

**TOWN OF COTTESLOE  
NATURAL AREAS  
MANAGEMENT PLAN  
ADDENDUM 1**

**TO BE READ WITH 2008 NAMP  
DOCUMENT**

**JUNE 2015**

**FOR  
TOWN OF COTTESLOE**



**SYRINX**  
environmental pl

**Perth**  
12 Monger Street  
PerthWA, Australia 6000  
t +61[0]8 9227 9355  
f +61[0]9 9227 5033

**Melbourne**  
2/26-36 High Street  
Northcote VICAustralia 3070  
t +61[0]3 9481 6288  
f +61[0]3 9481 6299

ABN : 39 092 638 410

[www.syrinx.net.au](http://www.syrinx.net.au)

## SYRINX ENVIRONMENTAL PL REPORT NO. RPT-1512 001 V2

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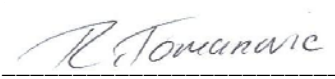
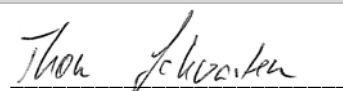
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	Signature		Signature
<b>Author:</b> RT		<b>Reviewer:</b> TS	
<b>Position:</b> Environmental Scientist		<b>Position:</b> Principal – Environmental Restoration	

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## EXECUTIVE SUMMARY

### BACKGROUND AND RATIONALE

In 2008, the Town of Cottesloe appointed Ecoscape Consultants to produce a Natural Areas Management Plan (NAMP) that would outline a management framework for all of the Town's natural areas over a five year period. The Plan identified existing and potential natural areas and prioritised them for management in accordance with environmental, cultural, social and economic values. In addition, the Plan outlined management actions and guidelines for the conservation, restoration and enhancement of natural areas.

Over the past eight years the Town has implemented a number of recommendations from the NAMP in collaboration with the Cottesloe Coastcare Association Inc. (CCA) volunteers. In order to record and assess the success of revegetation works conducted during this period, both the Town and the CCA requested a review and update of the Plan and an audit of restoration activities conducted during this period.

Whilst the NAMP provided strategic recommendations for management of priority natural areas, it did not include detailed baseline vegetation condition data that would allow measurement of any changes as a result of implementing small scale revegetation / restoration works. In addition, the restoration works schedule was not explicit enough to assess past works and guide future restoration works.

As the original NAMP is still relevant and regarded as an overarching natural areas management document, the Town and the CCA have requested that the update takes a form of an addendum to the original document. The main focus of the addendum is the assessment of the current condition of existing natural areas and their prioritisation for restoration and maintenance based on vegetation condition. Development of detailed implementation plans that will guide restoration activities, resourcing and funding applications for future projects was also a key driver to undertake this additional work.

### APPROACH

The methodology utilised to gather information and address the objectives of the study incorporated a combination of desktop information and field assessments. Consultation with the Town and CCA was conducted in March and April 2015 to ensure that the addendum meets requirements of the Town's staff as well as CCA volunteers and achieves the best possible environmental, social and economical outcomes.



## RESULTS

The Town and CCA have used the original NAMP in an effective way to gain external funding for the priority natural areas identified in the NAMP. As a result of restoration works, several natural areas have been improved significantly from an ecological and amenity perspective with particular success achieved in restoration of Grant Marine Park, Mudurup Rocks, Vlamingh Reserve, Bryan Way and Napier Street foredunes, Dutch Inn and Cottesloe Native Gardens. All of these areas have a high proportion of Good to Very Good vegetation as is shown in the figure on the following page.

From a total of approximately 15 ha occupied by natural areas, 59% of is Completely Degraded with no native vegetation and only 27% of the vegetation is in Good – Very Good condition. The remaining 15% is in Degraded condition based on high weed cover, and native plants in small patches (less than 5m<sup>2</sup>) surrounded by a buffer of weeds. Additionally, areas with a mix of indigenous native plantings and plants of Western Australian origin have been mapped as Degraded.

The current plan(s) to develop the foreshore area in Central Cottesloe (i.e. the Foreshore Redevelopment Plan 2012) offer opportunities to further enhance natural habitat of the dunes and extend revegetation works by connecting the already restored areas (areas with Good to Very Good vegetation condition).

Detailed vegetation condition mapping is used as one of the main tools to prioritise areas for restoration and maintenance in this addendum. On the basis of current information, the highest priority for maintenance lies in the areas that are scoring high in vegetation condition assessment (i.e. already restored areas). The highest priority for restoration efforts is placed on sites that provide ecological linkages between already restored sites. The results of the scoring are presented in a figure on page vii.

A set of implementation plans relating to the high priority areas has been prepared as an appendix (Appendix 2) to this document to allow for efficient scheduling and resourcing so that these areas can be restored within the next 3-5 years. This document is submitted with digital maps of vegetation condition and priority weeds to facilitate ease of data access and future assessment of restoration efforts. To assist with funding applications a separate costing spreadsheet is submitted with this document in a digital format.





**Natural Areas Management Plan Addendum 1**  
Overview of Vegetation Condition for Town's Existing Natural Areas

Author: Syrinx Environmental PL  
Job Number: 1512  
Projection: GDA94 MGA Zone 50  
Date: 17 Jun 2015









# PART 1: INTRODUCTION AND METHODOLOGY

## 1.0 BACKGROUND TO THIS REPORT

Syrinx Environmental PL (Syrinx) was commissioned by the Town of Cottesloe (the Town) on 10<sup>th</sup> March 2015 to undertake a review and update of the Town's Natural Area Management Plan (NAMP) written by Ecoscape Australia PL (Ecoscape, 2008) consultants.

The review's objectives were to:

- Update any planning and statutory information such as acts, regulations and guidelines that affect management of natural areas within Town of Cottesloe;
- Provide a baseline data on the condition of natural areas within the Town so that any changes to those areas can be tracked or measured;
- Prioritise restoration and maintenance of natural areas on the basis of updated information and provide rationale behind this rating;
- Provide a practical implementation framework that is pragmatic, clear and has measurable outcomes for the 2015 – 2019 period. This is to include site specific management plans and recommendations for priority Existing Natural Areas (ENAs).

The review and the associated implementation framework act as an addendum to the existing NAMP (Ecoscape, 2008) and do not replace the original document, which is still relevant and largely current.

This addendum outlines the current state of the existing natural areas / reserves within the Town of Cottesloe and identifies management requirements or actions that are deemed necessary to maintain and enhance the condition of these areas. The addendum does not cover 'in detail analysis' of Potential Natural Areas (PNAs) as these have been described in the original NAMP (see section 7.0) and the recommendations and guidelines for enhancing these areas are still valid. Some additional recommendations for these areas are made in this document to complement actions suggested in the original NAMP (Ecoscape, 2008).

To assist with maintenance of existing natural areas and allocate adequate funds and resources for their restoration and management, the 13 existing natural areas identified in the original NAMP document have been segmented into smaller management sites denoted by beach access paths (e.g. S1, C1, N1 etc). This was done to complement the organisation of maintenance activities by the Town's Operations team (see Figure 1 and Figure 2).



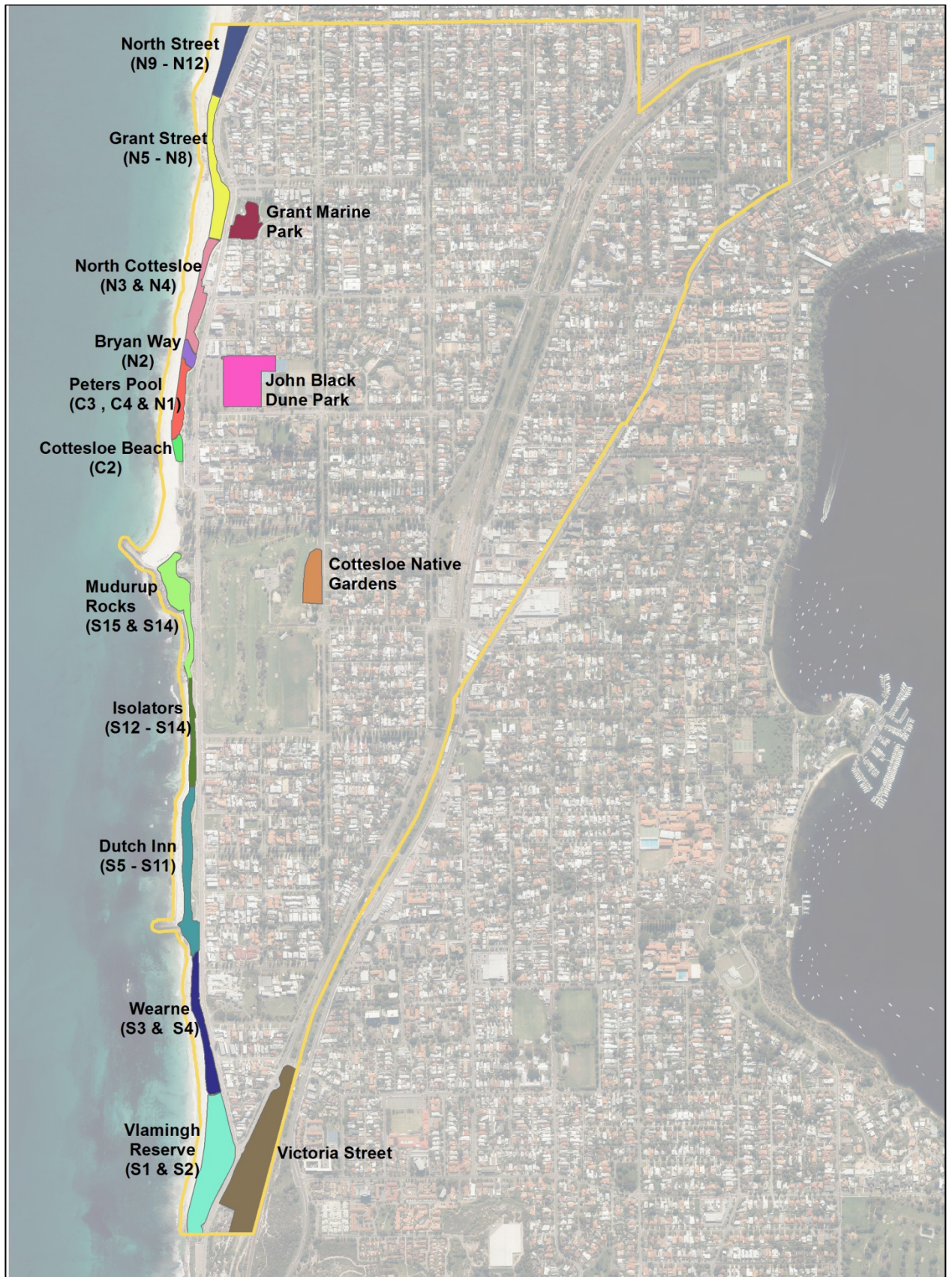


Figure 1 Existing Natural Areas Locations with Management Site Annotations Denoted by Beach Access Path Codes (e.g. S1, S2)





Figure 2 Town of Cottesloe Management Sites denoted by Beach Access Paths

## 2.0 METHODOLOGY

This addendum was developed in four main phases:

- Desktop review;
- Field survey / assessment;
- Consultation with the Town and CCA; and
- Data analysis, costing and reporting.

### 2.1 DESKTOP ASSESSMENT

Desktop assessment involved the review of the existing NAMP (Ecoscape, 2008) and associated documents to identify any changes in statutory requirements at the local state and federal level that affect natural areas management within the Town of Cottesloe.

Data collection involved web searches and review of printed material available from the Town and CCA. CCA had provided information on activities undertaken by volunteers for the 2008 – 2014 period (CCA, 2014). The group have also provided limited information on the activities the Town's Operations team have undertaken to fulfil the requirements of NAMP.

### 2.2 FIELD SURVEY

A field survey was conducted over a three day period in April 2015 by two Environmental Scientists / Botanists. During this survey, all existing natural areas (ENA's) were assessed for vegetation condition and the location of *Leptospermum laevigatum* (Coast Teatree) was also noted and mapped.

The survey involved traversing the areas on foot and visually assessing native vegetation cover, introduced flora cover (i.e. weeds), overall health of vegetation, erosion, or deposition and other management issues (e.g. informal access, trampling, vandalism, litter etc).

It is important to note that only perennial weed species were observable at the time of the survey and as such the annuals and geophytes were not captured in the mapping unless evidence of dry plant material was present (e.g. *Lagurus ovatus* which is an annual grass often remains intact when dry and is easy to identify). A priority weed species list and the location mapping of some of the more aggressive weeds including geophytes and annuals were provided by CCA and this information was used to supplement findings of the survey.

Syrinx has used modified Keighery (1994) vegetation condition scale that includes weed cover class under each condition rating. Note that 'Excellent' and 'Pristine' ratings were not used as very little to no remnant native vegetation is present in the Town's natural areas with

most of the vegetation in Very Good condition being a result of revegetation efforts. Keighery (1994) defines vegetation condition as a measure of an area's similarity to what it would have looked like prior to the effects of disturbance from European settlement in Australia. Given that Cottesloe's natural areas have been subject to long term disturbance, Syrinx has used this scale as a guide only and combined it with weed cover, their invasiveness along with other disturbance aspects to determine final condition rating. A description of ratings used is outlined in Table 1.

**Table 1 Vegetation Condition Scale for Town of Cottesloe Natural Areas**

	Completely Degraded	Degraded	Good	Very Good
<b>Keighery, B.J. (1994)</b>	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
<b>Croft et al (2005) (modified) Native species diversity</b>	0 to 5%	5 to 20%	20-60%	60-100%
<b>Weed species abundance</b>	60-100%	20-60%	5 to 20%	0 to 5%
<b>General Health % plants with significant health problems</b>	>70%	50-70%	30-50%	15-30%
<b>Disturbance Soil and/or substrate disturbance. Such as trampling, tracks, erosion.</b>	Disturbance incidence very high. Affecting 80-100% of the area.	Widespread high level disturbance affecting 60- <80% of the area.	Widespread high level disturbance affecting 40 to <60% of the area.	Generally low-level disturbance. May be high in small patches. Affecting 20 to <40% of the area.

Areas with native Western Australian trees such as *Melaleuca lanceolata* or *Agonis flexuosa* were given a 'Good' status after discussions with the Town and CCA. Although most trees appear to have been planted they may have been present in Cottesloe area in the past. One specimen of *Agonis flexuosa* at the south west boundary of Grant Marine Park appears to be a remnant tree based on old aerial photograph examinations; however, this information is not very reliable.

Small patches of native vegetation surrounded by aggressive weeds have been mapped as Degraded as was the case with individual shrubs of *Olearia axillaris*, *Scaevola crassifolia* or *Spinifex longifolius* in most cases with heavy cover of *\*Tetragonia decumbens* (Sea Spinach) or *\*Pelargonium capitatum* (Rose Pelargonium or Pelargonium) (\* denotes weed species).



Similarly, recently restored areas showing significant weed cover were also mapped as Degraded because of the uncertainty involved with the level of establishment of the newly installed seedlings. Small seedlings are more susceptible to climatic changes and can easily perish resulting in poor vegetation cover and diversity and overall reduction in vegetation condition rating. Otherwise, native vegetation was mapped as either Good or Very Good. Any turf areas within the boundary of natural areas have been given a Completely Degraded condition rating as the condition rating refers to native vegetation only.

The identity and distribution of native vegetation and weeds across the study area was recorded to the species level where possible. Some planted or exotic trees and shrubs could not be identified to species level but this was not considered detrimental to condition mapping or proposed restoration actions. No botanical records or specimen collections were made for either native or non native species with the exception of Sea Wheatgrass (*\*Thinopyrum distichum*) which was identified at the herbarium via CCA. This specimen was not vouchered.

Restoration sites were examined to evaluate past works and suggest supplementary works where required.

All point records were taken using a Garmin GPS. Field maps with aerial photographs were used to draw polygons indicating species or condition of vegetation for later digitising in ArcGIS (10.3.1) software.

### 2.3 CONSULTATION

Two formal (start up meeting in March 2015 and progress meeting in April 2015) and one informal meeting (site meeting in April) were held with the Town and CCA representatives so they could provide feedback into what are considered important inclusions into the addendum. Most of the comments related to the implementation plan for restoration areas and the subsequent maintenance requirements and procedures. The consensus was to produce a succinct document that is easy to follow and implement and that prioritises and defines key management outcomes for each natural area with clear delineation of roles and responsibilities of CCA volunteers and the Town's Operations Team.

### 2.4 DATA ANALYSIS

Data collected in the field was digitised in Arc GIS 10.1.3 by forming polygons around specific features (e.g. *Leptospermum laevigatum* tree canopy or patches of native vegetation). Each polygon was given specific attributes including:

- **Location** (Natural area location as defined in the existing NAMP e.g. North Street, Grant Marine Park, Cottesloe Native gardens etc);
- **TOC\_ID - Town of Cottesloe Area ID** (in reference to the beach access numbers. e.g. area north of access path N9 is Management Site N9);
- **Area (m<sup>2</sup>)** (Calculated in GIS);
- **Vegetation Condition** (rating: Completely Degraded – Very Good);
- **Notes** Species name (if singular species) or mix of species;
- **Type** (native or Weed or Native).

A set of maps showing vegetation condition for the 13 Management Areas identified in NAMP is presented in Appendix 1.

Where vegetation was not easy to discern because of the high encroachment of weeds (e.g. *Pelargonium capitatum* in North Street Precinct), a note on the overall native vegetation cover within a drawn polygon was made in line with Standard Vegetation assessment descriptions (e.g. Very scattered *Spinifex longifolius* with *Pelargonium*, Couch and Beach Evening Primrose). Syrinx has used common names for weed species for the ease of interpretation by maintenance teams as well as the limitations in the number of characters that can be entered in GIS database.

During the survey, locations and distribution of several other weeds were recorded separately. These include *Agave americana*, *Acacia longifolia* and *Schinus terebinthifolius*. Areas with *Pelargonium*, *Euphorbia*, *Gazania*, Marram Grass and Sea Wheatgrass were extracted from the general dataset as separate digital files (shapefiles or KML files) so they can be viewed on demand for management planning. Additional mapping provided by CCA included Black Flag, *Lachenalia* sp. Carnation Weed, Freesia, Bridal Creeper, Bearded Oat and Veldt Grass locations and these have also been included in the final data set submitted with this addendum. Data for Couch was not extracted as this weed is prevalent throughout.

Further data analysis included quantification of areas for restoration and the extrapolation of costs associated with revegetation and maintenance activities. The cost analysis is submitted electronically (Excel spreadsheet) as an attachment to this addendum for use by Town's Planning and Operations teams. The costs are approximate only and take into consideration higher levels of maintenance than is currently offered for natural areas.

#### **2.4.1 Prioritisation of Areas for Restoration**

The prioritisation process outlined in NAMP (Ecoscape 2008) had used Social, Business, Biodiversity, and Integrity Values to prioritise management of natural areas.

In general, the assessment of natural areas for management and conservation relies on a set of rules outlined in the Perth Biodiversity Project (PBP) Local Government Biodiversity Planning Guidelines 2004 (PBP, 2004) and they are as follows:

- Vegetation condition;
- Reserve size;
- Shape of the natural area or reserve;
- Perimeter to area ratio;
- Connectivity; and
- Visibility/Community involvement.

Syrinx has used a combination of selection criteria above, the PBP Environmental Planning Tool (accessed from <http://pbp.walga.asn.au/Tools/EnvironmentalPlanningTool.aspx>) and the criteria outlined in NAMP to prioritise existing natural areas for management based on the findings of the current survey (April 2015).

#### **2.4.2 *Leptospermum laevigatum* (Coast Teatree) Mapping**

Mapping of this species was conducted using a current aerial photograph (August 2014, provided by the Town) and the GPS unit to denote locations of each tree or clump of trees.

As the growth of this species is dense, and shrub like with branches touching the ground, it was difficult to establish the exact number of plants at each location. For this reason, the overall tree canopy cover (as seen on the recent aerial photograph) was mapped and the height of the tree/s given where applicable. Where small individual specimens were encountered, the exact number of trees was recorded.

In general most trees growing on primary dunes are stunted with broad crowns and are shrub like and no taller than 1 - 2.5m). In contrast, trees planted behind primary dunes particularly at Cottesloe Native Gardens, Vlamingh Reserve and Victoria Street are very large with some trees reaching a trunk diameter of 30cm or more correlating with the age of the trees some of which have been planted over 80 years ago. Almost all trees are between 3 – 5 m in height.

The number of seedlings for Coast Teatree was low to nonexistent in most areas where trees were cleared. Exceptions were cleared areas within Victoria Street Reserve adjacent to the railway line, where a high level of soil disturbance occurred due to infill activities. The map of Coast Teatree distribution is presented as an overlay on Vegetation condition maps in Appendix 1.

### 2.4.3 Monetary Value of Natural Areas / Assets

Although not explicitly required in the original scope, during the consultation process the Town expressed the desire to use a consistent approach within the asset management framework and define the value of natural areas. The purpose of this exercise would be to justify the funds required for maintenance of natural areas and ensure that the Town allocates adequate resources for this task in the future.

Currently, there is no recognised or standard methodology for determining the monetary value of natural areas despite the recognised benefits natural ecosystems (or assets) provide. Quantification of the value of natural areas and defining the replacement cost for such areas is an emerging science. Some councils resort to using an approach similar to the valuation of built assets (with recognised national standards) to estimate the replacement value of their natural areas.

A considerable effort is required in analysing data across different sectors within the Town to be able to estimate the value of natural assets as the analysis needs to consider ecosystem diversity, catchment analysis and business and recreational use. Added to this complexity are the heritage values attached to the natural assets and it is not clear how these could be valued appropriately.

In the absence of a standard methodology for valuing natural area assets, Syrinx has not put a monetary figure to any assets, as their value in an ecological sense is very high from a local and regional perspective. The estimate of the cost of restoration for currently degraded natural areas supplied as an Excel spreadsheet with this document can be used only as an indication of the monetary value of any particular site.

The Town should proceed to develop a suitable methodology in line with the built asset valuation which will recognise or determine the real value of natural assets, which underpin the environment, community well being, amenity, and economy of the Town.

Recent survey data for development of the Foreshore Development Plan as well as asset valuation figures for built structures will be able to assist Town in this validation.

In terms of setting **budgets** aside for **maintenance of natural areas** depending on the type of / size of the restoration / revegetation project, the maintenance budget is usually **7 – 10% of capital cost in year 1**, with reduced maintenance costs for the following years as native vegetation establishes. Contingency plans for any adverse conditions should be made (e.g. climate, vandalism, unskilled labour, etc.). As a general rule a minimum 2 – 3 year intensive maintenance program post restoration activities should be budgeted for to ensure the success of the restoration.



## PART 2: ASSESSMENT FINDINGS

### 3.0 CHANGES TO LEGISLATIVE FRAMEWORK

In general, very little has changed in terms of statutory / legislative requirements pertaining to Town's natural areas conservation and management. Text below identifies changes from a local, regional and national perspective.

#### 3.1 LOCAL CONTEXT

##### 3.1.1 Local Planning Scheme No. 3 (LPS No.3)

Under the new LPS (gazetted in 2014) all of the existing natural areas are vested under Parks and Recreation, which was the case with the previous LPS. The Metropolitan Region Scheme (MRS) remains unchanged and is congruent with the new LPS.

