: MGA Zone 55
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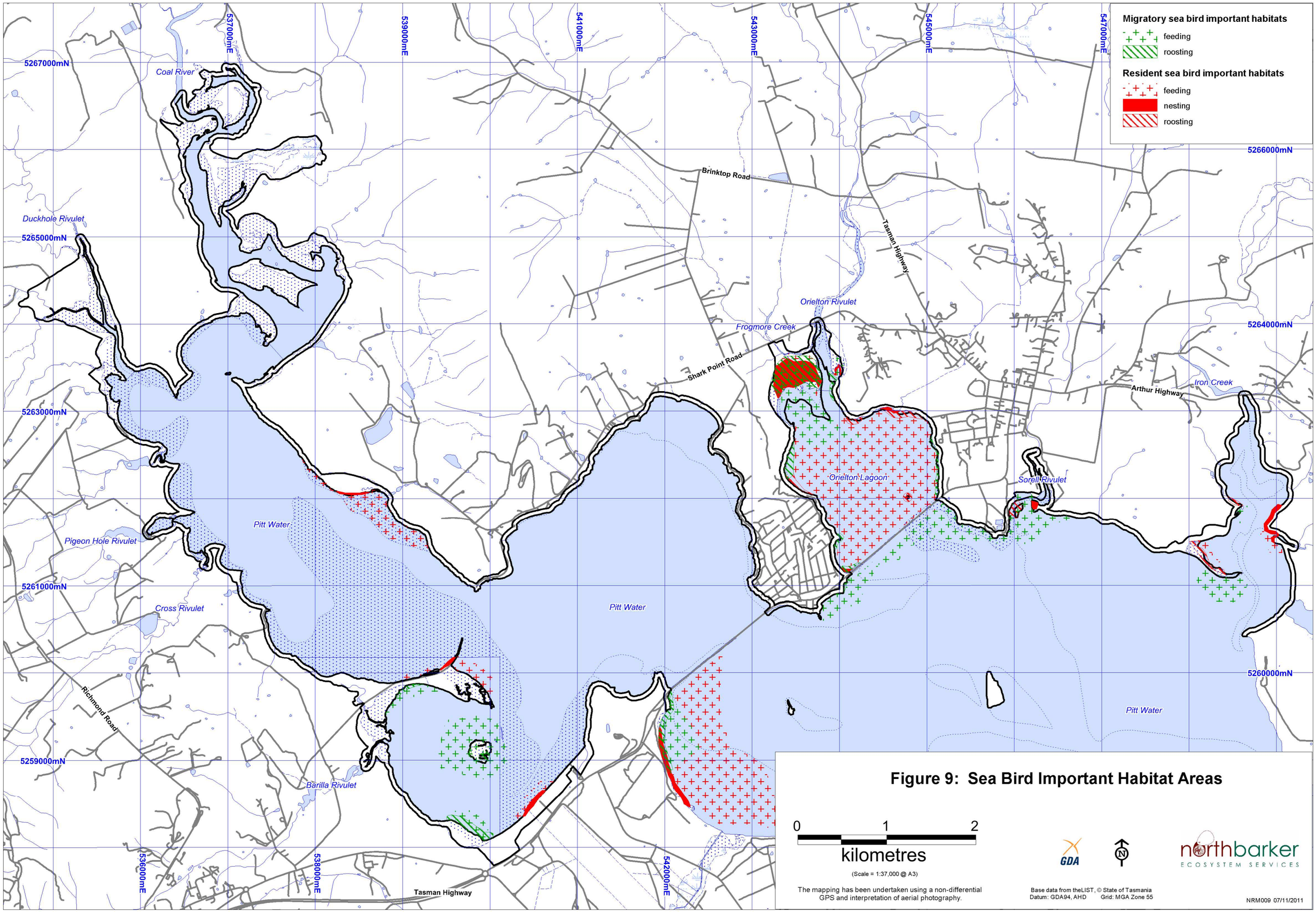

Figure 9: Sea Bird Important Habitat Areas

Threatened Flora - NVA Records

Status (TSPA/EPBCA)

- As - Austrostipa scabra subsp. falcata (pr/)
- Ca - Cynoglossum australe (r/)
- Cc - Calocephalus citreus (r/)
- Ct - Carex tasmanica (/VU)
- Hh - Haloragis heterophylla (r/)
- La - Limonium australe (r/)
- Lp - Lepidium pseudotasmanicum (r/)
- Rs - Ranunculus sessiliflorus var. sessiliflorus (r/)
- Vb - Vittadinia burbidgeae (pr/)
- Vc - Vittadinia cuneata var. cuneata (r/)
- Vg - Vittadinia gracilis (r/)
- Vm - Vittadinia muelleri (pr/)
- Wh - Wilsonia humilis (r/)
- Wr - Wilsonia rotundifolia (r/)

Threatened Flora - NBES Field Survey

Status (TSPA/EPBCA)

- As - Austrostipa scabra (r/)
- Cc - Calocephelus citreus (r/)
- Vc - Vittadinia cuneata (r/)
- Vg - Vittadinia gracilis (r/)
- Vm - Vittadinia muelleri (r/)
- Wh - Wilsonia humilis (r/)
- Wr - Wilsonia rotundifolia (r/)

Threatened Fauna - NVA Records

Status (TSPA/EPBCA)

- CB - Chequered Blue (r/)
- EBB - eastern barred bandicoot (/VU)
- EC - eastern curlew (e/)
- FT - fairy tern (pv/PVU)
- GCG - great crested grebe (v/)
- GGF - green and golden frog (v/VU)
- LBS - live-bearing seastar (pv/PVU)
- MO - masked owl (tasmanian) (e/VU)
- SLM - saltmarsh looper moth (v/)
- TD - tasmanian devil (e/EN)
- TS - tussock skink (v/)
- WBSE - white-bellied sea-eagle (v/)

Figure 10: Threatened Flora and Fauna

0 1 2

kilometres

(Scale = 1:37,000 @ A3)

The mapping has been undertaken using a non-differential GPS and interpretation of aerial photography.

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