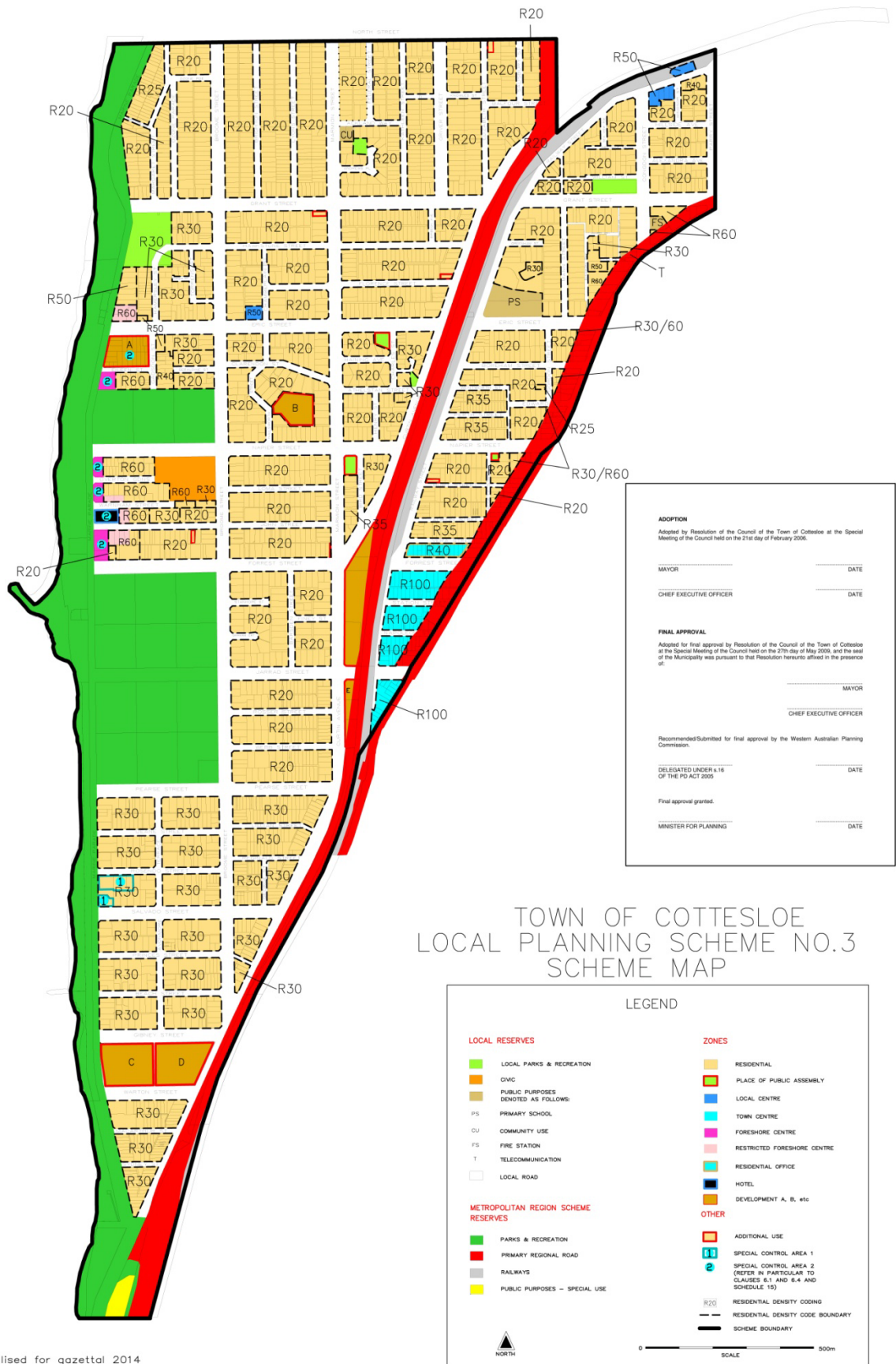
Main changes in the LPS outline updated land use distribution within the Town particularly concerning Town Centre, Foreshore Development and Local Centres (Figure 3).

Section 10.2.2 outlines several clauses in relevance to protection of natural areas from the development perspective most relevant being that:

*“the local government is to have due regard to such of the following matters as are in the opinion of the local government relevant to the use or development the subject of the application” —*

*(e) the likely effect of the proposal on the natural environment and any means that are proposed to protect or to mitigate impacts on the natural environment.*

**TOWN OF COTTESLOE NATURAL AREAS  
MANAGEMENT PLAN - ADDENDUM 1**



As finalised for gazettal 2014

**Figure 3 Landuse within the Town of Cottesloe based on LPS No. 3 (2014)**

### 3.1.2 Strategic Community Plan (2013 – 2023)

This document was produced as a requirement under the State Government's Integrated Planning Framework to assist with future community needs planning in the short to medium term. The Plan allows the community to set priorities and objectives for Council to achieve over a ten year period. Specific to natural areas management are following:

Council's mission:

*...”To preserve and improve Cottesloe’s natural and built environment and beach lifestyle by using sustainable strategies”.....and the Plan’s six interrelated priorities all of which directly relate to natural areas management:*

1. Protecting and enhancing the wellbeing of residents and visitors;
2. Achieving connectivity between east and west Cottesloe;
3. Enhancing beach access and the foreshore;
4. Managing development;
5. Providing sustainable infrastructure and community amenities; and
6. Providing open and accountable local government.

The plan recognises the fragility of dune environment and the need to use a sensitive approach to cause least environmental damage with any development occurring within or near beach areas. The strategies to achieve the objectives or priorities listed in the Plan include implementation of NAMP and improvement to dune conservation outside the central foreshore area. The Plan lists as a main / current priority and focus the implementation of the Foreshore Redevelopment Plan.

### 3.1.3 Cottesloe Foreshore Redevelopment Plan (2012)

This plan is one of the major redevelopment works planned for the Town in the short to medium term and providing opportunities for dune restoration in the central precinct. The plan recognises the need for substantial resources to *“intensify and upgrade landscaping”* not only on the promenade but also the dune areas. Additional to the foreshore dunes, John Black Dune Park is proposed for landscaping and redevelopment to accommodate the increase in car park capacity by extending west of the current carpark.

### 3.1.4 Town of Cottesloe Human Enhanced Climate Change Policy (2011)

Whilst the policy does not discuss natural areas within the Town, the policy aims to reduce greenhouse emissions and states that *“The Town will become a carbon neutral Council, achieving zero net greenhouse gas emissions, by the year 2015, or as soon as is*

*practicable*". One of the ways to reduce greenhouse gasses is to increase green cover, and as such would be relevant to protection and enhancement of natural areas.

### 3.1.5 Native Plant Subsidy Scheme

Although not a part of a statutory documentation, the Native Plant Subsidy Scheme shows a positive step towards improving the biodiversity and amenity value of the areas leading to or adjacent to natural areas. Town of Cottesloe provides Town's residents with the opportunity to purchase subsidised native seedlings from APACE nursery between May 4<sup>th</sup> – May 30<sup>th</sup> each year (limit of 80 seedlings per household). While the Town indicates this scheme is successful, Syrinx did not obtain quantitative data to show the overall trend in plant sales (increasing or decreasing) and the success of the verge plantings done by residents.

## 3.2 REGIONAL CONTEXT

### 3.2.1 Directions 2031 and Beyond and Central Metropolitan Perth sub-regional Strategy

"Directions 2031" is a high level strategic plan and spatial framework that establishes a vision for the future growth of the metropolitan Perth and Peel region. The Central Metropolitan Perth sub-regional strategy recognises the complexity of strategic planning for the metropolitan area and provides the opportunity to guide planning at the local level. A strategic priority of these documents that directly relates to NAMP is to:

*"Protect our natural and built environments and scarce resources; respond to social change and optimise the land use and transport conditions that create vibrant, accessible, healthy and adaptable communities."*

This priority recognises the importance of strategic planning integrating the key environmental principles of environmental protection, natural resource management and sustainability for the Town of Cottesloe.

## 3.3 STATE CONTEXT

### 3.3.1 Biosecurity and Agriculture Management Act 2007 (BAM Act) - enacted May 2013

In addition to declared plants under the Agriculture and Related Resources Act 1976 (ARRPA), BAM Act has been enacted to:

- prevent new animal and plant pests (vermin and weeds) and diseases from entering Western Australia;

- manage the impact and spread of those pests already present in the State;
- safely manage the use of agricultural and veterinary chemicals; and
- ensure that agricultural products are not contaminated by chemical residues.

The Western Australian Organism List (WAOL) details the status of 'pest' organisms into four main classifications:

- Declared pests (section 22);
- Permitted (section 11);
- Prohibited (section 12); and
- Permitted Requiring a permit (73, BAM Regulations 2013).

Under the BAM Act, all declared pests are placed in one of three categories, including:

- C1 (exclusion);
- C2 (eradication); or
- C3 (management).

This act is relevant to the Town's natural area management as weeds with C3 category management requirements are found within the existing natural areas and potential natural areas (e.g. \**Tamarix aphylla* and \**Asparagus asparagoides*).

### 3.3.2 Weed Prioritisation Process for DPaW – November 2013

The Environmental Weed Strategy of Western Australia (EWSWA) (1999) described in the NAMP provided a ranking of weed species on a state-wide basis against three criteria – invasiveness, distribution and environmental impacts. This ranking at the state level was considered too broad to be of use from an on-ground operational perspective in particular areas of the state. Hence, DPaW has updated the priority rankings in 2008 and 2013 based on a species led approach for several regions in Western Australia. The resulting priorities focus on weeds considered to be high impact, rapidly invasive and still at a population size that can feasibly be eradicated or contained to a manageable size. This means that weed species that are already widespread are not ranked as a high priority. The Weed prioritisation process relevant to Town of Cottesloe is outlined in the Swan NRM region prioritisation rankings summary. This prioritisation serves as a guide to weed management overall. It is up to each natural area manager / Council to determine the priority for control of particular weeds in their area.

### **3.4 FEDERAL CONTEXT**

#### **3.4.1 Australia's Biodiversity Conservation Strategy 2010-2030**

This Strategy provides the framework for the conservation of Australia's biodiversity. Given that the Town does not have a Biodiversity Plan this document is referred to as an overarching document together with the Western Suburbs Greening Plan (described in NAMP).

#### **3.4.2 Environmental Protection and Biodiversity Conservation Act, 1999 (EPBC Act)**

The EPBC Act is a statutory document that allows Australian Government to protect matters of national environmental significance. The flora and fauna species and the associated habitats listed under the EPBC Act need to be conserved and protected.

A search of the Protected Matters Search Tool shows a number of species (see Appendix 3) including migratory birds as possibly residing or using habitats available within the Town's natural areas. Whilst the scope of this document focuses on vegetation quality and therefore habitat quality, further investigation into likelihood of the species identified in the search residing in natural areas has not been done and should be attempted in the future.

No conservation significant flora species have been observed during the survey and it is unlikely they would occur in the area due to the high level of weed invasion and extensive degradation of natural areas.

### **4.0 AUDIT OF ACTIVITIES CONDUCTED FOR 2008 – 2015 PERIOD**

The audit of activities conducted to improve the condition of natural areas since the publishing of the original NAMP document was conducted by CCA (see Appendix 4). The audit shows that as a result of NAMP, work occurred in several high priority areas, and with the help of CCA has helped attract significant external financial contribution for the Town during the 2008 – 2013 period. Key achievements include:

- Substantial increase in native vegetation cover and diversity as a result of planting approximately 15,000 plants and the increase in planted natural areas by approximately 3000m<sup>2</sup> (this excludes verge areas within the Town);
- Reduction in weed cover for several natural areas particularly Bryan Way and Napier foredunes;



- Improved beach access safety and amenity value through built structures (access ramps and fencing at Napier Street dunes and limestone retaining walls at Mudurup Rocks).

A comparison between 2006 and 2014 aerial photographs for Vlamingh Reserve and Grant Marine Park Cottesloe Native Gardens shows some of the changes that have occurred as a result of previous and 2008 – 2014 works is shown in Figure 4.



**Figure 4 Aerial imagery of three sites showing changes in native vegetation cover and distribution (Source: Landgate, 2006 and Town of Cottesloe, 2014)**

In addition to natural areas, several verge areas have been planted by Town's Operations team most notable being:

- Salvado Road garden beds;



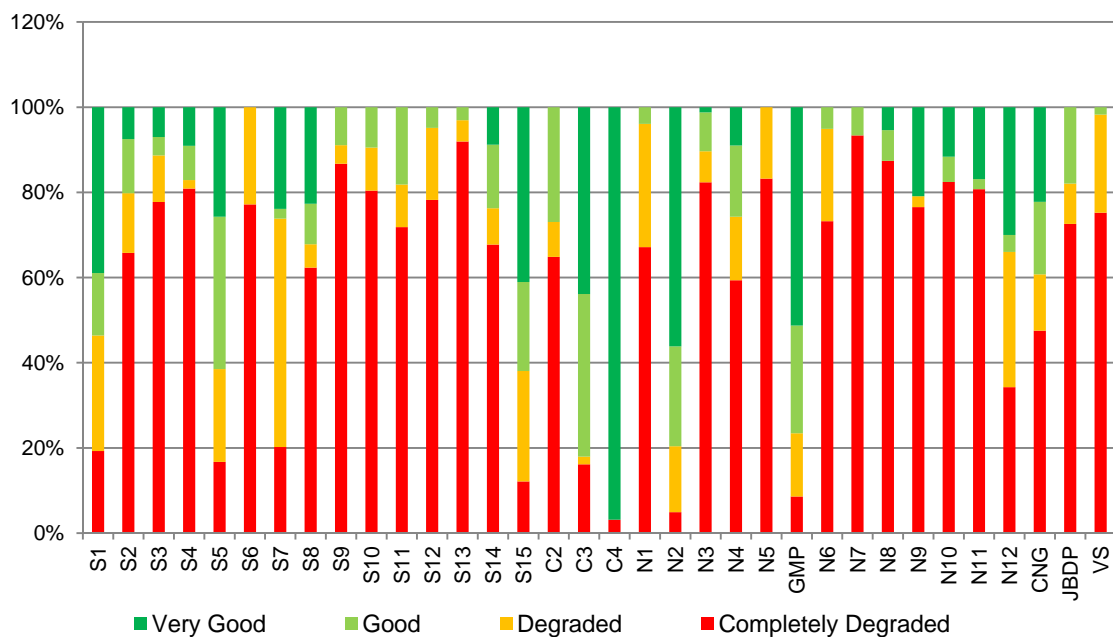
- Two swales or 'sumps' on Grant Street (one at the western end of Grant Street and second near the intersection of Grant Street with Marmion Avenue).

Other smaller verge garden beds were planted on Eric Street and Albion St near Cottesloe Railway Station; however, the individual areas are too small to make a large impact or quantify well in this document.

## 5.0 FIELD INVESTIGATION FINDINGS

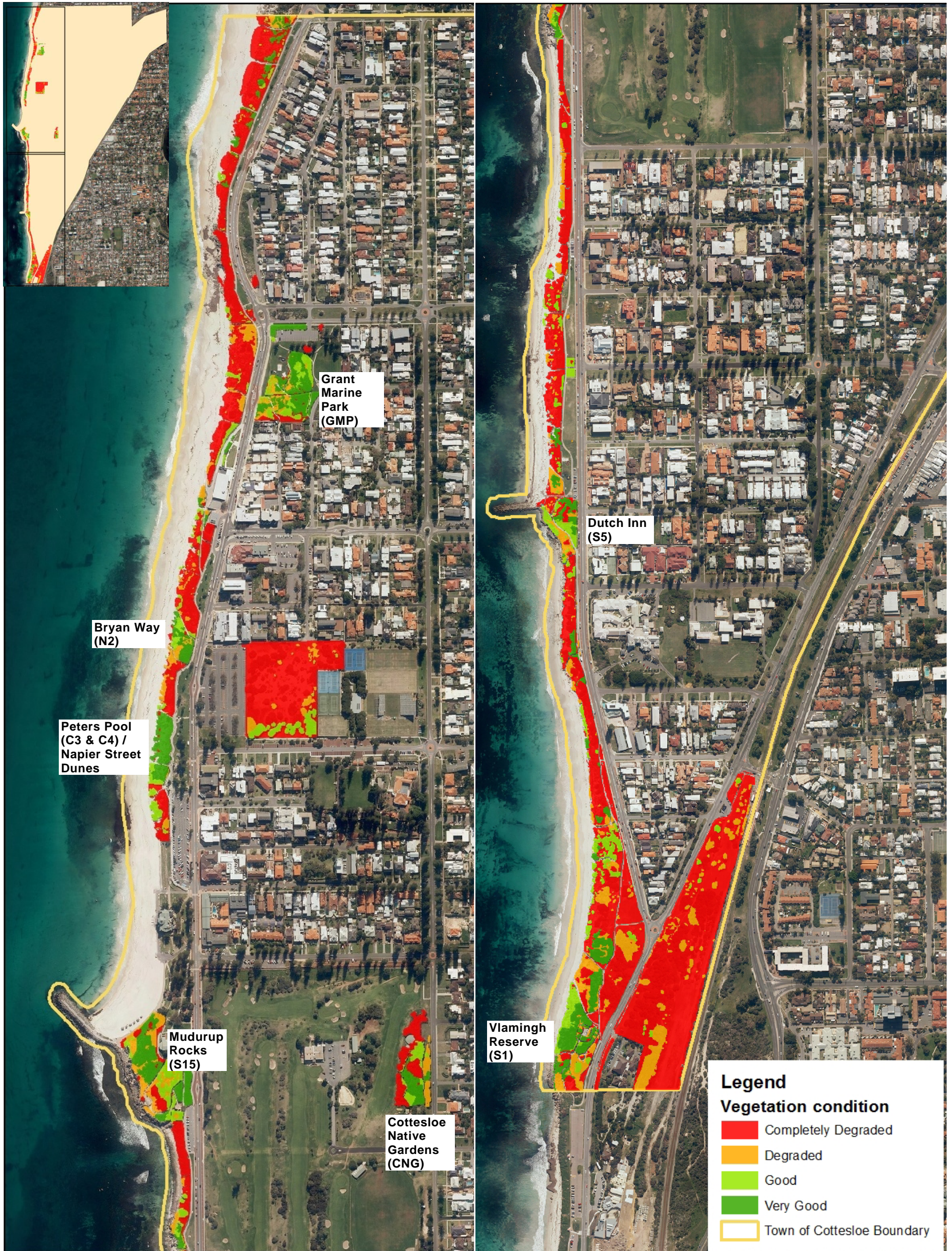
### 5.1 VEGETATION CONDITION

Vegetation condition varied across all sites and is reflective of efforts invested in revegetation of particular areas since 2008. From a total of approximately 15 ha occupied by natural areas (as shown in Figure 1), 59% is Completely Degraded with no native vegetation and only 27% of vegetation is in Good – Very Good condition. The remaining 15% is in Degraded condition based on high weed cover and native plants in small patches (less than 5m<sup>2</sup>) surrounded by a buffer of weeds. Additionally, areas with a mix of indigenous native plantings and plants of Western Australian origin have been also mapped as Degraded. The graph showing vegetation condition by percentage vegetation cover for all existing natural areas within the Town is provided in Figure 5 and the same result is presented graphically in Figure 6



**Figure 5 Current vegetation condition for existing natural areas within the Town of Cottesloe**





Natural Areas Management Plan Addendum 1

Overview of Vegetation Condition for Town's Existing Natural Areas

Author: Syrinx Environmental PL  
Job Number: 1512  
Projection: GDA94 MGA Zone 50  
Date: 17 Jun 2015



Figure 6 Vegetation condition of Town of Cottesloe Existing Natural Areas



From the sites shown, Peters Pool Area (also known as Napier Street Dunes C3 and C4), Grant Marine Park, Mudurup Rocks (S15), Vlamingh (S1 and S2) and Dutch Inn (S5) show high level of vegetation that is in Good – Very Good condition. The vegetation condition in these areas could further improve through weed management and supplementary planting.

Areas that show highest level of vegetation in Completely Degraded condition are the rocky cliffs covered in Sea Spinach (*\*Tetragonia decumbens*) and Couch (*\*Cynodon dactylon*), and Victoria Street and John Black Dune Park that have a substantial Coast Teatree (*\*Leptospermum laevigatum*) infestations.

## 5.2 WEEDS

The weed cover is very high overall with almost all sites being affected by one or several weeds. The sites with least weed cover also had the best vegetation condition thus the vegetation condition graph is representative of weed cover as well.

Most dominant weeds along the foreshore are Sea Spinach (*\*Tetragonia decumbens*) followed by Pelargonium (*\*Pelargonium capitatum*). Marram Grass (*\*Ammophila arenaria*) and Sea Wheatgrass (*\*Thinopyrum distichum*) which was not recorded in the original NAMP.

In the swales and the primary dunes Couch (*\*Cynodon dactylon*) is the most prevalent weed together with Kikuyu (*\*Cenchrus clandestinus*) or Buffalo grass (*\*Stenotaphrum secundatum*) and in the Southern section of the coast *\*Gazania linearis*. Of woody weeds Coast Teatree (*\*Leptospermum laevigatum*) is most dominant particularly in the Town's southern precinct, Cottesloe Native Gardens, John Black Dune Park and Victoria Street.

Couch and other lawn grasses are problematic as the Town maintains a lawn edge close to natural vegetation along most of the foreshore reserve. Creating a barrier between the lawn and native vegetation is essential to reduce maintenance costs. For this reason, all revegetation works should consider planting of native vegetation to Dual Use Pathway on the ocean side of the path and lawn can then be maintained on the road side of the path. A significant improvement to the condition of vegetation has occurred to the south east of Grant Marine Park where planting was extended to the road kerb and Couch was gradually eradicated. Regular follow-up weed control helps keep this particular weed under control.

### 5.2.1 Weed Prioritisation

The review of the Town of Cottesloe Weed lists shows that

- *\*Tamarix aphylla* and
- *\*Asparagus asparagoides*

are Weeds of National Significance (WONS). They are also WAOL listed declared weeds (under BAM Act) classed as requiring C3 (management). This means that the species listed are established pests in Western Australia and that it is feasible to implement management actions in order to limit their damage to the environment. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area that is currently is free of that pest.

No *\*Tamarix aphylla* trees occur within the existing natural areas although one tree is present close to the edge of Grant Marine Park natural area and several trees are found within Cottesloe Golf Course adjacent to Cottesloe Native Gardens. Other trees are found within the Railway Reserve (proposed natural area). As such they do not pose a significant problem for maintenance and restoration efforts but plans should be in place to action their replacement in the medium to long term with a more suitable preferably native species (e.g. Tuart (*Eucalyptus gomphocephala*)). Any young *\*Tamarix aphylla* seedlings that are observed during maintenance activities should be removed immediately.

Bridal Creeper (*\*Asparagus asparagoides*) is found within Vlamingh Reserve and should be controlled in the short term.

No weeds found in the Town of Cottesloe are listed under Agriculture and Related Resources Act 1976 (ARRPA).

The updated ranking based on DPaW's Swan NRM Weed Prioritisation Process is provided in Appendix 5 alongside priority weed locations. The new rankings are based on the manageability of each weed species and the consequences or the risk of not doing so. While the table is useful it is not mandatory and each local government authority can rate its priority weeds based on the impact they are having on the local environment.

Explanation of ratings and examples of management (indicated in brackets in the table) are also provided in Appendix 5. Species listed in Table 2 below were ranked as having High priority for management in Town's natural areas based on DPaW ranking and the ranking devised by the Town and the CCA.



**Table 2 High Priority Weeds for the Town of Cottesloe Natural Areas**

<b>Species name</b>	<b>Common name</b>
<i>Acacia longifolia</i>	Sydney Golden Wattle
<i>Asparagus asparagoides</i>	Bridal Creeper
<i>Cynodon dactylon</i>	Couch
<i>Ehrharta calycina</i>	Perennial Veldt Grass
<i>Ehrharta brevifolia</i>	Annual Veldt Grass
<i>Euphorbia paralias</i>	Sea Spurge
<i>Euphorbia terracina</i>	Geraldton Carnation Weed
<i>Ferraria crispa</i>	Black Flag
<i>Freesia alba x leichtlinii</i>	Freesia
<i>Gazania linearis</i>	Gazania
<i>Lachenalia reflexa</i>	Yellow Soldiers
<i>Lachenalia bulbifera</i>	Red Soldiers
<i>Leptospermum laevigatum</i>	Coast Tea Tree
<i>Lupinus angustifolius</i>	Narrow-Leaf lupin
<i>Lupinus cosentinii</i>	Blue Lupin
<i>Pelargonium capitatum</i>	Rose Pelargonium
<i>Cenchrus clandestinus</i>	Kikuyu
<i>Pennisetum setaceum</i>	fountain grass
<i>Schinus terebinthifolius</i>	Brazilian pepper
<i>Tetragonia decumbens</i>	Sea Spinach
<i>Trachyandra divaricata</i>	Dune Onion Weed
<i>Watsonia meriana</i>	Wild Watsonia

The matrix of priority weed species by each high priority maintenance site is provided in Appendix 6. This matrix can be used in addition to site specific information provided in Appendix 2 to help plan and manage weeds in an efficient and economically viable manner and provides options for control as well as the optimum times for control. Distribution / location of priority weeds within each high priority management area is outlined in Appendix 2.

## **6.0 PRIORITISING NATURAL AREAS FOR MANAGEMENT**

After consultation with the Town and the CCA it was decided that for the ease of implementing restoration works, each natural area or section (defined by beach access pathways) should be prioritised in terms of need for:

1. Maintenance; and
2. Restoration / Capital works.

Prior to finalising prioritisation with these two aims, prioritisation of natural areas was completed from an ecological perspective on a regional and local level.

## 6.1 PRIORITISATION OF TOWN'S NATURAL AREAS ON A REGIONAL SCALE

To start off the prioritisation process purely from an ecological perspective several layers of information were investigated in accordance with the prioritisation framework outlined by the Perth Biodiversity Project. Environmental Planning Tool developed by the PBP was used to prioritise natural areas within the Town as outlined in Figure 7.

The criteria considered in Figure 5 included regional representation of vegetation communities at a local and regional level, rarity, maintenance of ecological processes via connectivity and protection of coastal vegetation. The figure indicates that the score for Victoria Street is high based on its position in relevance to nearby remnant bushland to the east. For similar reasons, secondary dune of Grant Marine Park and John Black Dune Park also score higher than the primary dune vegetation. While Cottesloe Native Gardens was not included in the analysis, it would score high at a local level based on the diverse remnant vegetation as well as its position between the coast and Mosman Bay. Its small size and distance from other remnant natural area fragments does not incorporate this site for analysis on a regional scale.

It has already been acknowledged in the NAMP that coastal strip itself forms a part of a significant regional linkage due to its contiguity in a north to south direction and that east – west linkages should be enforced via street landscaping and development of potential natural areas.

Priority for restoration based on this assessment and from a regional perspective should be given to:

1. Peters Pool area - C3-N2;
2. Grant Marine Park and Grant Street Area - (N6);
3. North of Grant Street - (N12 and N11 in particular);
4. South of Mudurup rocks - (S14);
5. South of Dutch Inn - (S1-S4);
6. Northern and Southern end of John Black Dune Park (to provide linkages with Peters Pool area); and
7. Victoria Station.



## **6.2 PRIORITISATION OF TOWN'S NATURAL AREAS ON A LOCAL SCALE**

Prioritisation of Town's natural areas at a local level is based on vegetation condition as a primary measure followed by a range of other attributes outlined in the original NAMP. Following sites are selected as Priority 1 sites based solely on Vegetation condition:

- |                             |          |
|-----------------------------|----------|
| 1. Peters Pool              | C3 - C4; |
| 2. Bryan Way Dune           | N2;      |
| 3. Grant Marine Park        | GMP;     |
| 4. Mudurup Rocks            | S15;     |
| 5. Dutch Inn                | S5;      |
| 6. Vlamingh Reserve         | S1;      |
| 7. North Street             | N12;     |
| 8. Cottesloe Native Gardens | CNG.     |

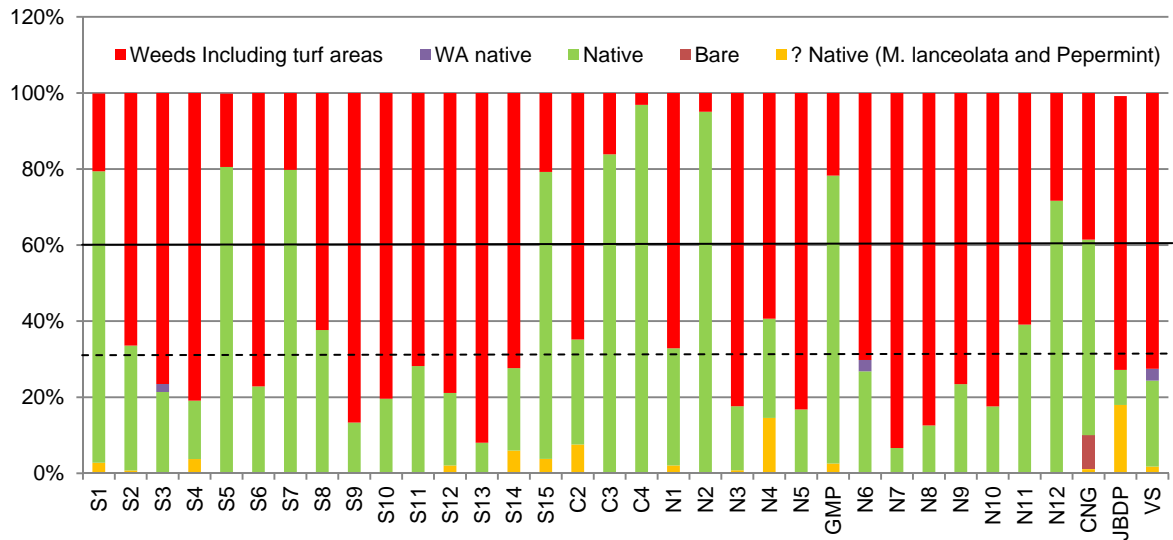
Areas adjacent to Priority 1 areas are usually given Priority 2 status unless those sites pose restoration problems (e.g. sites with 100% weed cover, difficult terrain, and high level of infrastructure or development / planning constraints).

### **6.2.1 Prioritisation from the implementation perspective**

Maintenance works are usually conducted in the areas that have been revegetated or worked on in the past. In contrast, restoration works focus mostly on new areas or areas that have been worked on in the past but have a weed cover greater than 30%.

Any sites showing less than 30% weed cover and more than 60% native cover should be maintained via regular weed control, supplementary planting and or low level erosion stabilisation works. The graph presented in Figure 8 shows areas that have less than 30% weed cover (denoted by dashed line) and are suitable for maintenance rather than full restoration activities. This ranking is congruent with vegetation condition ranking.





**Figure 8 Weed cover by percentage area for the Town of Cottesloe Natural Areas**

When taking the above rules of weed native vegetation ratio, consideration needs to be given to the type of weeds and the site topography. Given natural areas in the Town’s southern precinct have a high infestation of Coast Teatree and steep sites; a combination of restoration and maintenance activities is required. A summary of high priority sites for maintenance and restoration of Town’s natural areas is given in Table 3.

**Table 3 Priority Natural Areas for Maintenance and Restoration**

NAMP Precinct	NAMP Management Area	Management Site	MAINTENANCE Priority	RESTORATION Priority
Central	Peters Pool	C3	High	Low
	Peters Pool	C4	High	Low
	Peters Pool	N1	Medium	High
	Bryan Way Foredune	N2	High	Medium
	Cottesloe Native Gardens	CNG	High	Medium
Northern	Grant Marine Park	GMP	High	Medium
	North Cottesloe	N3	Low	High
	North Cottesloe	N4	Medium	High
	North Street	N12	High	High
Southern	Vlamingh Reserve	S1	High	High
	Dutch Inn	S5	High	High
	Dutch Inn	S7	High	High
	Mudurup Rocks	S15	High	High

The overall prioritisation of sites outlined in Table 3 is presented graphically in Figure 9.

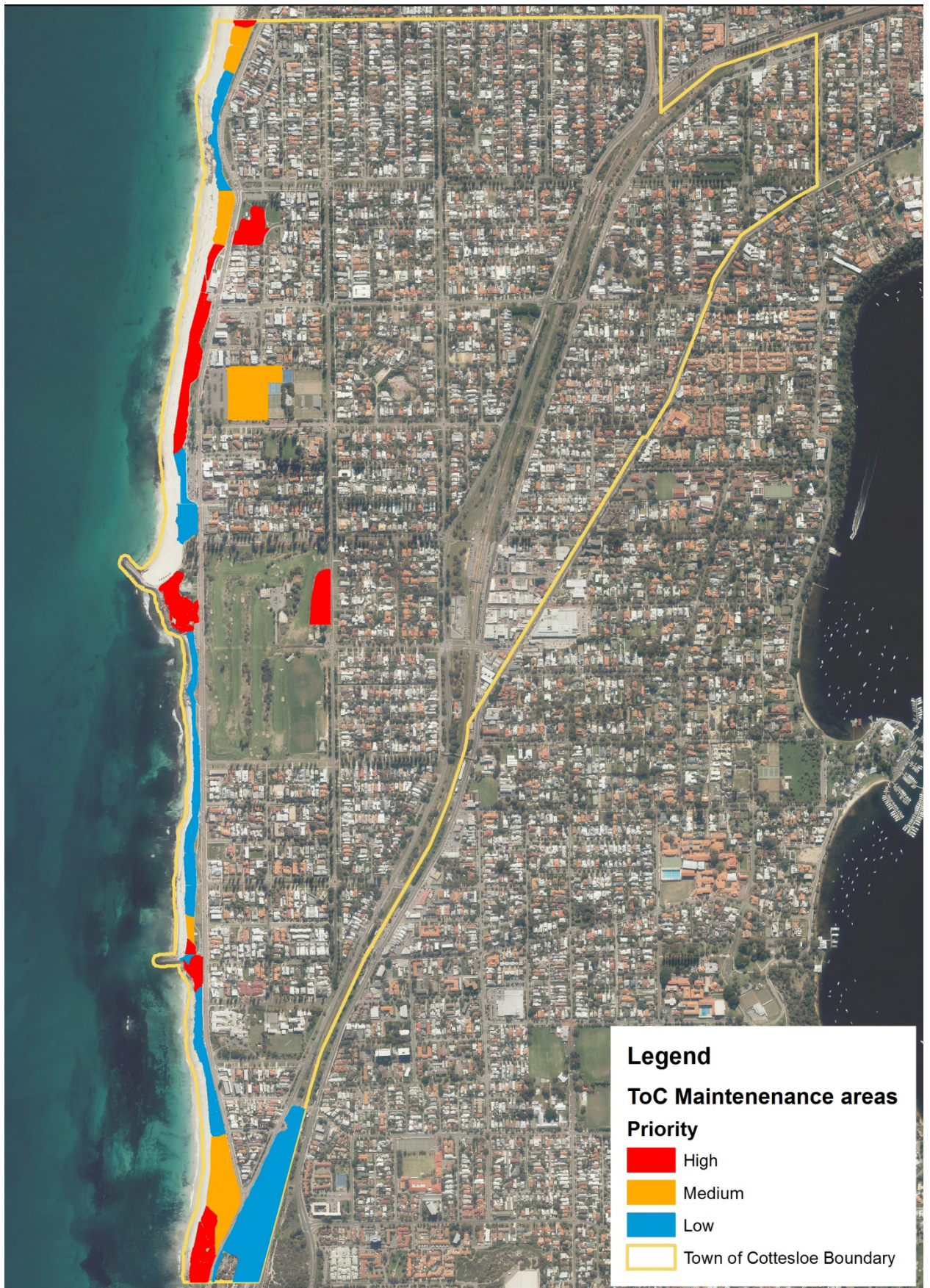


Figure 9 Prioritisation of Town of Cottesloe Natural Areas for Management



## PART 3: IMPLEMENTATION PLAN

To facilitate management of Town's natural areas and to allocate annual budgets with greater certainty, Syrinx has addressed each priority management site as denoted by access pathways. A summary table indicating condition of each priority site as well costs for restoration and maintenance activities are provided in a digital format so that the Town can make relevant adjustments to calculations in the future for all areas. It is important to note that the restoration costs are order of magnitude costs and that more detailed analysis should be done for each site prior to grant applications / proposed works. This is especially necessary for limestone cliff areas that will require geotechnical stability studies to be undertaken to ensure that the proposed restoration works will be effective without further degrading the existing shoreline.

Each of the High Priority sites identified in previous section (see Table 3) has a site specific management and implementation plan outlined in Appendix 2. Each site plan outlines the basic baseline data for that site and the changes that have occurred in each area between 2008 – 2014. Also, a separate page with implementation actions is presented to assist with planning and implementation of maintenance and restoration works.

### 7.0 KEY ACTIONS ACROSS ALL EXISTING NATURAL AREAS

Following key actions should apply to all existing natural areas particularly priority areas to ensure that all restoration activities are conducted from an ecological, amenity and maintenance efficacy perspective.

#### When **restoring** an area:

1. Ensure adequate effort has been spent on site preparation. This includes in most cases at least two rounds of chemical spray, one round of manual weed removal (if native vegetation is present) and weed matting (also known as jute matting). Site preparation will depend on the level of disturbance, location within the landscape (elevation) and in the case of Cottesloe Native Gardens site removal of woody weeds such as *Leptospermum laevigatum*.
2. Use only materials that are biodegradable and will not impact the natural environment in a negative way.
3. Do not start woody weed control on dunes unless adequate measures are in place to protect the bare soils prior to revegetation (e.g. wind fencing, matting, brushing or similar) or planting itself.

4. Always plan for contingencies – while good organisation helps deliver restoration projects of a high standard, climate change and vandalism can be major contributors to the lack of success. Install temporary fencing or arrange for additional watering during the first year of restoration. Consider costs of doing these things and not doing them. Conduct fencing replacement and repair works prior to planting and after removal of woody weeds.
5. Ensure that diverse list of species appropriate to the specific location is used (refer to original NAMP document for a list) and in view of long term dune stability. Consult with CCA volunteers with regards to appropriate species.
6. Plant to enhance views and interest of the public whilst keeping the ‘natural appearance of the landscape (e.g. do not plant tall / large shrubs near the pathway and avoid even, geometric landscaping style planting).
7. Ensure that maintenance activities are easy to conduct – e.g. do not plant native garden beds directly adjacent to lawns or major / frequently used service access points.
8. Install access ramps that are in line with the natural environment (i.e. preferably made of natural materials). Use of metal should be avoided. Also, consider that dogs use access ramps and hence their design should prevent dog entry to dune vegetation along the access way and be suitable for dogs to use / climb.
9. Consider different bollards / permanent border edging. Current bollards serve as seating areas; hence, natural vegetation is impacted. Position of benches needs to consider views, shade and ample access (e.g. large prams should be easy to navigate around the bench) to avoid native vegetation damage. Cottesloe can develop its own trademark bollards / fencing that is functional and complementary to the natural environment.
10. Consider viewing vistas for surfers and general public This may need the installation of specific elevated viewing platforms or seating areas so that natural vegetation is not impacted.





When **maintaining** an area:

1. Ensure adequate time and funding is set aside for maintenance. The funds required are usually 7 – 10% of capital costs / costs of restoration for the first year. The funds can then be reduced accordingly for the following years.
2. Perform maintenance in a timely manner – this is particularly important with weed control – it is a waste of time to spray annual grasses that have already set seed.
3. Control priority weeds first BUT always consider other weeds as well as extra time set aside for this can make a big difference over a long period of time and does not translate to significant costs.
4. Avoid the use of weedy herb and shrub species on verges and median strips (e.g. do not plant *Gazania* sp.).
5. Regularly monitor maintenance areas to keep on top of maintenance responsibilities and develop contingency plans. CCA volunteers can assist the Town with monitoring activities particularly with regards to weeds.
6. Group maintenance areas in accordance to their need for weed control to reduce mobilisation costs and use time more efficiently.
7. Ensure adequate water supply is available to help seedlings establish in the first year after restoration. This task could be completed with the help of CCA volunteers.

## 8.0 KEY ACTIONS ACROSS POTENTIAL NATURAL AREAS

Following are the additional actions to those presented in NAMP:

1. Avoid planting additional Norfolk Pines in the areas that have majority of native vegetation – e.g. Railway Reserve south of Jarrad St Intersection with Curtin Avenue
2. Avoid planting *Calistemon* spp. (Bottlebrush shrubs and trees – they can become weedy in the future).
3. Plan for native garden beds around existing natural vegetation nodes – e.g. areas with remnant Grass Trees.
4. Plant demonstration gardens on train station access routes – ensure they are diverse (use only species indigenous to the area) and well maintained.
5. Work in large blocks rather than several fragmented smaller gardens as these take more time to maintain.
6. Gibney Street south side is the prime site for natural verge landscaping. No Norfolk Pines should be planted on this verge particularly east of Avonmore Terrace. Additional native species including Tuart could be added to complement existing Tuart tree. CCA can assist with the species list selection and planting that is most appropriate to the site.

The *Acacia rostellifera* thicket at the end of Avonmore Terrace should be maintained so it is free of dead material. *Melaleuca* species growing along the fence should be replaced with *Banksia sessilis* (ParrotBush). **Note:** Tuart trees can be grown to the Australian Standard AS2303:2015 to provide a high amenity street tree. The Town should explore this option for use of this tree in potential natural areas.

7. Consider options for stormwater treatment where the potential natural area offers opportunities for this. John Black Dune Park provides opportunities to store and infiltrate some or all of the carpark water runoff. This would aid mitigation of stormwater runoff to foreshore areas.

## 9.0 MONITORING AND REVIEW

The completed revegetation and restoration works should be assessed annually (each September) to provide an overall short term success rate based on a number of proposed criteria:

- More than 60% of planted stock survived (for each species planted);
- 80% or planted species diversity represented (i.e. if ten different species were used for revegetation we expect eight species to be established);
- Abundance is similar to that present in the already vegetated or remnant natural areas. As a general rule a minimum of 2 – 3 plants for shrubs and 4 plants for herbs sedges and rushes (depending on location: less dense planting is present along primary dunes);
- Any changes to the priority weed species list and their distribution and abundance will be presented so that plans can be made for targeted weed control in line with recommendations provided in the NAMP (Ecoscape 2008). Depending on the budget available, Syrinx recommends a quarterly weed control regime including four Glyphosate and one grass selective herbicide application (five applications), particularly during first two years of establishment. In addition to chemical weed control, manual removal is also recommended to minimise the chance of the spray drift affecting the plants and to control woody weeds.

In the past, the focus of weed control was often on high priority weeds. However, with a minor increase in effort and cost, some priority natural areas that have small patches of medium and low priority weeds should also be controlled at the same time to improve the overall condition of the planted area. This is particularly possible for small defined restoration patches or planted verges / garden beds.



## 10.0 KEY PERFORMANCE INDICATORS (KPI'S)

The vegetation condition survey is to be undertaken at each location in 4 years time and compared against 2015 survey to assess the overall condition. Assessment should be done at the end of March or beginning of April to allow for a full comparison. Following key performance indicators will serve as an indication of the successful revegetation / rehabilitation efforts:

1. Percentage increase in good quality vegetation.
2. Reduction in the number of high priority weeds.
3. Reduction in feral animals / feral animal activity (rabbits (rats were also observed at Cottesloe Native Gardens) (i.e. no plant damage / diggings or excreta noted).
4. Reduction in use of old and creation of new informal access pathways.
5. No leaky drainage outlets on the slopes particularly in North Cottesloe Area.
6. Increase in funds for management of restored areas.

## REFERENCES

CCA (2014) Town of Cottesloe Natural Areas Management Plan 2008-2013: Strategy Audit And Update Proposal. Informal report for Town of Cottesloe

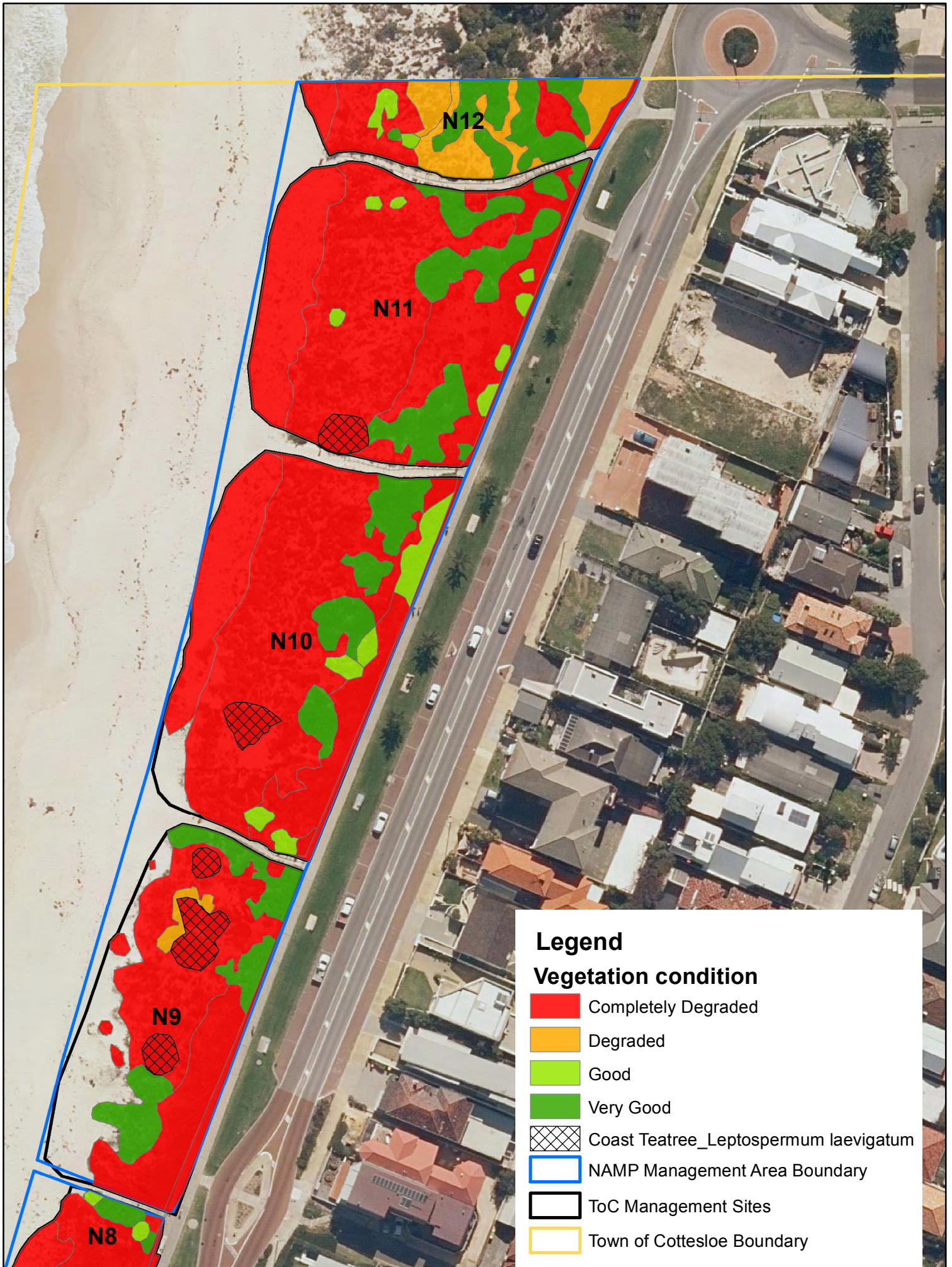
Ecoscope (2008) Cottesloe Natural Areas Management Plan – Final. Technical Report for Town of Cottesloe, 22<sup>nd</sup> September 2008.

Keighery, B.J. (1994) Bushland Plant Survey. Wildflower Society of Western Australia.

## APPENDICES



**Appendix 1 Vegetation Condition and Coast Teatree Maps for NAPM Existing Natural Areas**



**Legend**

**Vegetation condition**

- Completely Degraded
- Degraded
- Good
- Very Good
- Coast Teatree\_ *Leptospermum laevigatum*
- NAMP Management Area Boundary
- ToC Management Sites
- Town of Cottesloe Boundary



**Natural Areas Management Plan Addendum 1**

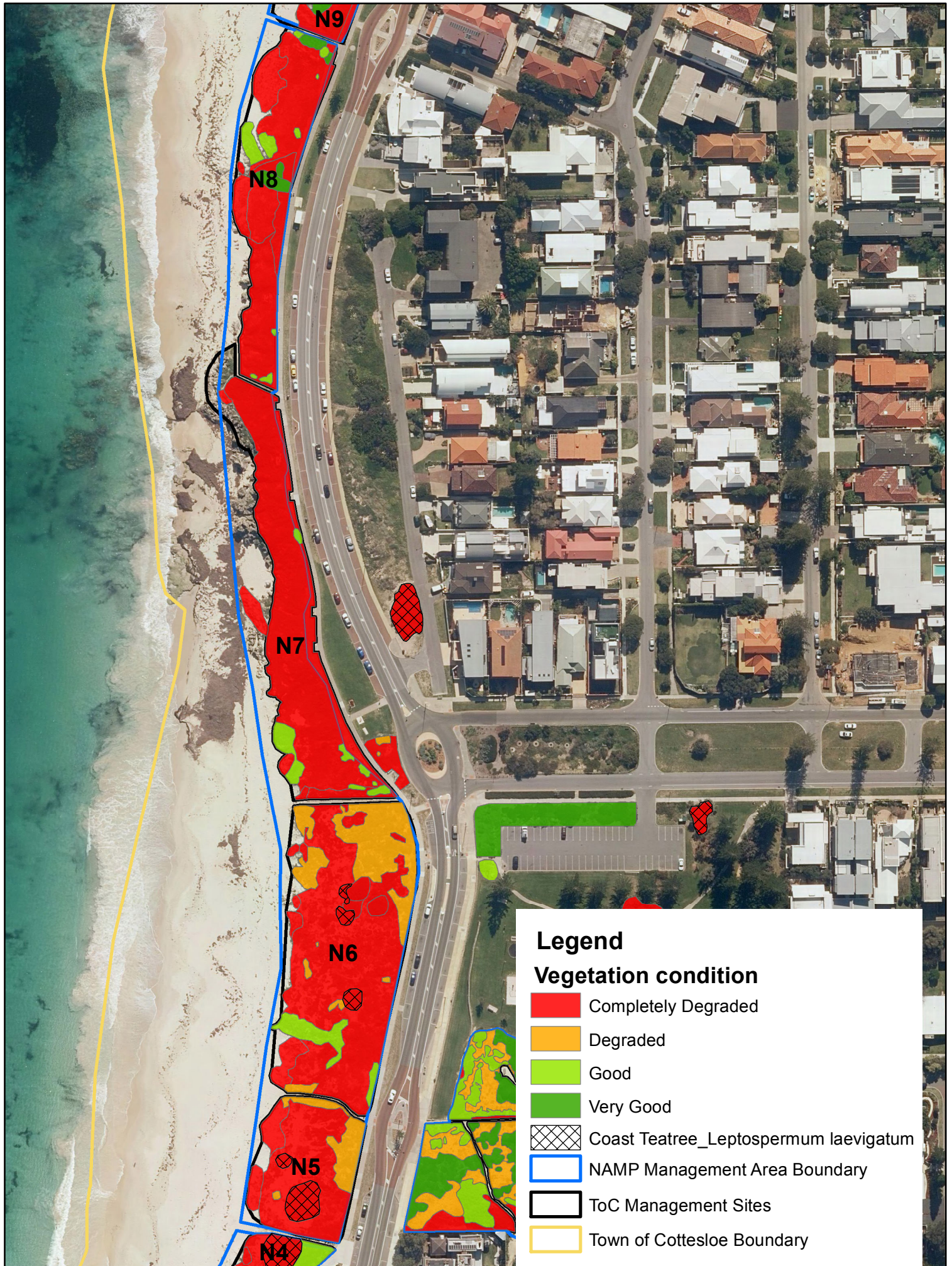
NORTH STREET (N9 - N12)

Vegetation Condition and Coast Teatree Map

Author: Syrnix Environmental PL  
 Job Number: 1512  
 Projection: GDA94 MGA Zone 50  
 Date: 29 Jun 2015





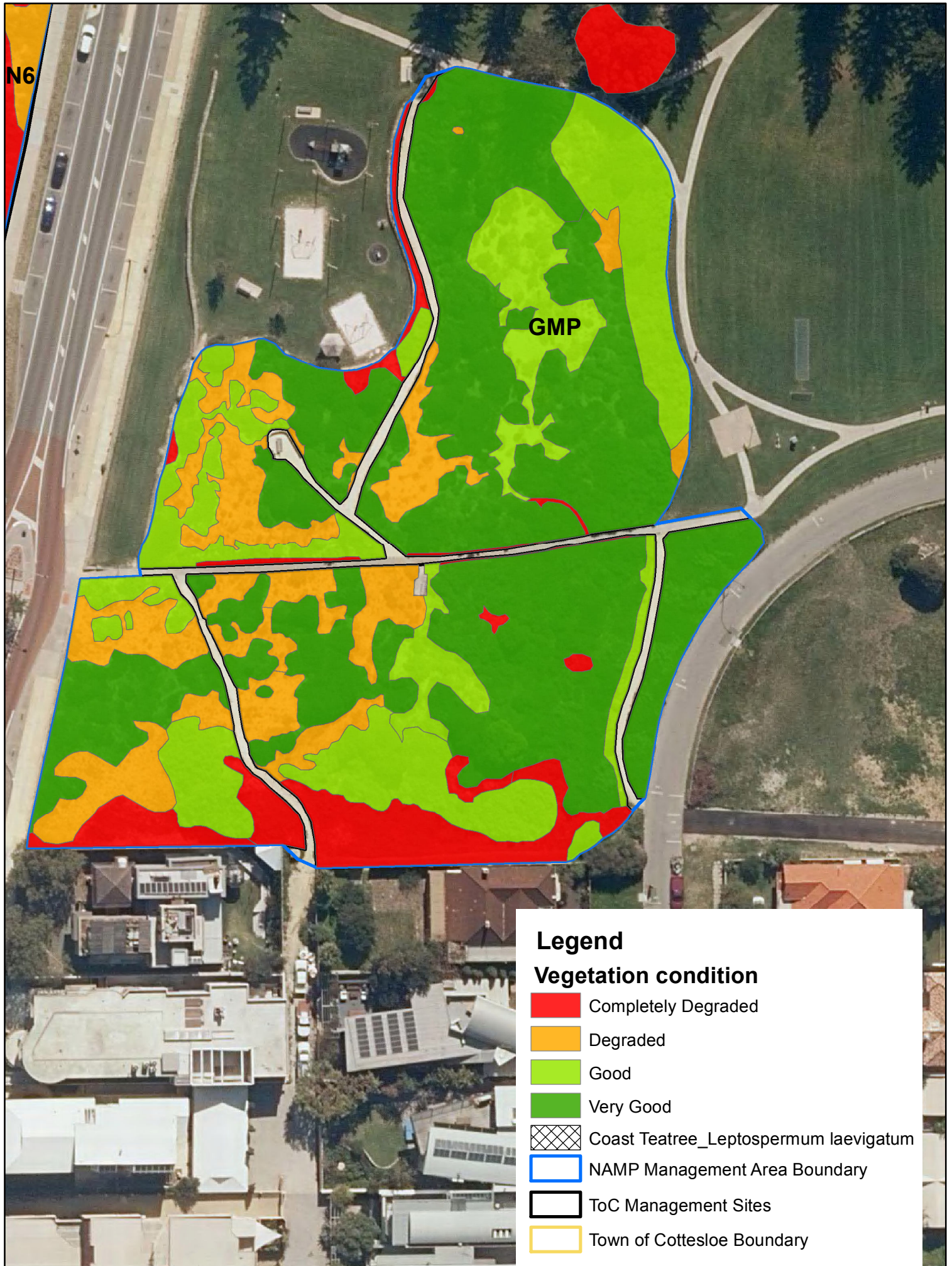


**Legend**

**Vegetation condition**

- Completely Degraded
- Degraded
- Good
- Very Good
- Coast Teatree *Leptospermum laevigatum*
- NAMP Management Area Boundary
- ToC Management Sites
- Town of Cottesloe Boundary





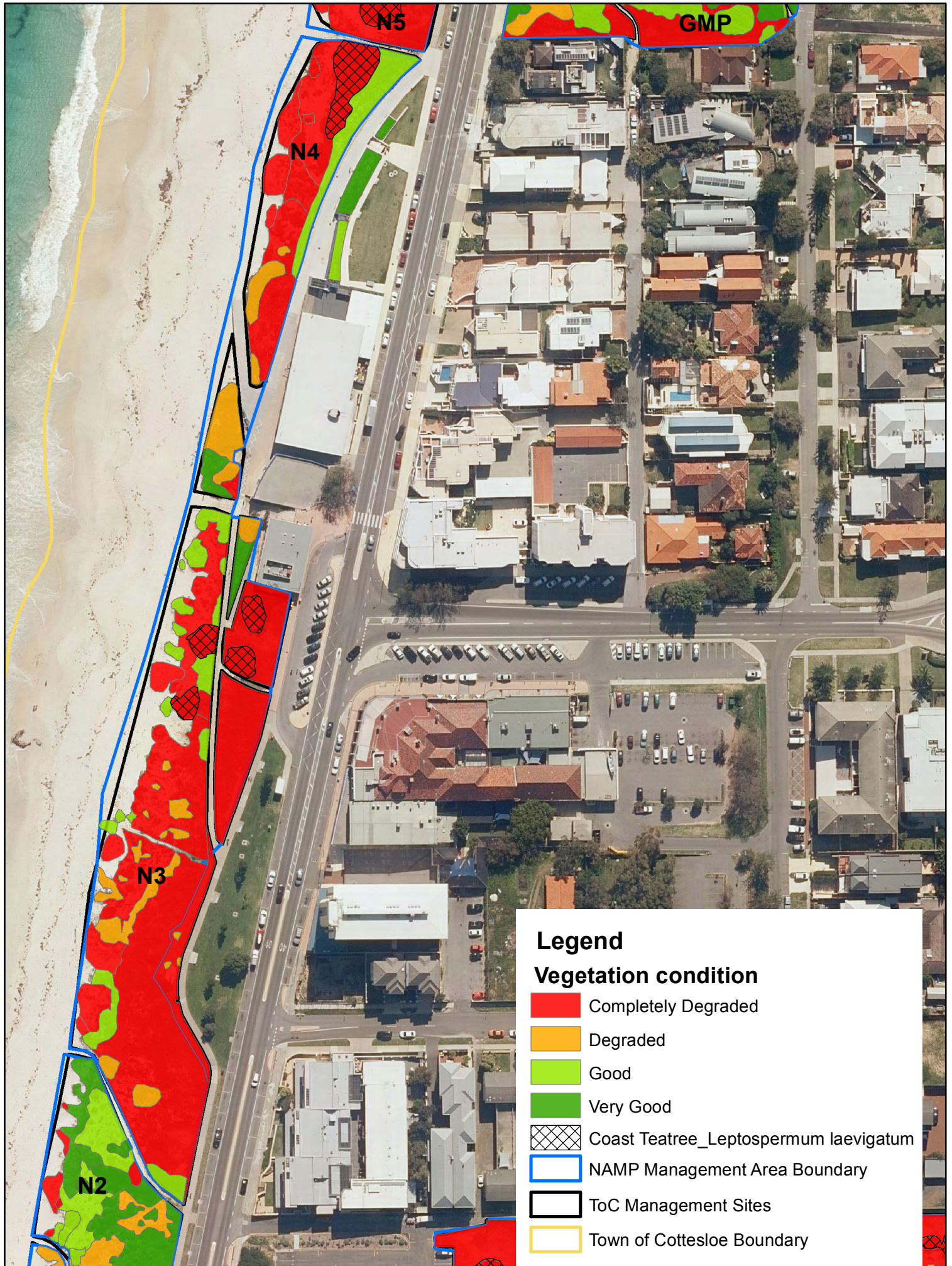
**Legend**

**Vegetation condition**

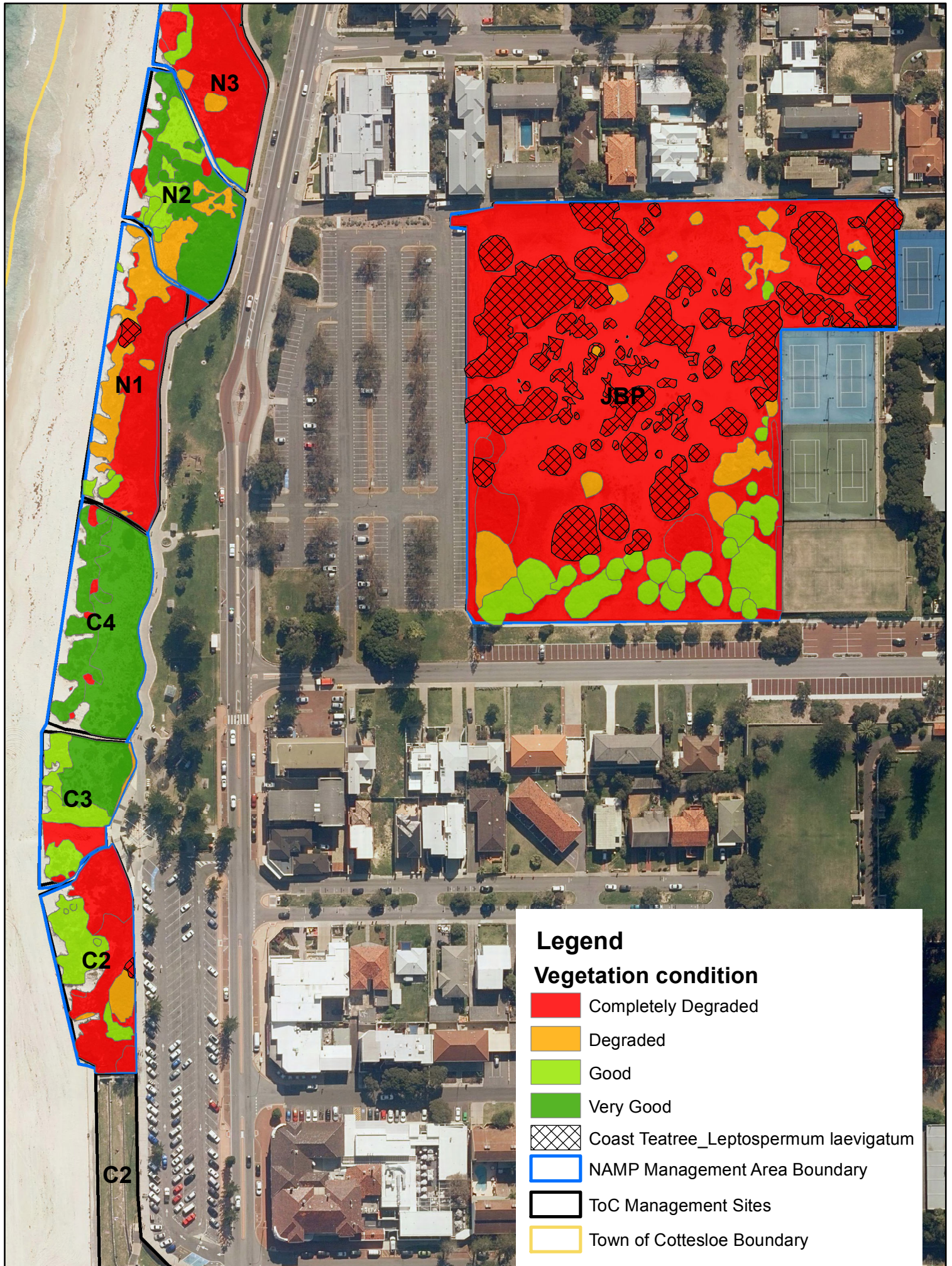
- Completely Degraded
- Degraded
- Good
- Very Good
- Coast Teatree\_Leptospermum laevigatum
- NAMP Management Area Boundary
- ToC Management Sites
- Town of Cottesloe Boundary



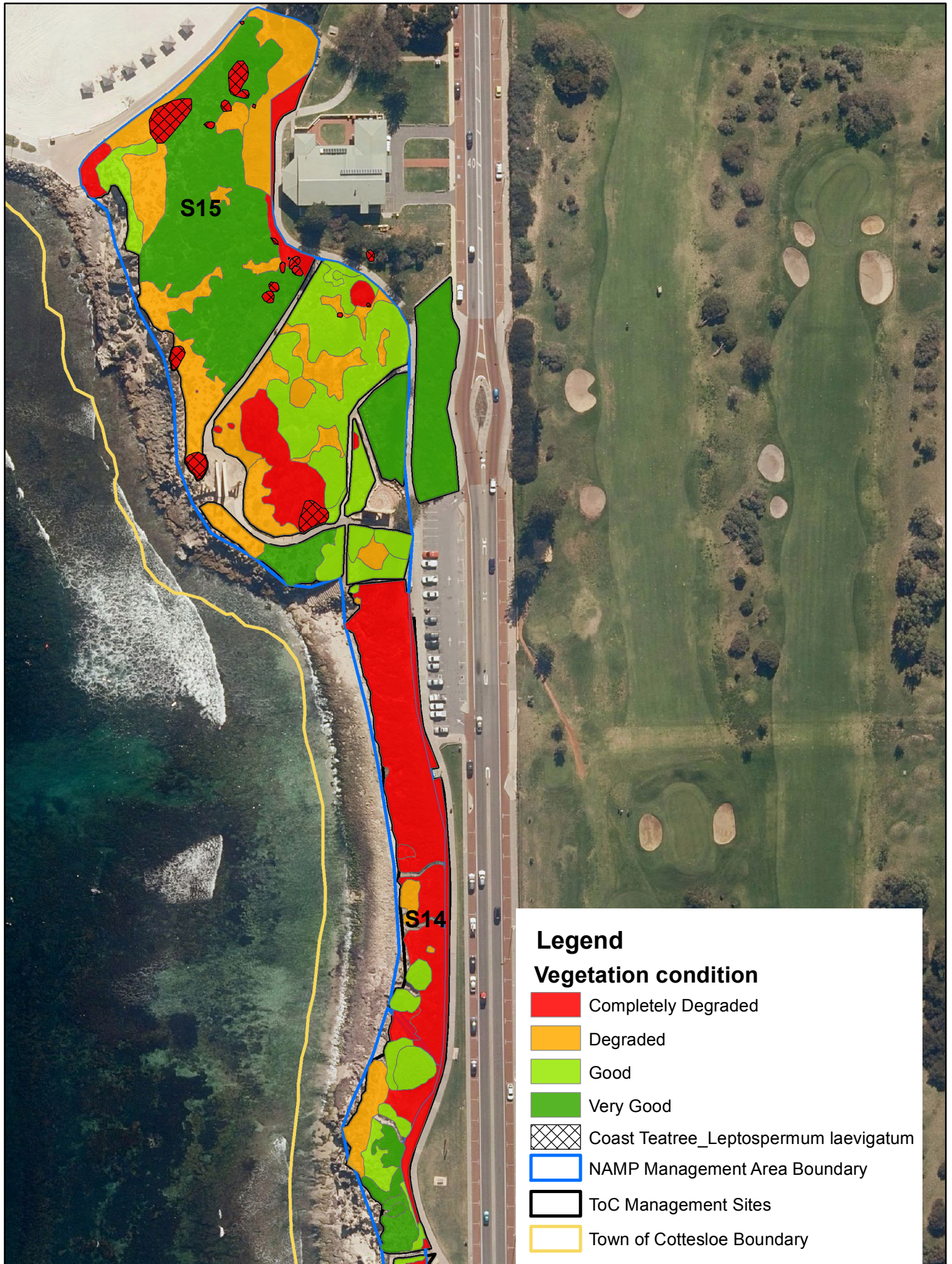












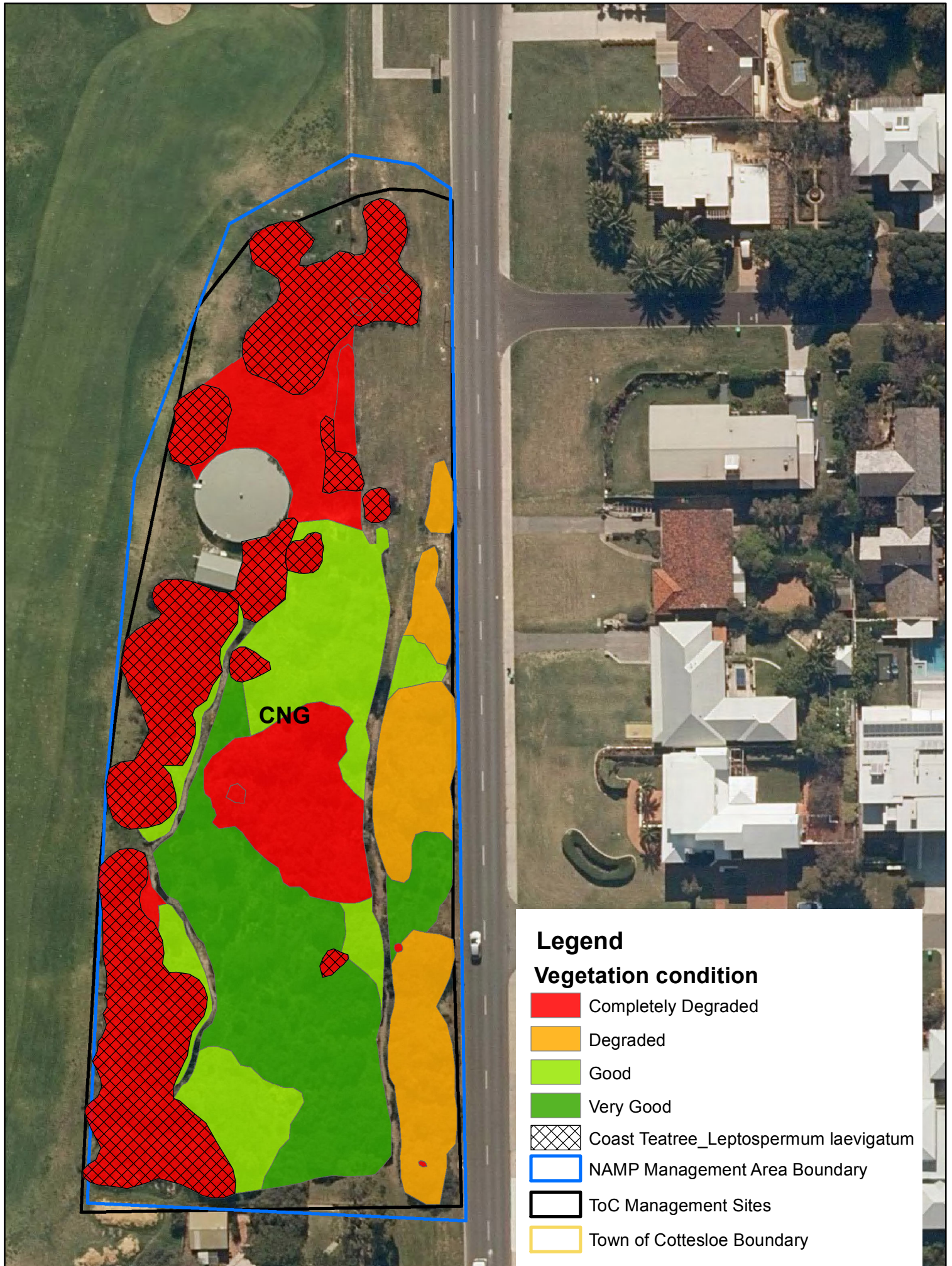
**Legend**

**Vegetation condition**

- Completely Degraded
- Degraded
- Good
- Very Good
- Coast Teatree\_Leptospermum laevigatum
- NAMP Management Area Boundary
- ToC Management Sites
- Town of Cottesloe Boundary







**Legend**

**Vegetation condition**

- Completely Degraded
- Degraded
- Good
- Very Good
- Coast Teatree\_Leptospermum laevigatum
- NAMP Management Area Boundary
- ToC Management Sites
- Town of Cottesloe Boundary











**Legend**

**Vegetation condition**

- Completely Degraded
- Degraded
- Good
- Very Good
- Coast Teatree\_*Leptospermum laevigatum*
- NAMP Management Area Boundary
- ToC Management Sites
- Town of Cottesloe Boundary





**Natural Areas Management Plan Addendum 1**

**VLAMINGH RESERVE (S1 - S2) AND VICTORIA STREET (VS)**

**Vegetation Condition and Coast Teatree Map**

Author: Syrinx Environmental PL  
 Job Number: 1512  
 Projection: GDA94 MGA Zone 50  
 Date: 29 Jun 2015





## Appendix 2 Implementation Plans for Priority Existing Natural Areas

Different coloured tabs indicate the sites that require maintenance and those that are suited for full restoration activities. **Note:** due to the extent of works needed for clearing of Coast Teatree, Cottesloe Native Gardens has been listed as a restoration site. This area will also need to be maintained to keep the current condition of vegetation intact.

### MAINTENANCE SITES

1. Peters Pool – C3
2. Peters Pool – C4
3. Bryan Way – N2
4. Grant Marine Park - GMP
5. Mudurup Rocks – S15
6. Dutch Inn – S5
7. Dutch Inn – S7
8. Vlamingh Reserve – S1

### RESTORATION SITES

1. Cottesloe Native Gardens - CNG
2. Peters Pool – N1
3. North Cottesloe - N3
4. North Cottesloe - N4
5. North Street - N12



# SITE INFORMATION – Peters Pool – C3

## Changes in Vegetation since 2008



May 2008

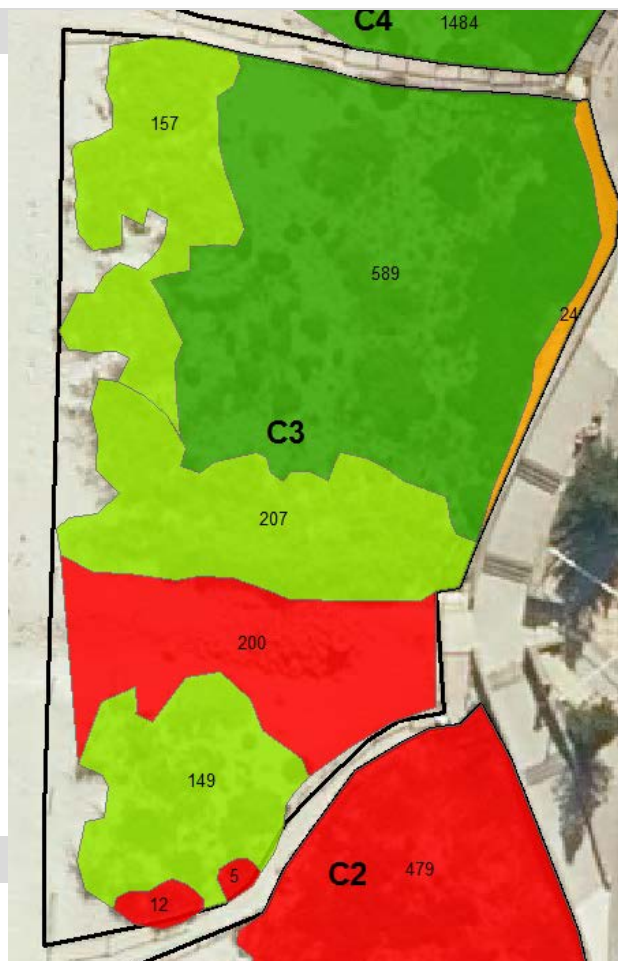
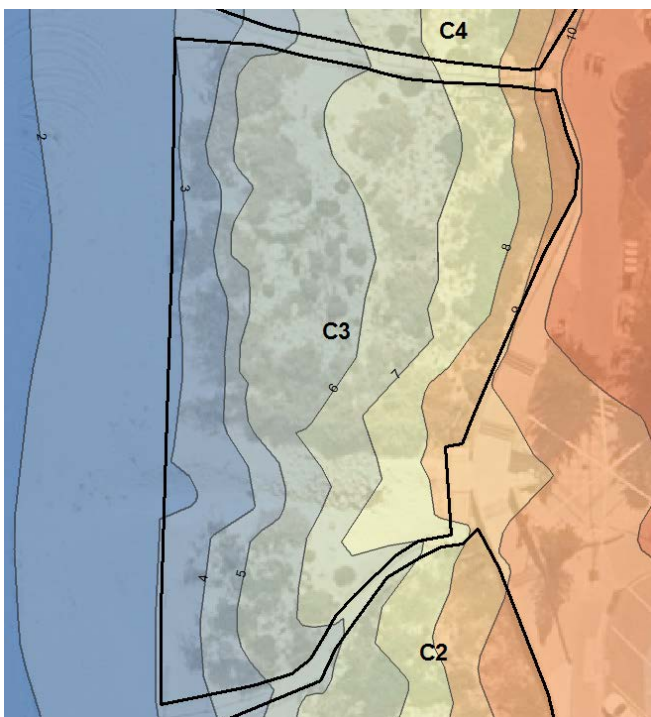


January 2014

- Decrease in weed cover and increase in native plant cover due to restoration works
- No woody weeds
- The increase in erosion due to stormwater outlet works and subsequent water scour.

### BASELINE (2015) VEGETATION CONDITION

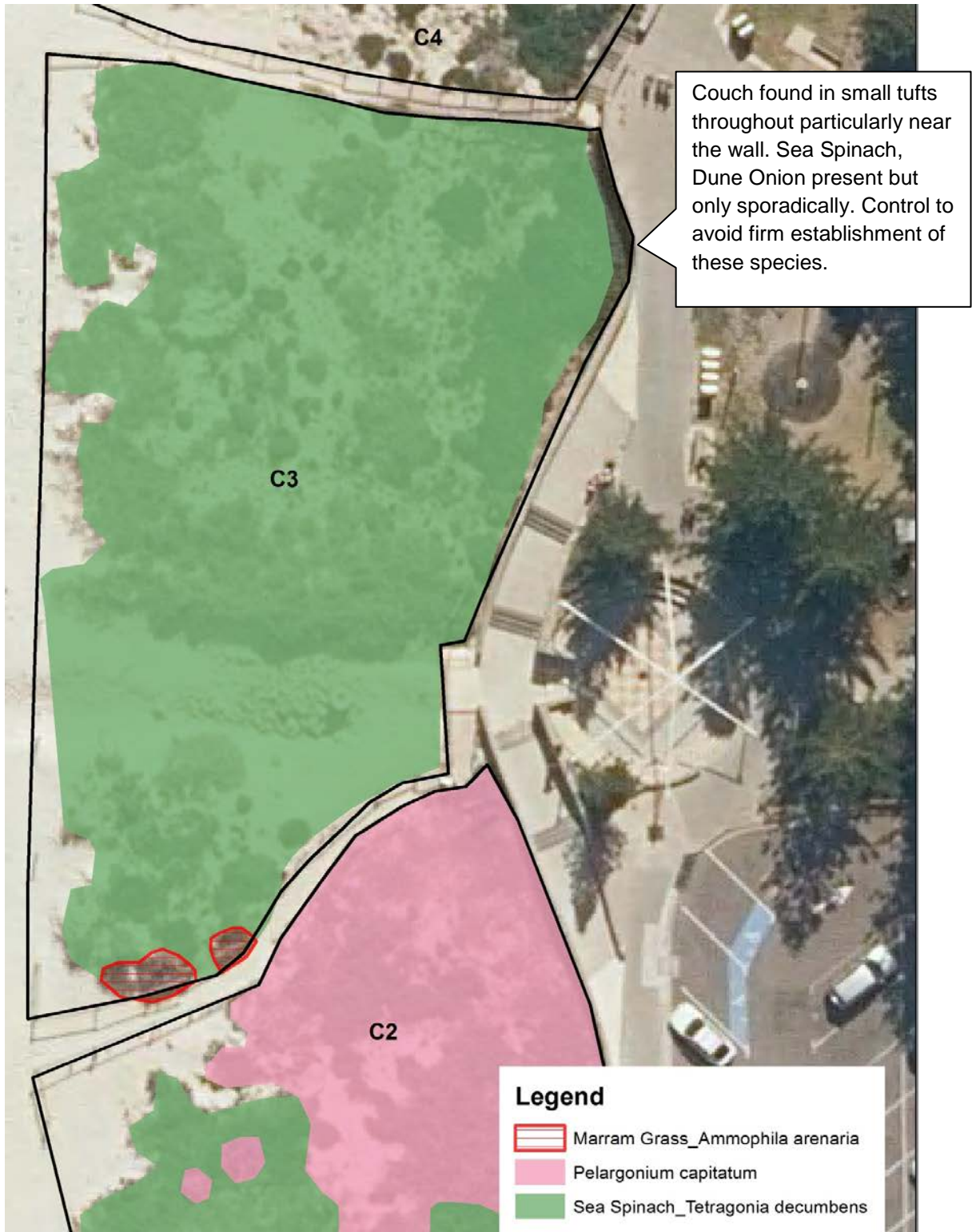
Very Good	44%
Good	38%
Degraded	2%
Completely Degraded	16%



Mixed native planted shrubs of *Scaevola crassifolia*, *Olearia axillaris*, and *Rhagodia baccata* with *Spinifex longifolius* and *Ficinia nodosa*.

**WEEDS**

- Dominant weeds** Couch, especially along the wall, Marram Grass (see polygons 12 and 5), Sea Spinach.
- Other weeds:** Dune Onion Weed, Oxalis sp. Pelargonium (low number of plants at the southern end of C4 path)
- Woody Weeds:** Nil



Distribution of high priority weeds at Peters Pool – C3



**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

Major erosion around the stormwater outlet. The issue lies in the design of the spillway and installation of geofabric. Revegetate only when earthworks are completed. Limestone not considered necessary in the amount present, as most of the water spill occurs directly adjacent to the stormwater outlet and undermines the rocks. Consider diverting stormwater to swales or rain gardens to help reduce erosion. Opportunities exist on Overton Garden Street and John Black Park / Naper street western end. Investigate opportunities to 'hide the pipe under a boardwalk or similar while maintaining service access. If this is done, rock pitching surrounding the pipe can be mortared in.

**Wind erosion** also present but low to the centre of the site. Site is also trampled by public – access from C2.



**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes

**Planting:** Yes

**CONDITION OF INFRASTRUCTURE**

**Pathway:** C3 - Poor – loose bollards.

**Signage:** Good

**Fencing:** Pine bollards along access path in poor to moderate condition – low in amenity and loose in parts.



**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** Low

**Maintenance Priority:** High

BASIC STATISTICS- Peters Pool - C3	
Total AREA (m <sup>2</sup> )	1484
Completely degraded	217
Degraded	24
Good	513
Very Good	589
Total vegetated area (m2)	1343
Bare area without infrastructure (e.g. paths or structures)	141
Woody weeds removal	0
Weed areas including woody weeds	217
Area to stabilise by coir mat or jute matt	200
Area to plant (m <sup>2</sup> )	358
Number of plants required (at 3/m <sup>2</sup> )	1074
Supplementary Plants required (30%)	322

NOTE: Suggested number of plants is considering denser planting of *Spinifex* and not solely shrubs that can be planted at a lower density. Of the total number of plants recommended, 60% is for *Spinifex longifolius*.

#### AIMS OF REVEGETATION FOR 2015 - 2019

- No more than 5% of the area covered by weeds by 2017
- 80% or more of the area is in Very Good condition by 2018
- No Marram Grass present by 2016
- No Couch (*Cynodon dactylon*) present by 2017

#### AIMS FOR CAPITAL WORKS - INFRASTRUCTURE

- Stormwater outlet is repaired to minimise or eliminate dune erosion by 2016
- Access ways are upgraded with new bollards / fencing structures / art by 2018

#### OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT

- Incorporate rain / stormwater swales on Overton Garden Street and western end of John Black Dune Park or new gardens as planned in the Foreshore Redevelopment Plan
- During FRP development and implementation period maintain weed control to ensure the site is well



## IMPLEMENTATION PLAN - Peters Pool – C3

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose. For the majority of site two inspections and litter collections per year can be made if the litter is not visible.
<b>Weed Control</b>	Manually remove Weeds growing over native plants	Every 2 months	ToC, CCA	Inspect. Organise a workbee if manual weeding would take a long time. Work with no more than 10 people and work in a line parallel to shore to examine the entire site.
	Apply Herbicide	<b>3 x per year in 2016 then 2 x per year. end of April beginning of May, July and September</b>	ToC	Refer to maps for details of weed infestation - use electronic version to quickly inspect type of weeds and distribution. Ensure whole site is covered each time whenever possible. Specific attention to be given to Couch along the limestone retaining wall. <b>Refer to Appendix 6 or see NAMP Tables 45 and 46 for details on herbicide information and rates of application.</b>
	Eradicate Marram Grass	2 x per year	ToC / Contractor	Cut and remove Marram Grass or wipe with Glyphosate.
<b>Fence repair</b>	Check and repair any damage to fencing	Weekly / during regular refuse collection	ToC	Drive / walk by. Seek help from CCA volunteers for monitoring.
<b>Erosion control</b>	Jute matt eroded areas near stormwater outlet. Consider wind fence if necessary.	Upon completion of stormwater outlet erosion control	ToC / Contractor	Install jute matt according to manufacturer's specifications. Use starch pins - metal pins rust away to sharp points and are difficult to find and remove.
<b>Planting</b>	Ensure access ways are fenced off to public	1 month prior to planting - April	ToC	Install temporary fence along the pathway to prevent the public access to eroded / newly planted areas. Organise signage to inform public of upcoming works and the fact that the once is temporary. Galvanised star pickets and ring lock wire can be used for this purpose - consider amenity issues.
	Order plants from nursery	August	ToC / CCA	Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity according to the available budget. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species.
	Order plant guards and fertiliser tablets	March	ToC	Check with nursery that the stock will be available and ready for planting. Not all plants will require guards. For <b>C3</b> , 1/4 of plants can have guards. One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organised meeting with schedule of planned works.
	Ensure water is available to water plants upon installation	April	ToC	Water truck availability, water connection to the mains water supply, hoses, etc. Availability of these on weekends.
	Install plants	last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is visible to pedestrians. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Coast is very windy and this the main reason most plants dehydrate. If the forecast is dry ensure sufficient water is available in the first month of planting. Create wells around each plant to facilitate easier watering. If planting in jute matted area ensure jute is cut to make 20cm openings for each plant. Use fertiliser tablet 1 per plant as per manufacturers specifications
	Install plant guards	May - June	CCA / ToC / Contractor	Install plant guards as recommended. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen easier during maintenance and that plant deaths can be monitored (counting collected stakes is much easier than counting plants)
	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal depending on the condition.
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect the site. Collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.

# SITE INFORMATION – Peters Pool – C4

## Changes in Vegetation since 2008



May 2008



January 2014

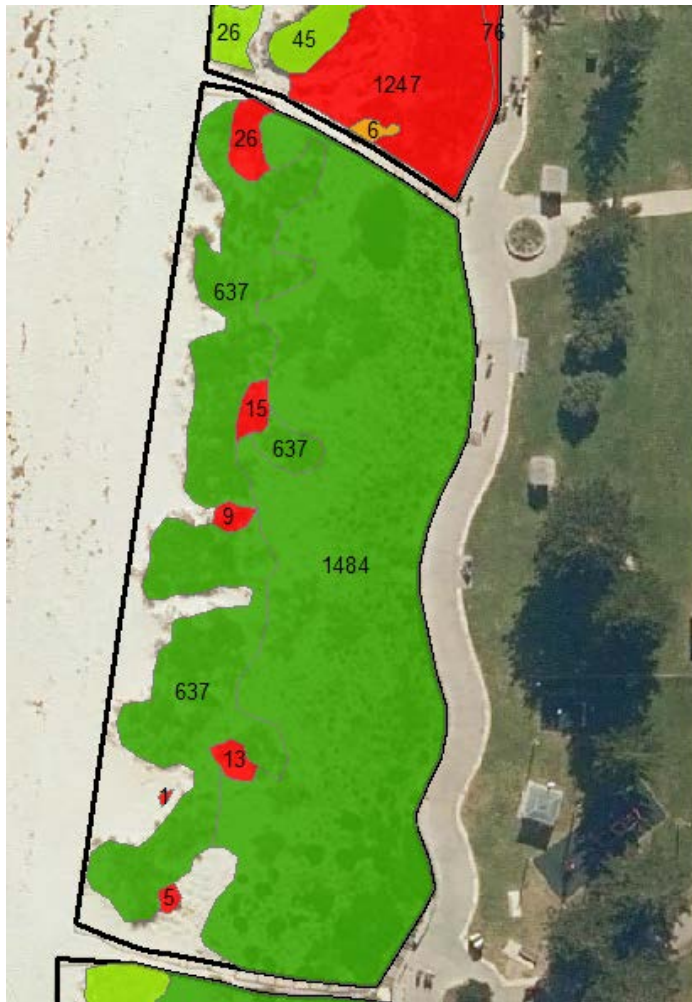
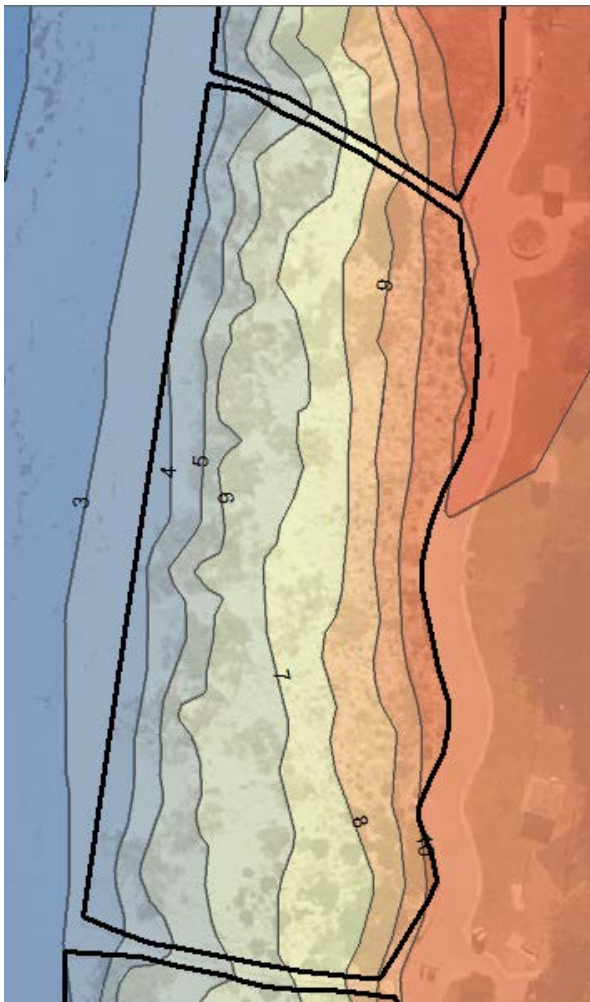
- Substantial decrease in weed cover and increase in native plant cover due to restoration works
- No woody weeds
- Increase in amenity value
- Upgrade to access ramp

### BASELINE (2015) VEGETATION CONDITION

Very Good	97%
Good	0%
Degraded	0%
Completely Degraded	3%

Overall this site shows the best condition of all sites within the Town's natural areas.





**Note:** Numbers inside polygons denote area in m<sup>2</sup>

**NATIVE VEGETATION**

Mixed native planted shrubs of *Scaevola crassifolia*, *Olearia axillaris*, and *Rhagodia baccata* with *Spinifex longifolius* and *Ficinia nodosa*

**WEEDS**

- Dominant weeds** Couch especially along wall, Marram Grass (see red polygons), Sea Spinach, and *Pelargonium*.
- Other weeds:** Dune Onion Weed and Sea Wheat Grass (low number of plants see small polygon 1 and few plants scattered amongst Spinifex).
- Woody Weeds:** Nil







**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

Some **Wind erosion** also present but low to the south west of the site. Low level of trampling observed

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes

**Planting:** Yes

**CONDITION OF INFRASTRUCTURE**

**Pathway:** C4 – Good access

**Signage:** Good

**Fencing:** Pine bollards along access path in poor to moderate condition – low in amenity and loose in parts.



**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** Low

**Maintenance Priority:** High

BASIC STATISTICS – Peters Pool – C4	
Total AREA (m <sup>2</sup> )	2576
Completely degraded	69
Degraded	
Good	
Very Good	2121
Total vegetated area (m <sup>2</sup> )	2190
Bare area without infrastructure (e.g. paths or structures)	386
Woody weeds removal	
Weed areas including woody weeds	69
Area to stabilise by coir mat or jute matt	
Area to plant (m <sup>2</sup> )	455
Number of plants required (at 3/m <sup>2</sup> )	1365
Supplementary Plants required (30%)	410
Fencing (linear metres)	
Sand trap fencing (linear metres)	

**NOTE:** Suggested number of plants is considering denser planting of *Spinifex* and not solely shrubs that can be planted at a lower density. Of the total number of plants recommended 70% is for *Spinifex longifolius*. The thick band should be maintained to approximately 7m AHD (see topography map for indicative levels).

**AIMS OF REVEGETATION FOR 2015 - 2019**

- No more than 5% of the area covered by weeds by 2017
- 100% of the area is in Very Good condition by 2018
- No Marram Grass present by 2016
- No Couch (*Cynodon dactylon*) present by 2017
- No or less than 20 Sea Wheat Grass plants present by 2017

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- Access way bollards / fencing are upgraded by 2018

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Implement restoration works in section N1 to improve ecological links to the coastal bushland to the north of Cottesloe and strengthen the resilience of this site and Site N2 (Bryan Way Foredune) (lower weed invasion, etc.).
- Link with John Black Dune Park through the use of plant species indigenous to the site.



Links between the site and good condition natural areas (annotated green) Restoration of Site N1 and N3 – N4 is particularly important not only in creating a green link but also increasing amenity value.





Good vegetation cover on the C4 dunes



Clump of Marram Grass with treated *Pelargonium* in foreground



## IMPLEMENTATION PLAN - Peters Pool – C4

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose. For the majority of site two inspections and litter collections can be made if the litter is not visible.
<b>Weed Control</b>	Manually remove Weeds growing over native plants	Every 2 months	ToC, CCA	Inspect. Organise a workbee if manual weeding would take a long time. Work with no more than 10 people and work in a line parallel to shore to examine the entire site.
	Apply Herbicide	3 x per year in 2016 then 2 x per year. End of April beginning of May, July and September	ToC	Refer to maps for details of weed infestation - use digital weed layer maps to quickly inspect type of weeds and distribution. Ensure whole site is covered each time whenever possible. Specific attention to be given to Couch along the limestone retaining wall. <b>Refer to NAMP Tables 45 and 46 for details on herbicide information and rates of application.</b>
	Eradicate Marram Grass	2 x per year	ToC / Contractor	Cut and remove Marram Grass and wipe / spray with Glyphosate.
	Eradicate Sea Wheat Grass	2 x per year	ToC / CCA/ Contractor	Cut and remove large plants and wipe with Glyphosate. Manually dig out any small plants.
<b>Fence repair</b>	Check and repair any damage to fencing	Weekly / during regular refuse collection	ToC	Drive / walk by. Seek help from CCA volunteers for monitoring
<b>Erosion control</b>	Monitor wind erosion and human induced erosion / trampling and implement preventative measures	During regular inspections	ToC	Install fencing or signage to deter public from entering the site. Install wind fencing if the wind erosion becomes a problem. Plant densely along access pathway and along foreshore
<b>Planting</b>	Order plants from nursery	August	ToC / CCA	Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity according to available the budget. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species.
	Order plant guards and fertiliser tablets	March	ToC	Check with the nursery that the stock will be available and ready for planting. Not all plants will require guards. For <b>C4</b> , 1/5 of plants can have guards. One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organised meeting with schedule of planned works
	Ensure water is available to water plants upon planting	April	ToC	Water truck availability, water connection to the mains water supply, hoses, etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is visible. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Coast is very windy and this the main reason most plants dehydrate. Thus, if the forecast indicates no rain ensure sufficient water is available in the first month of planting. Create wells around each plant to facilitate easier watering. If planting in jute matted area, ensure jute is cut to make 20cm openings for each plant. Use fertiliser tablet (1 per plant) as per manufacturers specifications
	Install plant guards	May - June	CCA / ToC / Contractor	Install plant guards as recommended. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen easier during maintenance and that plant deaths can be monitored (counting collected stakes is much easier than counting plants)
	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal (depending on condition).
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect the site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.



# SITE INFORMATION – Bryan Way - N2

## Changes in Vegetation since 2008



May 2008



January 2014

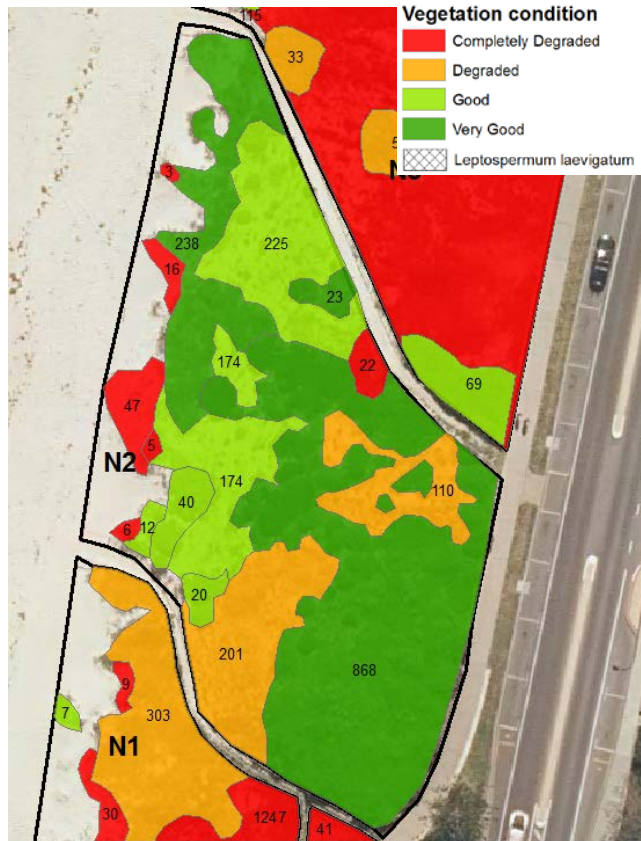
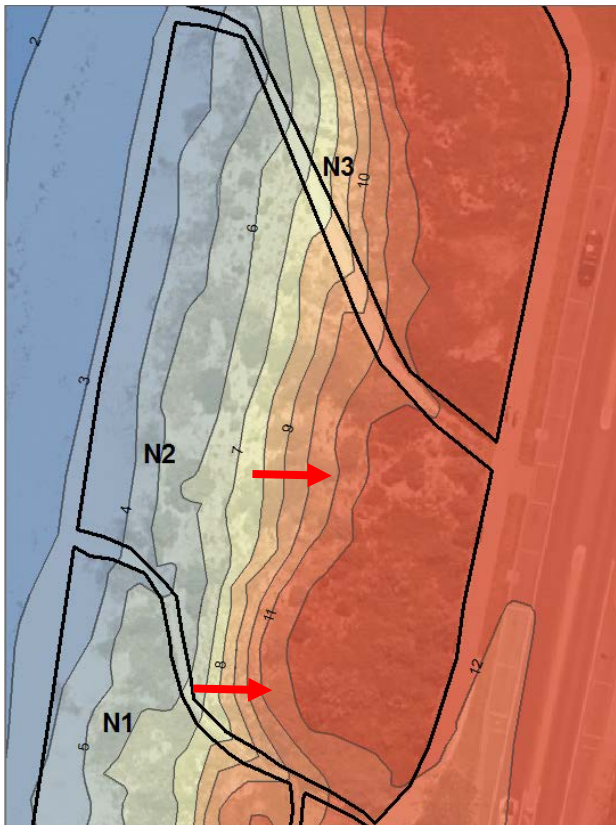
Red arrows indicate water erosion points. Yellow Arrows indicate changes in vegetation.

- Substantial increase in native vegetation cover
- No woody weeds
- Increase in amenity value
- Increase in couch cover

### BASELINE (2015) VEGETATION CONDITION

Very Good	56%
Good	23%
Degraded	15%
Completely Degraded	5%

Overall this site shows good condition for a mature rehabilitated site. However, Couch invasion is prevalent on top of the dune and erosion features are present also (indicated) in red arrows hampering vegetation establishment. The site is listed to be of Medium Restoration and High maintenance priority due to the site being steep and requiring some erosion control works.



**Note:** Numbers inside polygons denote area in m<sup>2</sup>

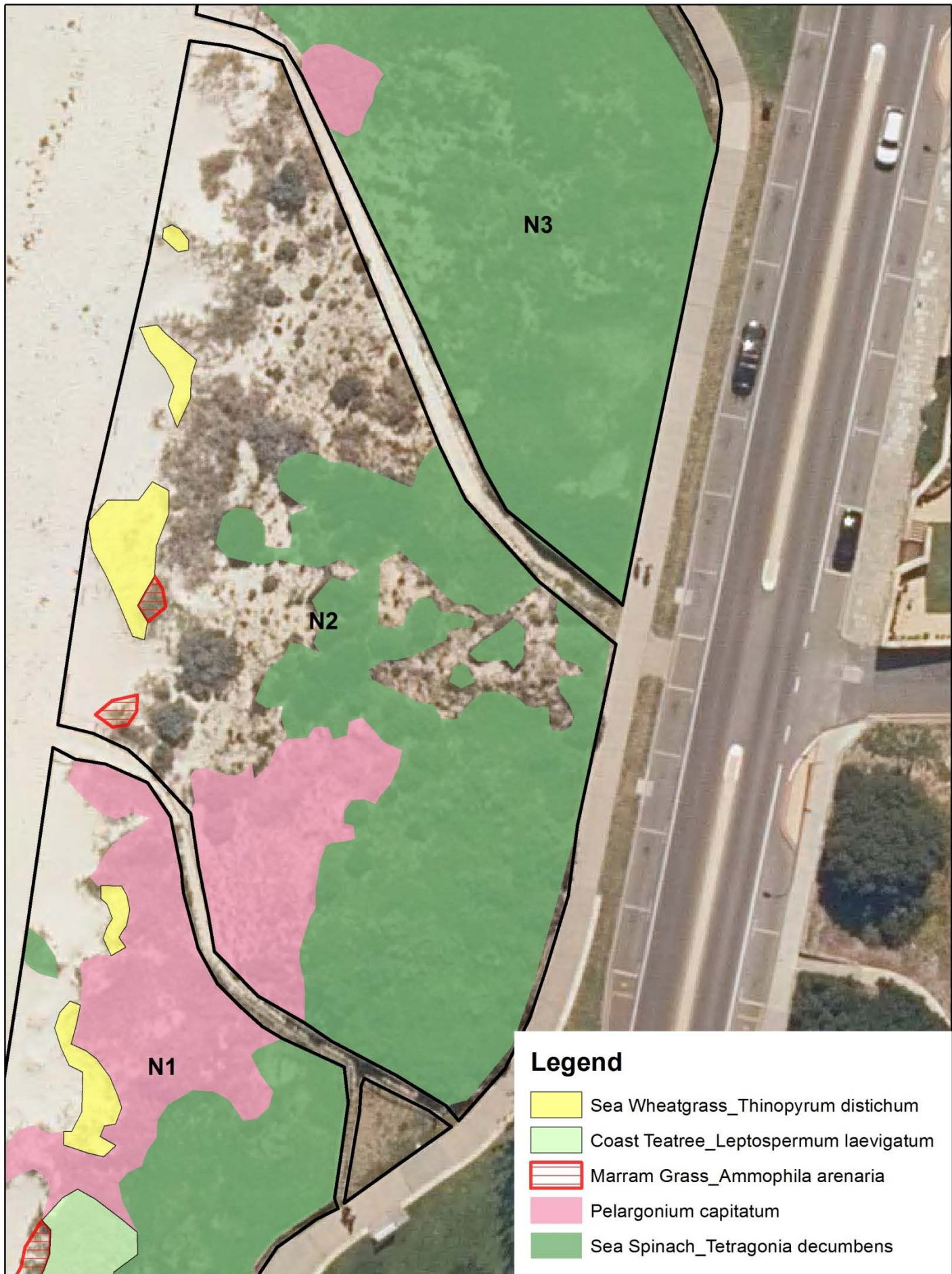
**NATIVE VEGETATION**

Mixed native planted shrubs of *Scaevola crassifolia*, *Olearia axillaris*, and *Rhagodia baccata* with *Spinifex longifolius* and *Ficinia nodosa*

**WEEDS**

- Dominant weeds** Couch especially at the top of the slope near pathway. *Pelargonium*. (5-10%) Dune Onion Weed, (20%) Beach Evening Primrose (15%) and Sea Spinach are also common
- Other weeds:** Sea Wheat Grass and Marram Grass present along foreshore (red polygons)
- Woody Weeds:** Nil





Distribution of High Priority Weeds for Bryan Way – N2

**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

Some surface water erosion present in areas indicated by red arrows. This corresponds to steepest parts of the site. Some jute matting and dense planting will be required in these areas.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes - irregular

**Planting:** Yes – supplementary

**CONDITION OF INFRASTRUCTURE**

**Pathway:** N2 – Good access

**Signage:** Good

**Fencing:** Pine bollards along access path in poor to moderate condition – low in amenity and loose in parts.

**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** Medium

**Maintenance Priority:** High

<b>BASIC STATISTICS – Bryan Way - N2</b>	
<b>Total AREA (m<sup>2</sup>)</b>	<b>2279</b>
<b>Completely degraded</b>	<b>99</b>
<b>Degraded</b>	<b>311</b>
<b>Good</b>	<b>471</b>
<b>Very Good</b>	<b>1129</b>
<b>Total vegetated area (m2)</b>	<b>2010</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>269</b>
<b>Woody weeds removal</b>	
<b>Weed areas including woody weeds</b>	<b>99</b>
<b>Area to stabilise by coir mat or jute matt</b>	<b>200</b>
<b>Area to plant (m<sup>2</sup>)</b>	<b>368</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>1104</b>
<b>Supplementary Plants required (30%)</b>	<b>331</b>
<b>Fencing (linear metres)</b>	
<b>Sand trap fencing (linear metres)</b>	



**NOTE: Suggested number of plants is considering denser planting of *Lepidosperma gladiatum* and *Ficinia nodosa* in higher areas of the slope and *Spinifex* near the shore to replace weed species. Shrubs should be no more than 20- 25% of the total plant numbers.**

**AIMS OF REVEGETATION FOR 2015 - 2019**

- <5% of the area covered by weeds by 2017
- 80% or more of the area is in Very Good condition by 2018
- No Marram Grass or Sea Wheat present by 2017
- <2% or no Couch (*Cynodon dactylon*) present by 2017

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- Access way bollards / fencing are upgraded by 2018

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Link with John Black Dune Park using plant species indigenous to site.



Links between site N2 and other good condition natural areas (annotated green). Link with John Black Dune Park can increase amenity and habitat value locally.



Bare steep slope with potential to erode



Sea Wheat Grass

## IMPLEMENTATION PLAN - Bryan Way - N2

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose. For the majority of site two inspections and litter collections per year can be made if the litter is not visible.
<b>Dead Vegetation Removal</b>	Remove dead shrubs on top of the slope and replant the area	Winter 2015/2016	ToC	Remove dead shrubs to increase the amenity of the area and allow for effective weed control and planting. If cut small some of the material can be left on site.
<b>Weed Control</b>	Manually remove Weeds growing over native plants	Every 2 months	ToC, CCA	Inspect. Organise a workbee if manual weeding would take a long time. Work with no more than 10 people and work in a line parallel to shore to examine the entire site.
	Apply Herbicide	3 x per year in 2016 then <b>2 x per year</b> . end of <b>April</b> beginning of <b>May</b> , <b>July</b> and <b>September</b>	ToC	Refer to maps for details of weed infestation - use digital version maps to quickly inspect type of weeds and distribution. Ensure whole site is covered each time whenever possible. Specific attention to be given to Couch along the top of the dune. <b>Refer to NAMP Tables 45 and 46 for details on herbicide information and rates of application.</b>
	Eradicate Marram Grass	2 x per year	ToC / Contractor	Cut and remove Marram Grass and wipe / spray with Glyphosate.
	Eradicate Sea Wheat Grass	2 x per year	ToC / CCA/ Contractor	Cut and remove large plants and wipe with Glyphosate. Manually dig out any small plants.
<b>Fence repair</b>	Check and repair any damage to fencing	Weekly / during regular refuse collection	ToC	Drive / walk by. Seek help from CCA volunteers for monitoring
<b>Erosion control</b>	Install erosion control matting and or brush	April - May	ToC	Install jute matting on the steep slope and plant densely with species such as <i>Lepidosperma gladiatum</i> and <i>Scaevola crassifolia</i> . <i>Acacia rostellifera</i> can also be used.
<b>Planting</b>	Order plants from nursery	August	ToC / CCA	Use NAMP plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity according to available budget. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species.
	Order plant guards and fertiliser tablets	March	ToC	Check with nursery that the stock will be available and ready for planting. Not all plants will require guards – use guards along pathways where plants can get trampled or One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organised meeting with schedule of planned works
	Ensure water is available to water plants upon planting	April	ToC	Water truck availability, water connection to the mains water supply, hoses etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for their growth requirements and amenity. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Create wells around each plant to facilitate easier watering. If planting in jute matted area, ensure jute is cut to make 20cm openings for each plant. Use fertiliser tablet (1 per plant) as per manufacturer's specifications.
	Install plant guards	May - June		Install plant guards as recommended along pathways and in highly exposed areas. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen during maintenance activities. Plant deaths can also be monitored by removing and counting collected stakes.
	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal (depending on condition).
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map / note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect the site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.



# SITE INFORMATION – Grant Marine Park - GMP

## Changes in Vegetation since 2008



May 2008



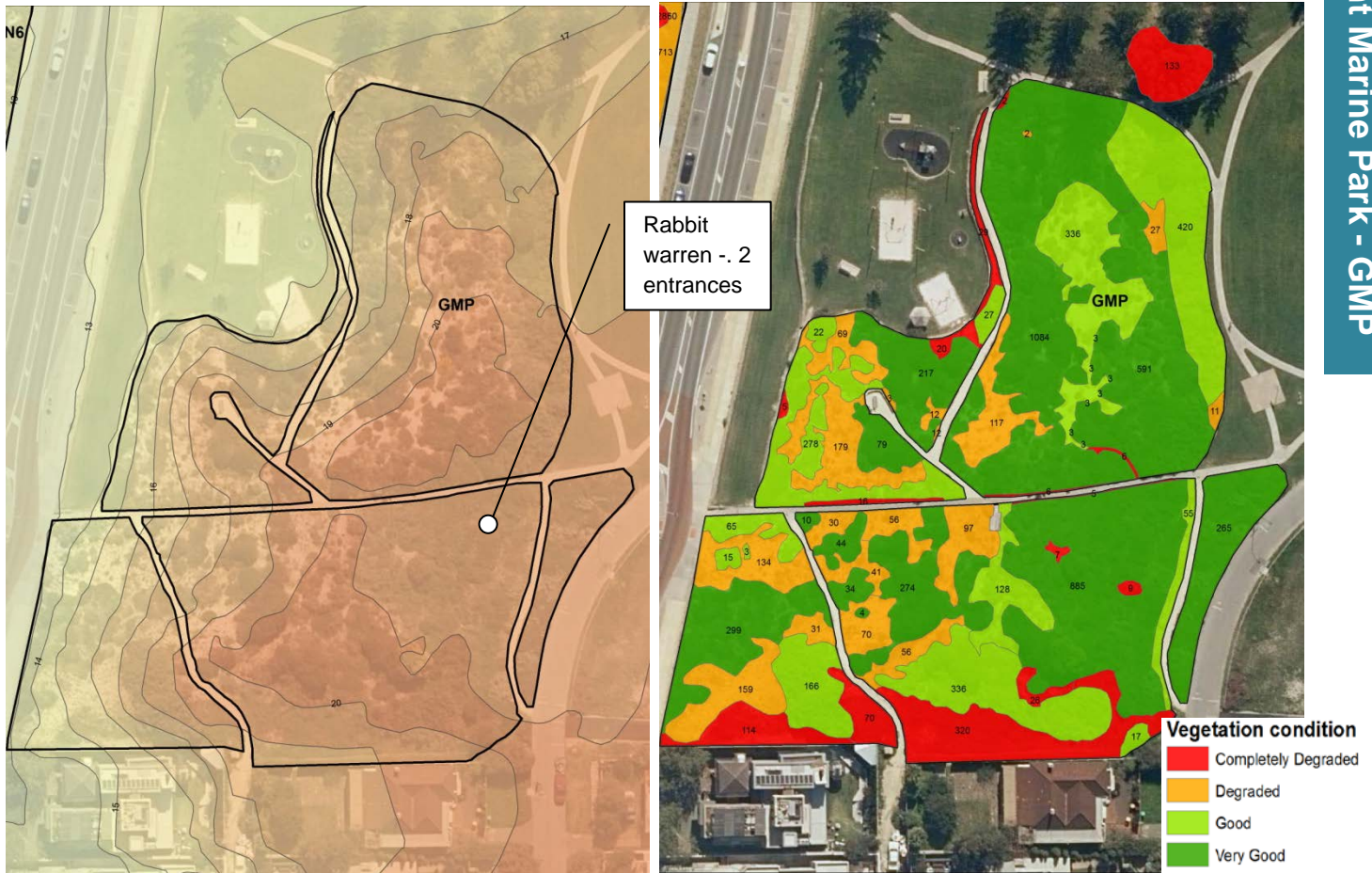
January 2014

- Substantial increase in native vegetation cover and extent via establishment of additional garden beds
- No woody weeds
- Increase in amenity value

### BASELINE (2015) VEGETATION CONDITION

Very Good	51%
Good	25%
Degraded	15%
Completely Degraded	9%

Large proportion of areas mapped as Degraded have been revegetated in 2013- 2014 and are establishing with potential to further increase habitat value and overall condition of the area.



**Note:** Numbers inside polygons denote area in m<sup>2</sup>

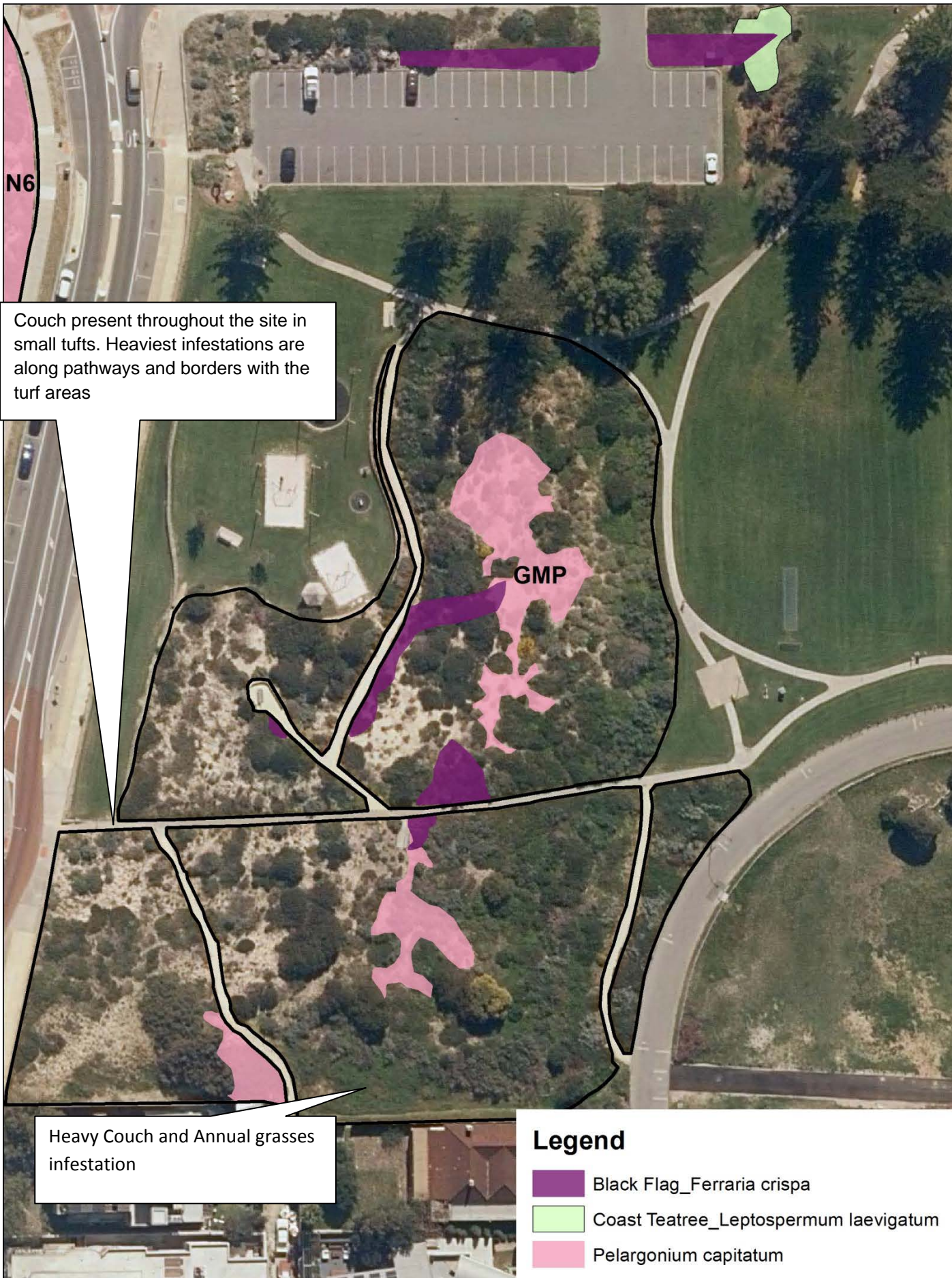
### NATIVE VEGETATION

Mixed native remnant and planted shrubs dominated by *Scaevola crassifolia*, *Olearia axillaris*, *Rhagodia baccata*, *Acacia cyclops*, *Acacia lasiocarpa* with *Spinifex longifolius* and *Ficinia nodosa*.

### WEEDS

- Dominant weeds** Couch, Kikuyu and *Oxalis* sp. at the eastern end of the site in particular. Central pathway has a border of Couch.
- Other weeds:** Dune Onion Grass, Annual grasses (dominant is *Lagurus ovatus*), Black Flag and small patches of *Pelargonium*. Other weeds found on this site are listed in Appendix 6.
- Woody Weeds:** Nil.





Distribution of high priority weeds in Grant Marine Park



**PEST FAUNA**

Rabbit - warren and diggings found on site, localised to 30m radius from the warren.

**EROSION AND SLOPE STABILITY ISSUES**

Trampling on the western facing slope and southern areas of site.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes – ongoing by CCA

**Planting:** Yes - ongoing

**CONDITION OF INFRASTRUCTURE**

**Pathways:** Pathways are adequate for the site should have a more natural appearance

**Signage:** Flora ID stands have faded and most are not readable. Upgrade as it is an important educational tool.

**Fencing:** Nil .



Cut turf in native garden areas after mowing activities; Degraded area to the south of the site and a rabbit warren seen on site in April 2015.



**MAINTENANCE AND RESTORATION PRIORITIES**

Restoration Priority: Medium

Maintenance Priority: High

<b>BASIC STATISTICS – Grant Marine Park - GMP</b>	
<b>Total AREA (m<sup>2</sup>)</b>	<b>7390</b>
<b>Completely degraded</b>	<b>635</b>
<b>Degraded</b>	<b>1097</b>
<b>Good</b>	<b>1868</b>
<b>Very Good</b>	<b>3786</b>
<b>Total vegetated area (m2)</b>	<b>7386</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	
<b>Woody weeds removal</b>	
<b>Weed areas including woody weeds</b>	<b>1604</b>
<b>Area to stabilise by coir mat or jute matt</b>	
<b>Area to plant (m<sup>2</sup>)</b>	<b>1604</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>4812</b>
<b>Supplementary Plants required (30%)</b>	<b>1444</b>
<b>Fencing (linear metres)</b>	
<b>Sand trap fencing (linear metres)</b>	

**AIMS OF REVEGETATION FOR 2015 - 2019**

- <5% of the area covered by weeds by 2018
- 80% of the area is in Very Good condition by 2019
- <2% Couch is present at the throughout the site by 2017
- No evidence of rabbits in the area by 2017
- Areas at the southern end of site to be planted by 2017

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

Access way bollards / fencing are upgraded (near playground) by 2019 or plan long term

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Link site to south natural areas via restoration of dunes in section N1, N3 and N4 short term (next 2 - 5 years) and N4 – N6 midterm (5 – 7 yeas) and N7 – N10 long term.
- Strengthen biodiversity linkages with the east by continuing native verge planting along Grant Street.

## IMPLEMENTATION PLAN – Grant Marine Park - GMP

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC, CCA	Inspect daily along pathways and collect / dispose of any litter found. For the majority of site two inspections and litter collections can be made annually if the litter is not visible. CCA can assist with litter collection during regular workbees.
<b>Weed Control</b>	Manually remove Weeds growing over native plants as an aid to chemical control	Every 2 months	ToC, CCA	Inspect. Organise a workbee for manual weeding of select weeds including Pelargonium for example or Kikuyu grass where large stolons are climbing over vegetation.
	Apply Herbicide (grass selective 1 x and non selective 2 x per year)	3 x per year in 2016 then 2 x per year. end of April beginning of May, July and September	ToC	Refer to maps for details of weed infestation - use digital version of weed maps to quickly inspect type of weeds and their distribution. Ensure whole site is covered each time weed control takes place whenever possible. Specific attention is to be given to Couch at the eastern side of site, top of the dune for <i>Pelargonium</i> and Annual grasses and other weeds at the southern end of site.  Use <b>grass selective herbicide prior to using glyphosate</b> so that Couch is controlled without affecting native vegetation. Ensure pathways are treated for Couch also.
	Eradicate / Control Black Flag	1 x per year in June	ToC / Contractor	Wipe with Glyphosate as outlined in NAMP Table 45. And electronic weed maps
<b>Pest (Rabbit) Control</b>	Eradicate Rabbits from site	End of summer or early autumn when food is scarce	ToC / Contractor	Use Pindone baits in accordance to legislation and manufacturer's specifications
<b>Erosion control</b>	Monitor human induced erosion / trampling and implement preventative measures	During regular inspections	ToC	Plant densely along access pathway and use plant guards, install signs on why trampling damages plants (western facing slope near playground).
<b>Planting</b>	Order plants from nursery	August	ToC / CCA	Use a more diverse plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity according to the available budget. It is always preferable to use local provenance stock, but other provenance can be used. Consult with CCA with regards to seed availability and sourcing correct species.
	Order plant guards and fertiliser tablets	March	ToC	Check with nursery that the stock will be available and ready for planting. Not all plants will require guards. ~ 10% of plants can have guards. One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organised meeting with schedule of planned works
	Ensure water is available to water plants upon planting	April	ToC	Water truck availability, water connection to the mains water supply, hoses etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is 'visible' and complementary. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Create wells around each plant to facilitate easier watering. Use fertiliser tablet (1 per plant) as per manufacturers specifications when planting
	Install plant guards	May - June	CCA / ToC / Contractor	Install plant guards as recommended. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen easier during maintenance and that plant establishment success can be monitored.
	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal (depending on condition).
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect the site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.



# SITE INFORMATION – Mudurup Rocks - S15

## Changes in Vegetation since 2008



May 2008

January 2014

→ Indicates changes in vegetation

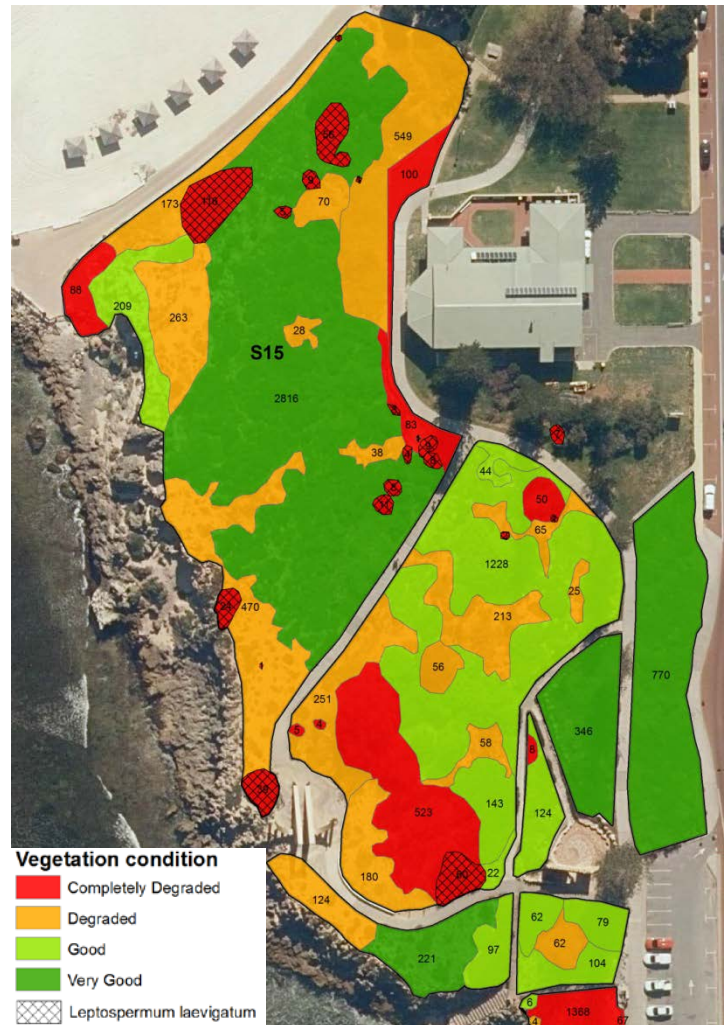
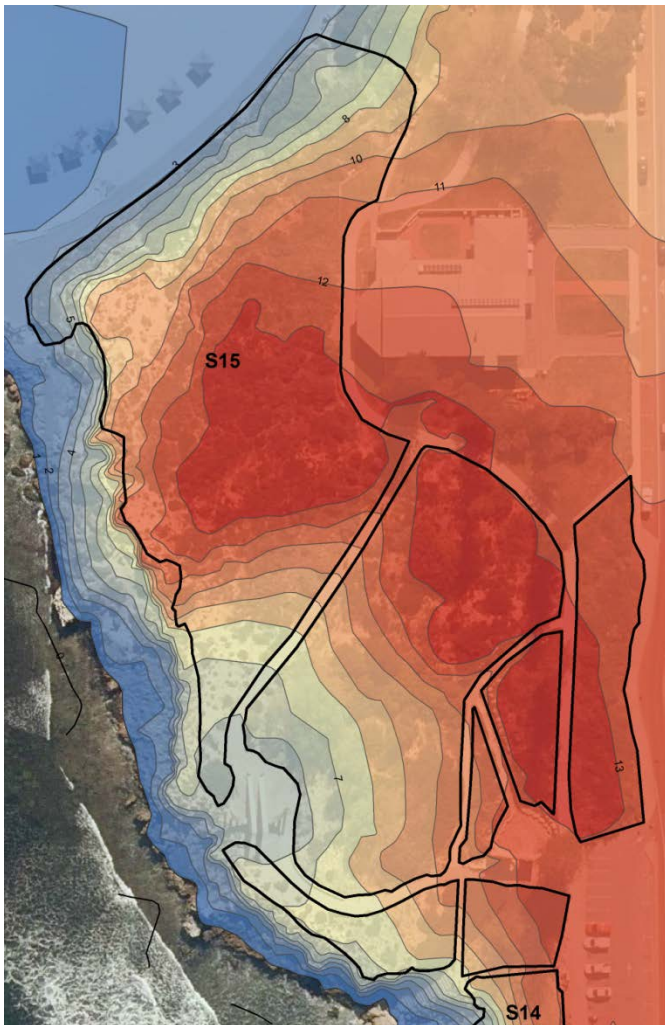
- Substantial increase in native vegetation cover and increase in natural areas via establishment of additional garden beds
- Lower amount of woody weeds
- Increase in amenity value
- Increase in Coast Teatree Cover

### BASELINE (2015) VEGETATION CONDITION

Very Good	41%
Good	21%
Degraded	26%
Completely Degraded	12%

Large proportion of areas mapped as degraded have been revegetated in 2013- 2014 and are establishing with potential to further increase habitat value and overall condition of the area.





**Note:** Numbers inside polygons denote area in m<sup>2</sup>

**Hatched areas:** Coast Teatree

### NATIVE VEGETATION

Mixed native remnant and planted shrubs of *Scaevola crassifolia*, *Olearia axillaris*, *Rhagodia baccata*, *Acacia rostellifera* and *Acacia cyclops* with *Spinifex longifolius* and *Ficinia nodosa*.

### WEEDS

**Dominant weeds** Couch at the northern end of the site, Sea Spinach, along the north west boundary and Dune Onion Weed throughout. Several non native shrubs and trees also present in the southern section of the site

**Other weeds:** Large infestation of Black Flag adjacent to Surf Club (east end of site)

**Woody Weeds:** Coast Teatree.





**Distribution of High Priority Weeds at Mudurup Rocks – S15**

**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

**Wind erosion** along western cliff face and trampling along the northern end of the site

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes

**Planting:** Yes



**CONDITION OF INFRASTRUCTURE**

- Pathway:** S15 – Needs upgrade – upper part of access is steep and slippery to walk on. Good access throughout the site
- Signage:** Good
- Fencing:** Ringlock fencing near dial rusted and in poor condition.  
Pine bollards along access path in moderate condition.

**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** High

**Maintenance Priority:** High

**BASIC STATISTICS – Mudurup Rocks -S15**

<b>BASIC STATISTICS – Mudurup Rocks -S15</b>	
<b>Total AREA (m<sup>2</sup>)</b>	<b>10107</b>
<b>Completely degraded</b>	<b>1227</b>
<b>Degraded</b>	<b>2625</b>
<b>Good</b>	<b>2112</b>
<b>Very Good</b>	<b>4153</b>
<b>Total vegetated area (m<sup>2</sup>)</b>	<b>10117</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>0</b>
<b>Woody weeds removal</b>	<b>898</b>
<b>Weed areas including woody weeds</b>	<b>2103</b>
<b>Area to stabilise by coir mat or jute matt</b>	
<b>Area to plant (m<sup>2</sup>)</b>	<b>2103</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>6309</b>
<b>Supplementary Plants required (30%)</b>	<b>1893</b>
<b>Fencing (linear metres)</b>	<b>To be determined</b>
<b>Sand trap fencing (linear metres)</b>	

**AIMS OF REVEGETATION FOR 2015 - 2019**

- <5% of the area covered by weeds by 2018
- 80% of the area is in Very Good condition by 2019
- <2% Couch is present at the northern end of the site by 2017
- No Coast Tea Trees present by 2019

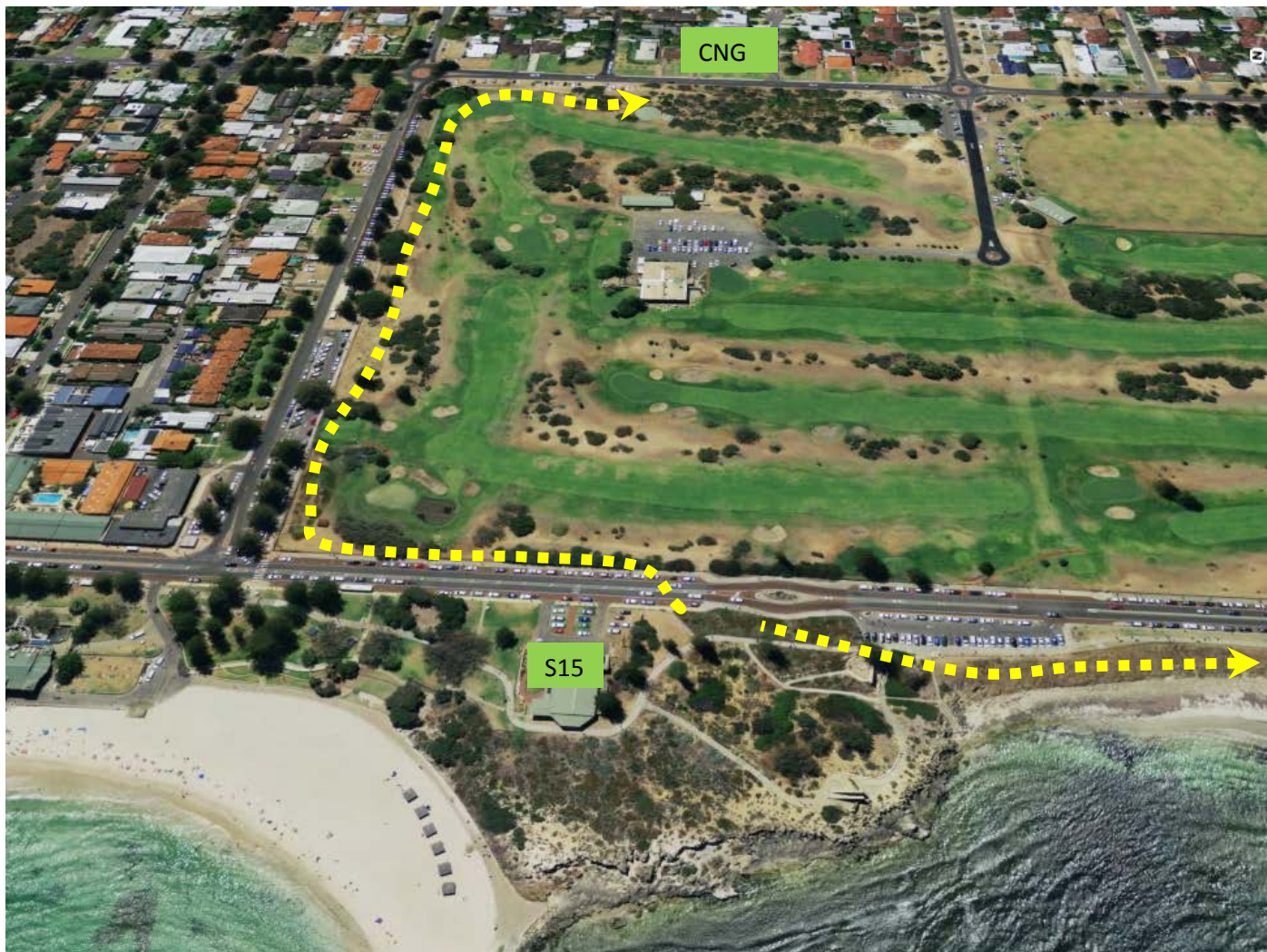
**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- Access way bollards / fencing are upgraded by 2018



**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Investigate linkages with Cottesloe Native Gardens via Golf Course.
- Investigate opportunities for restoring S14 area in the long term to link with Dutch Inn and Vlamingh Reserve.



Links between the site Cottesloe Native Gardens.



Sea Spinach along Cliff face (left) and Couch infested area at the northern end of site with regrow of *Acacia rostellifera*.



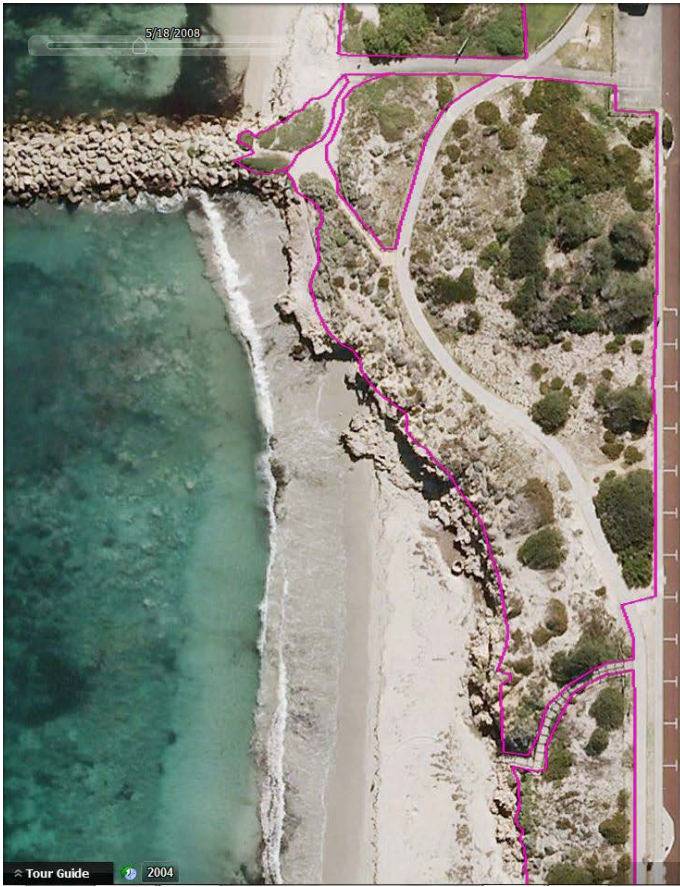
## IMPLEMENTATION PLAN - Mudurup Rocks - S15

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of any litter found. For the majority of site two inspections and litter collections can be made annually if the litter is not visible.
<b>Weed Control</b>	Manually remove weeds growing over native plants and fencing	Every 2 months	ToC, CCA	Inspect. Organise a workbee for manual weeding of Sea Spinach or similar. For Woody weeds removal organise contractor to remove Coast Teatree. In the long term Norfolk Island Hibiscus and other non native trees such as <i>Casuarina equisetifolia</i> at the southern half of the site should be removed. Two small Casuarina trees can be removed immediately as keeping them will create non hospitable environment for native plants to grow in and thus permanent bare areas under the tree will be created offering little to no habitat or amenity value.
	Apply Herbicide	3 x per year in 2016 then 2 x per year. end of April beginning of May, July and September	ToC	Refer to maps for details of weed infestation - use digital version maps to quickly inspect type of weeds and distribution. Ensure whole site is covered whenever possible. Specific attention to be given to Couch at the northern end of the site. Use <b>grass selective herbicide prior to using Glyphosate</b> so that Couch is controlled without affecting native vegetation.
	Eradicate Black Flag	1 x per year in June	ToC / Contractor	Wipe with Glyphosate as outlined in original <b>NAMP (Table 45) or in Appendix 6.</b>
<b>Fence repair</b>	Check and repair any damage to fencing	Regular inspections. Repair rusted fencing on 2016 or as required	ToC / Contractor	Seek help from CCA volunteers for monitoring. Organise contractor to conduct repairs.
<b>Erosion control</b>	Monitor wind erosion and human induced erosion / trampling and implement preventative measures	During regular inspections	ToC	Plant densely along access pathway and use plant guards
<b>Planting</b>	Order plants from nursery	August	ToC / CCA	Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity according to available budget. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species.
	Order plant guards and fertiliser tablets	March	ToC	Check with nursery that the stock will be available and ready for planting. Not all plants will require guards. ~ 20% of plants can have guards. One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organised meeting with schedule of planned works
	Ensure water is available to water plants upon planting	April	ToC	Water truck availability, water connection to the mains water supply, hoses etc. Check availability of these on weekends when CCA volunteers are likely to work.
	Install plants	last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is 'visible'. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Create wells around each plant to facilitate easier watering. Use fertiliser tablet (1 per plant) as per manufacturers specifications when planting
	Install plant guards	May - June	CCA, ToC	Install plant guards as recommended. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen easier during maintenance and that plant establishment success can be monitored.
	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal (depending on condition).
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect the site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.



# SITE INFORMATION – Dutch Inn - S5

## Changes in Vegetation since 2008



May 2008



January 2014

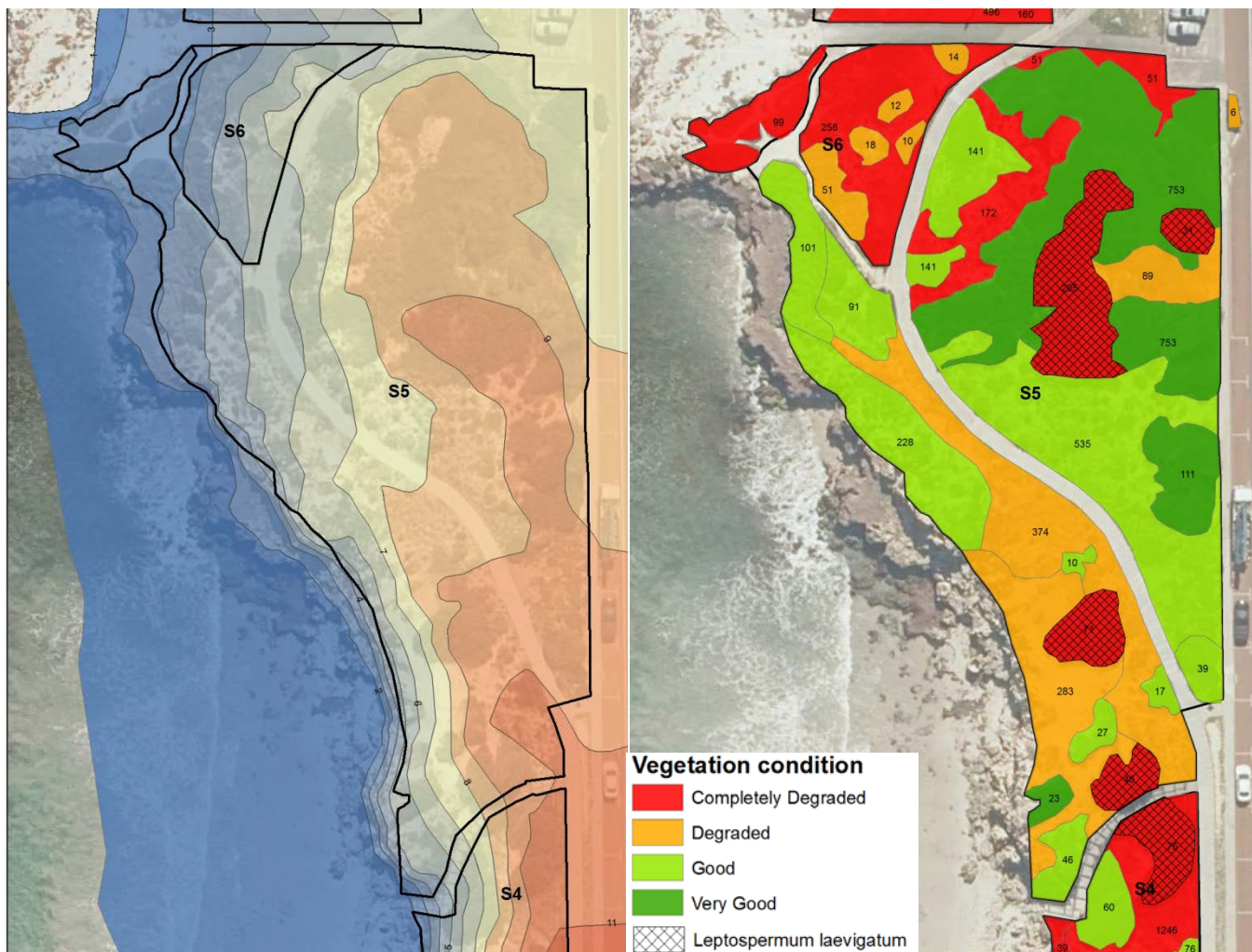
→ Indicate change in vegetation

- Decrease in woody weed cover and increase native plant density and diversity
- Revegetated areas to the south and west
- Increase in amenity value

### BASELINE (2015) VEGETATION CONDITION

Very Good	26%
Good	36%
Degraded	22%
Completely Degraded	17%

Large sections of site revegetate and have a potential to transition into a high quality coastal heath provided weed control is conducted in a timely fashion.



**Note:** Numbers inside polygons denote area in m<sup>2</sup>  
**Hatched area:** Coast Teatree

**NATIVE VEGETATION**

Cliff edge has *Frankenia pauciflora* *Leucophyta brownii*, *Atriplex isatidea*, *Scaevola crassifolia* and *Spinifex longifolius* with Couch as dominant species whereas upland vegetation predominantly consists of *Scaevola crassifolia* and planted *Olearia axillaris*.

**WEEDS**

- Dominant weeds** Majority of site is Couch infested with works areas located to the north west of the site.
- Other weeds:** Dune Onion Weed, Carnation weed, some annual grasses and a low amount of Sea Spinach.
- Woody Weeds:** Coast Teatree to the north of the site.





Distribution of high priority weeds at Dutch Inn – S5

**PEST FAUNA**

Nil.



## EROSION AND SLOPE STABILITY ISSUES

Low level wind erosion and informal path at the cliff's edge to the south west of the site.

## PAST MANAGEMENT WORK – chronology 2008 – 2014

**General maintenance:** Yes

**Weed Control:** Yes – woody weed and chemical - infrequent

**Planting:** Yes

## CONDITION OF INFRASTRUCTURE

**Pathway:** S5 – Good Condition

**Signage:** Good

**Fencing:** Ringlock fencing requires repair – retension and replace along cliff edge.



## MAINTENANCE AND RESTORATION PRIORITIES

**Restoration Priority:** High

**Maintenance Priority:** High

BASIC STATISTICS – Dutch Inn-S5	
<b>Total AREA (m<sup>2</sup>)</b>	<b>3742</b>
<b>Completely degraded</b>	<b>576</b>
<b>Degraded</b>	<b>752</b>
<b>Good</b>	<b>1235</b>
<b>Very Good</b>	<b>887</b>
<b>Total vegetated area (m2)</b>	<b>3450</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>292</b>
<b>Woody weeds removal</b>	<b>353</b>
<b>Weed areas including woody weeds</b>	<b>665</b>
<b>Area to stabilise by coir mat or jute matt</b>	
<b>Area to plant (m<sup>2</sup>)</b>	<b>957</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>2871</b>
<b>Supplementary Plants required (30%)</b>	<b>861</b>
<b>Fencing (linear metres)</b>	<b>0</b>
<b>Sand trap fencing (linear metres)</b>	<b>0</b>

**NOTE:** Ensure usage of limestone cliff species. Plant bare areas densely to facilitate faster coverage.



**AIMS OF REVEGETATION FOR 2015 - 2019**

- **No Woody weeds** by 2017
- **All planting completed** by winter 2017
- **<5% of the area covered by weeds** by 2019
- **<2 % Couch** by 2019

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- **Install new bollards / fence at the top of the dune to limit entry to site** by 2017

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Strengthen ecological links between north and south link with S7 High Priority area S7.
- Improve amenity value and develop low level weed control for upper areas of Site S6 so that a less fragmented link can be made between S5 and S7.



**View of Couch infested areas and a sofa at the top of the dune!**



**View of the dune undergoing restoration (left) and the remnant cliff vegetation (right)**

## IMPLEMENTATION PLAN - Dutch Inn - S5

### General Maintenance Prior and Post Restoration

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of litter appropriately. Collect and dispose of sofa. Consider temporary fencing of the area if it is frequently trampled.
<b>Weed Control</b>	Manually remove weeds growing over native plants	Every 2 months	ToC, CCA	Inspect. Organise a work bee. Weed Sea Spinach, Carnation Weed event small tufts of Couch where needed so no of target damage occurs during chemical spraying,
	Apply herbicide	2 x per year April and July	ToC	Apply herbicide to Couch, Sea Spinach and other weeds on site. Start off with a grass selective herbicide and move to Glyphosate.
<b>Fence repair</b>	Re-tighten fencing wire and check posts	Immediately , then follow up via regular inspections	ToC/ Contractor	Organise repair. Monitor for damage.
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.
<b>Restoration</b>				
<b>Purchasing and Contractor Appointment</b>	Ensure all orders and contractor appointments have been made	6 months – 1 year prior to start o works	ToC	Appoint contractors for chemical weed control, erosion control works and planting if desired. Purchase materials required and order plants to maximise budget available. <b>Order plants</b> as soon as possible and order full amount or as many plants as possible. Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity as specified. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species. Also order tree guards and fertiliser tablets (1 tablet per plant) and ¼ of guards for seedlings.
<b>Fencing</b>	Install temporary fencing as required	One - two weeks prior to start of works	ToC / Contractor	Install appropriate fencing and signage to inform public of planned works.
<b>Weed control</b>	Apply Herbicide – blanket and spot spray	1 x prior to restoration. Best done in June / July	ToC / Contractor	Apply blanket spray of Glyphosate to the weed infested areas containing no native vegetation. Spot spray around native vegetation.
	Manual weeding	1 x prior to erosion control works	Contractor / ToC / CCA	Remove Coastal Tea Tree and remove all material off site for disposal.
<b>Site clean-up</b>	Remove all loose and dry plant debris to prepare site for matting	Prior to jute matting	Contractor / ToC	Collect all debris and take off site.
<b>Erosion control</b>	Install jute matt per manufacturer's specifications.	After Site Clean-up	Contractor / ToC	Install fencing or signage to deter public from entering the site. Plant densely. <b>DO not install jute matt in already mulched areas (works are in progress as this document is compiled).</b>
<b>Planting</b>	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organise meeting with schedule of planned works and determine best time to plant.
	Ensure water is available to water plants upon planting	April	ToC	Check availability of water for irrigation and organise watering as truck or similar to be available.
	Install plants and plant guards	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Cut 20 cm holes into jute matting and fold the cut corners under the stretched matting. Plant each seedling with one fertiliser tablet and create a well around the plant to facilitate watering later on. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Install plant guards to ¼ of planted stock mainly in the areas that could be easily accessed by the public and in very exposed areas.



# SITE INFORMATION – Dutch Inn - S7

## Changes in Vegetation since 2008



May 2008



January 2014

➡ Indicate changes in vegetation

- Woody weeds removed
- Native species cover has increased
- Increase in ecological and amenity value

### BASELINE (2015) VEGETATION CONDITION

Very Good	24%
Good	2%
Degraded	54%
Completely Degraded	20%



A small scale project that is easy and economical to achieve. Couch control is of high importance. The site was prepared for 2015 planting season by spraying weeds in May 2015.

**NATIVE VEGETATION**

The Very Good condition vegetation consists of *Scaevola crassifolia* and *Leucophyta brownii* surrounded by revegetated area with the same species, *Olearia axillaris* and *Spinifex longifolius*.

**WEEDS**

- Dominant weeds** Couch is very dominant together with Sea Spinach
- Other weeds:** Dune Onion Weed.
- Woody Weeds:** Nil



Distribution of high priority weeds for Dutch Inn – S7



**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

The slope is gently undulating and is stable.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes – most recent in May 2015

**Planting:** Yes, in Winter 2014

**CONDITION OF INFRASTRUCTURE**

**Pathway:** S7 – Good to poor condition, not as frequently used as the northern access points.

**Signage:** Good

**Fencing:** Good condition. Access point bollards in good condition.

**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** High

**Maintenance Priority:** High

**BASIC STATISTICS – Dutch Inn -S7**

<b>Total AREA (m<sup>2</sup>)</b>	<b>960</b>
<b>Completely degraded</b>	<b>187</b>
<b>Degraded</b>	<b>496</b>
<b>Good</b>	<b>21</b>
<b>Very Good</b>	<b>221</b>
<b>Total vegetated area (m<sup>2</sup>)</b>	<b>925</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>35</b>
<b>Woody weeds removal</b>	<b>0</b>
<b>Weed areas including woody weeds</b>	<b>187</b>
<b>Area to stabilise by coir mat or jute matt</b>	
<b>Area to plant (m<sup>2</sup>)</b>	<b>222</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>6661</b>
<b>Supplementary Plants required (30%)</b>	<b>200</b>
<b>Fencing (linear metres)</b>	<b>88 (temporary if needed)</b>

**AIMS OF REVEGETATION FOR 2015 - 2019**

- All planting completed by winter 2017
- <5% of the area covered by weeds by 2019
- <2 % Couch by 2019

## AIMS FOR CAPITAL WORKS - INFRASTRUCTURE

- Install new access point / boardwalk, and bollards / fence at the top of the dune to fit in with the rest of the foreshore.

by 2019

## OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT

- Strengthen ecological links between north and south link.
- Improve amenity value and provide impetus to restore adjacent areas S8 and S9.



View of Couch infested areas at the top of the dune looking south (top image) and View looking over Very Good condition vegetation to Area S6 (bottom).



## IMPLEMENTATION PLAN - Dutch Inn - S7

### General Maintenance Prior and Post Restoration

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of litter appropriately. Collect and dispose of sofa. Consider temporary fencing of the area if it is frequently trampled.
<b>Weed Control</b>	Manually remove weeds growing over native plants	Every 2 months	ToC, CCA	Inspect. Organise a work bee. Weed Sea Spinach, around planted seedlings
	Apply herbicide	2 x per year April and July	ToC	Apply herbicide to Couch, Sea Spinach and other weeds on site. Use Glyphosate.
<b>Fence repair</b>	Check wire and posts for any damage and repair	After regular inspections / as needed	ToC/ Contractor	Organise repair. Monitor for damage.
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine number of supplementary plants required.
<b>Restoration</b>				
<b>Purchasing and Contractor Appointment</b>	Ensure all orders and contractor appointments have been made	6 months – 1 year prior to start o works	ToC	Appoint contractors for chemical weed control, erosion control works and planting if desired. Purchase materials required and order plants to maximise budget available. <b>Order plants</b> as soon as possible and order full amount or as many plants as possible. Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity as specified. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species. Also order tree guards and fertiliser tablets (1 tablet per plant) and ¼ of guards for seedlings.
<b>Fencing</b>	Install temporary fencing as required	One - two weeks prior to start of works	ToC / Contractor	Install appropriate fencing and signage to inform the public of planned works.
<b>Weed control</b>	Apply Herbicide – blanket and spot spray	1 x prior to restoration. Best done in June / July	ToC / Contractor	Apply blanket spray of Glyphosate to the weed infested areas containing no native vegetation. Spot spray around native vegetation.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organise meeting with the schedule of planned works and determine the best time to plant.
	Ensure water is available to water plants upon planting	April	ToC	Check availability of water for irrigation and organise watering (e.g. water truck or similar) to be available.
<b>Planting</b>	Install plants and plant guards	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Plant each seedling with one fertiliser tablet and create a well around the plant to facilitate watering later on. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Install plant guards to ¼ of planted stock mainly in the areas that could be easily accessed by the public and in very exposed areas.

# SITE INFORMATION – Vlamingh Reserve - S1

## Changes in Vegetation since 2008



May 2008



January 2014

Indicate changes in vegetation

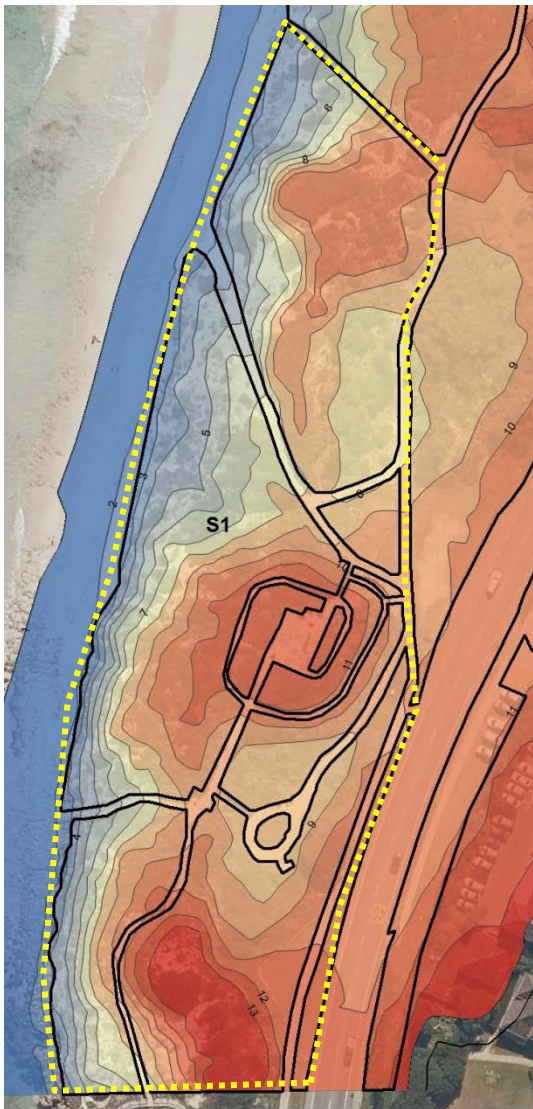
- Substantial increase in native vegetation cover and increase in natural areas via extensive planting to the east and north of the memorial
- Lower amount of woody weeds
- Increase in habitat value
- Decrease in Coast Teatree Cover

### BASELINE (2015) VEGETATION CONDITION

Very Good	39%
Good	15%
Degraded	27%
Completely Degraded	19%

Large proportion of revegetated area has been mapped as degraded due to proliferation of Couch and other weeds such as Sea Spinach.





**Note:** Numbers inside polygons denote area in m<sup>2</sup>

**NATIVE VEGETATION**

Mixed native remnant and planted shrubs of *Scaevola crassifolia*, *Olearia axillaris*, *Rhagodia baccata*, *Acacia rostellifera* and *Acacia cyclops* with *Spinifex longifolius*

**WEEDS**

- Dominant weeds**      Thick Couch in the rehabilitated area east and south of the memorial. Sea Spinach also prominent and covers most shrubs.
- Other weeds:**        Dune Onion Weed, Black Flag, Carnation Weed, Pelargonium, Annual Veldt grass
- Woody Weeds:**      Coast Teatree.





Distribution of high priority weeds at Vlamingh Reserve – S1

**PEST FAUNA**

Nil.



**EROSION AND SLOPE STABILITY ISSUES**

**Wind erosion** at the southernmost end of site where some of the Coast Teatrees have been removed. The erosion has not changed significantly since 2008.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes in the northern sector but not around memorial

**Planting:** Yes , northern end of site along the path.

**CONDITION OF INFRASTRUCTURE**

**Pathway:** S1 – Needs upgrade – upper part of access is damaged. Path surrounding the memorial itself also needs upgrade.

**Signage:** Needs upgrade

**Fencing:** Ring lock fencing is in poor condition and should be replaced in the long term.



**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** High

**Maintenance Priority:** High

BASIC STATISTICS – Vlamingh Reserve - S1	
<b>Total AREA (m<sup>2</sup>)</b>	<b>11090</b>
<b>Completely degraded</b>	<b>2056</b>
<b>Degraded</b>	<b>2892</b>
<b>Good</b>	<b>1561</b>
<b>Very Good</b>	<b>4155</b>
<b>Total vegetated area (m2)</b>	<b>10664</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>426</b>
<b>Woody weeds removal</b>	<b>1214</b>
<b>Weed areas including woody weeds</b>	<b>2181</b>
<b>Area to stabilise by coir mat or jute matt</b>	<b>500</b>
<b>Area to plant (m<sup>2</sup>)</b>	<b>2607</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>7821</b>
<b>Supplementary Plants required (30%)</b>	<b>2346</b>
<b>Fencing (linear metres)</b>	<b>134</b>
<b>Sand trap fencing (linear metres)</b>	<b>40</b>

### AIMS OF REVEGETATION FOR 2015 - 2019

- <5% of the area covered by weeds by 2018
- 80% of the area is in Very Good condition by 2019
- <2% Couch is present at the eastern end of site by 2019
- No Coast Teatrees present by 2019

### AIMS FOR CAPITAL WORKS - INFRASTRUCTURE

- Access way bollards / fencing are upgraded by 2019
- Pathway to / surrounding the memorial is upgraded by 2019

### OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT

- Investigate possibility of working with Town of Mosman Park to improve habitat value and amenity of the southernmost section of the site. This will also add statement to Town's commitment to natural areas management and sustainability.
- Investigate opportunities for restoring further north to link to central and northern Cottesloe natural areas.
- Implement intensive weed control in the eastern area short term to gain benefits for long term sustainability of this area.

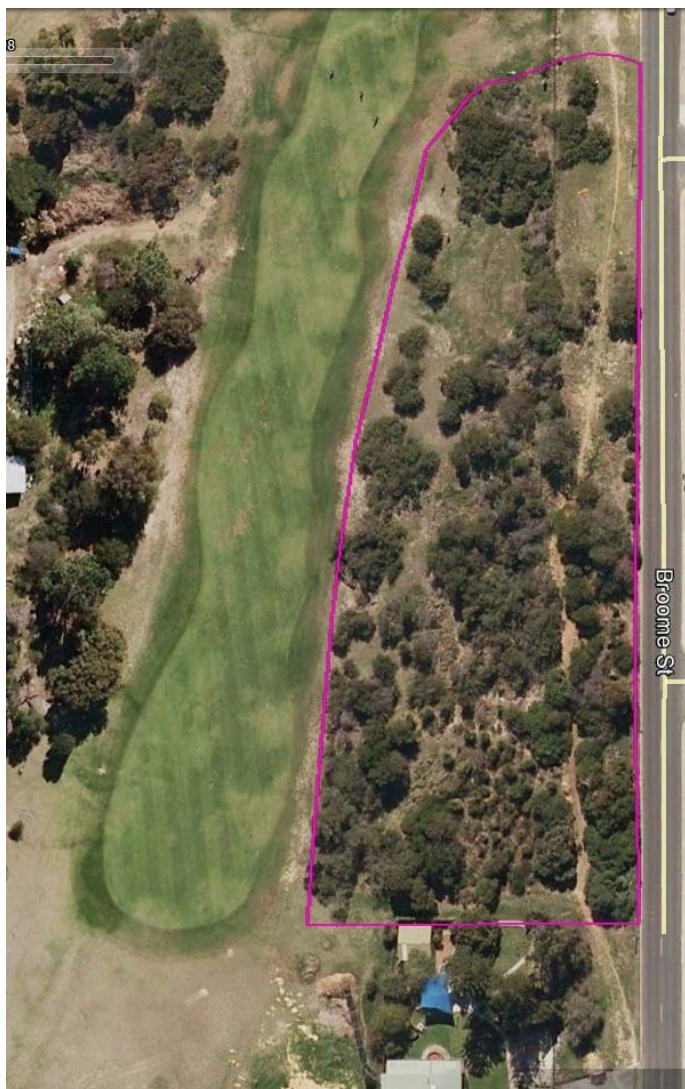


**IMPLEMENTATION PLAN - Vlamingh Reserve - S1**

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of any litter found. For the majority of site two inspections and litter collections can be made annually if the litter is not visible.
<b>Weed Control</b>	Manually remove weeds growing over native plants and fencing	Every 2 months	ToC, CCA	Inspect. Organise a workbee for manual weeding of Sea Spinach. For woody weeds removal organise contractor to remove Coast Tea Tree and other non native trees such as <i>Casuarina equisetifolia</i> at the eastern end of site.
	Apply Herbicide	4 x per year in 2016 then 2 x per year. end of April beginning of May, July and September	ToC	Refer to maps for details of weed infestation - use digital vegetation condition map to quickly inspect type of weeds present and their distribution. Whenever possible ensure whole site is covered each time weed control is done. Specific attention is to be given to Couch at the northern end of the site. Use <b>grass selective herbicide prior to using glyphosate</b> so that Couch is controlled without affecting native vegetation.
	Eradicate Black Flag	1 x per year in June	ToC / Contractor	Wipe with Glyphosate as outlined in <b>original NAMP document Table 45 and in Appendix 6.</b>
<b>Fence repair</b>	Check and repair any damage to fencing	Regular inspections. Repair rusted fencing as required	ToC / Contractor	Seek help from CCA volunteers for monitoring. Organise contractor to conduct repairs.
<b>Erosion control</b>	Monitor wind erosion and human induced erosion / trampling and implement preventative measures	During regular inspections	ToC	Plant densely along access pathway and use plant guards
	Install Jute matting	After removal of Coast Teatrees and prior to planting	ToC/ Contractor	Install jute matt in the areas that are likely to erode and or have issues with weeds.
<b>Planting</b>	Order plants from nursery	August	ToC / CCA	Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity according to available budget. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species.
	Order plant guards and fertiliser tablets	March	ToC	Check with nursery that the stock will be available and ready for planting. Not all plants will require guards. ~ 20% of plants can have guards. One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organised meeting with schedule of planned works
	Ensure water is available to water plants upon planting	April	ToC	Water truck availability, water connection to the mains water supply, hoses etc. Check availability of these on weekends when CCA volunteers are likely to work.
	Install plants	last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is 'visible'. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Create wells around each plant to facilitate easier watering. Use fertiliser tablet (1 per plant) as per manufacturers specifications when planting
	Install plant guards	May - June		Install plant guards as recommended. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen easier during maintenance and that plant establishment success can be monitored.
	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal (depending on condition).
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine number of supplementary plants required.

# SITE INFORMATION – Cottesloe Native Gardens - CNG

## Changes in Vegetation since 2008



May 2008



January 2014

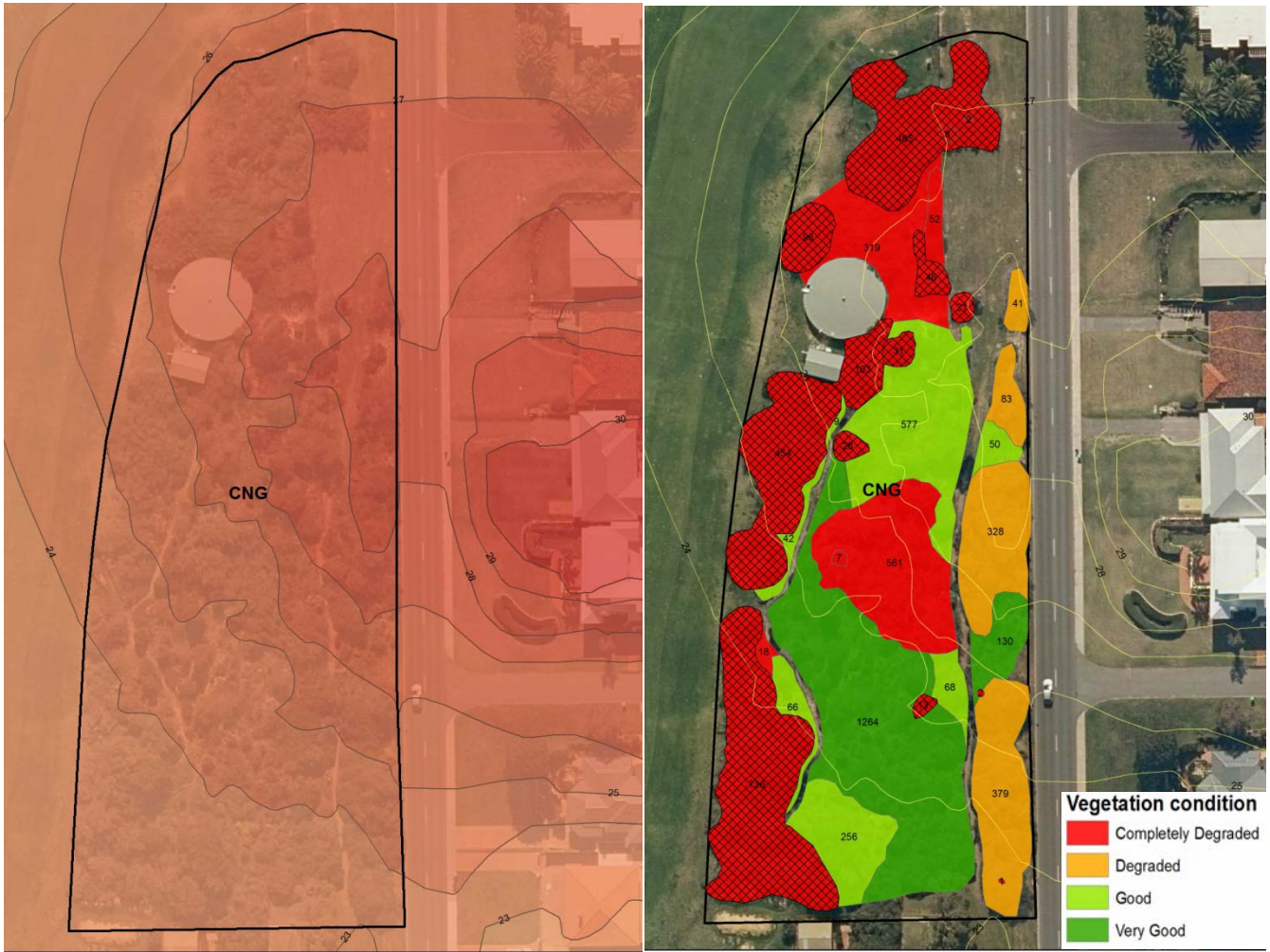
- Increase in native vegetation cover and diversity
- Reduction in Coast Teatree Cover (additional 500m2 was removed in March 2015 – not shown above)
- Increase in amenity value

### BASELINE (2015) VEGETATION CONDITION

Very Good	22%
Good	17%
Degraded	13%
Completely Degraded	48%

This natural areas is most diverse in Cottesloe and holds an important stand of grass trees and other remnant native flora.





**Note:** Numbers inside polygons denote area in m<sup>2</sup>

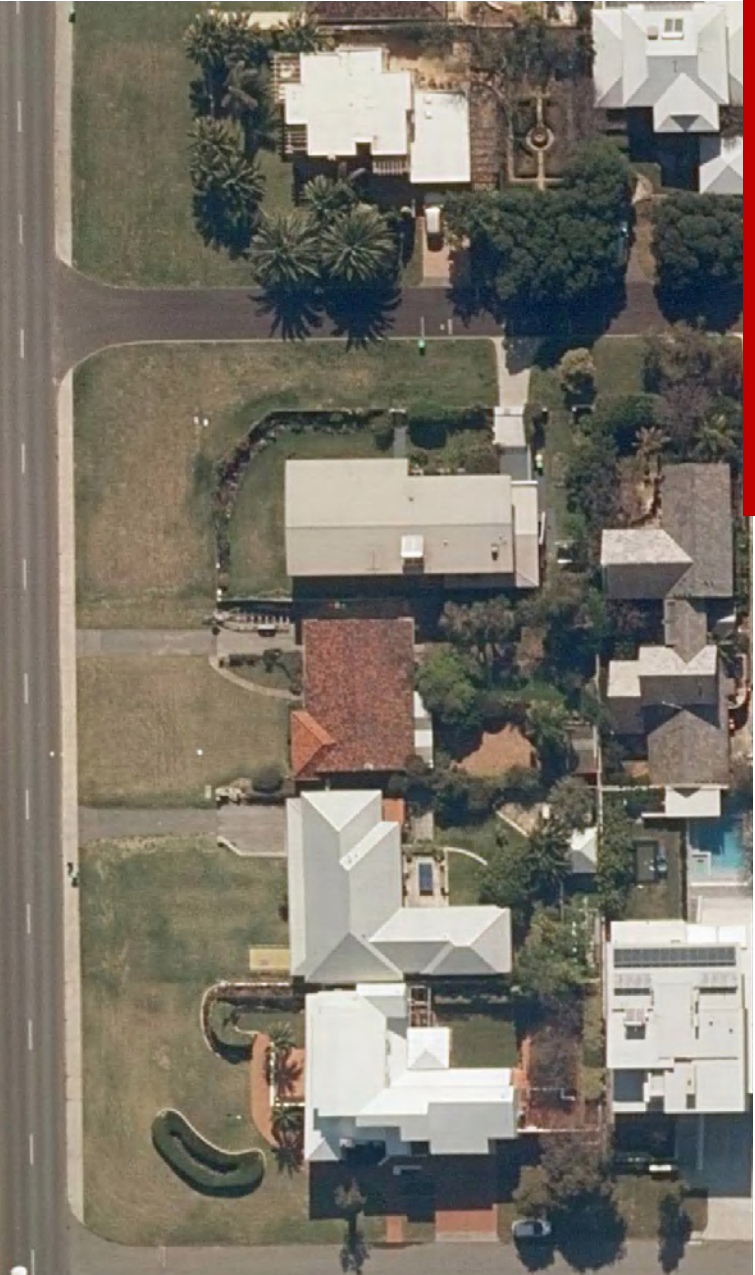
**NATIVE VEGETATION**

Mixed native remnant and planted shrubs dominated by *Xanthorrhoea preissii* with mixed shrubs including *Grevillea preissii*, *Acacia lasiocarpa*, *Banksia sessilis*, *Melaleuca systema*, *Acacia xanthina*, etc.

**WEEDS**

- Dominant weeds**      Annual and Perennial Veldt, Lachenalia, Carnation Weed, Black Flag, Couch.
- Other weeds:**        Annual grasses, Freesia, Dune Onion weed
- Woody Weeds:**      Coast Teatree, Sydney Golden Wattle, Geraldton wax, Brazilian pepper (*Schinus terebinthifolius*)





**Legend**

- Brazilian Pepper\_*Schinus terebinthifolius*
- Sydney Golden Wattle\_*Acacia longifolia*
- Freesia\_*Freesia alba x leichtlinii*
- Annual Veldt and Beard Oat
- Black Flag\_*Ferraria crispa*
- Bridal Creeper\_*Asparagus asparagoides*
- Coast Teatree\_*Leptospermum laevigatum*
- Geraldton Carnation Weed\_*Euphorbia terracina*
- *Pelargonium capitatum*
- Yellow and Red Soldiers\_*Lachenalia* spp

Distribution of high Priority Weeds at Cottesloe Native Gardens - CNG



**PEST FAUNA**

Rats

**EROSION AND SLOPE STABILITY ISSUES**

Low level erosion due to recent Coast Teatree removal.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** Yes – ongoing by CCA

**Planting:** Yes - ongoing

**CONDITION OF INFRASTRUCTURE**

**Pathways:** Pathways are informal sandy, grassy or mulch covered in places.

**Signage:** Nil

**Fencing:** Nil.



**Informal path sections showing different surface (top) and a photo of the recently cleared Coast Teatree patch (bottom) awaiting revegetation**

**MAINTENANCE AND RESTORATION PRIORITIES**

**Restoration Priority:** Medium

**Maintenance Priority:** High

<b>BASIC STATISTICS – Cottesloe Native Gardens - CNG</b>	
<b>Total AREA (m<sup>2</sup>)</b>	<b>8344</b>
<b>Completely degraded</b>	<b>2981</b>
<b>Degraded</b>	<b>831</b>
<b>Good</b>	<b>1068</b>
<b>Very Good</b>	<b>1394</b>
<b>Total vegetated area (m2)</b>	<b>6274</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>2070</b>
<b>Woody weeds removal</b>	<b>2076</b>
<b>Weed areas including woody weeds</b>	<b>2420</b>
<b>Area to stabilise by coir mat or jute matt</b>	<b>0</b>
<b>Area to plant (m<sup>2</sup>)</b>	<b>4490</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>13470</b>
<b>Supplementary Plants required (30%)</b>	<b>4041</b>
<b>Fencing (linear metres)</b>	<b>To be determined as necessary</b>

#### AIMS OF REVEGETATION FOR 2015 - 2019

- <5% of the area covered by weeds by 2019
- 70% of the area is in Very Good condition by 2019
- <2% Couch is present at the throughout the site by 2017
- All woody weeds within current work area removed by 2017

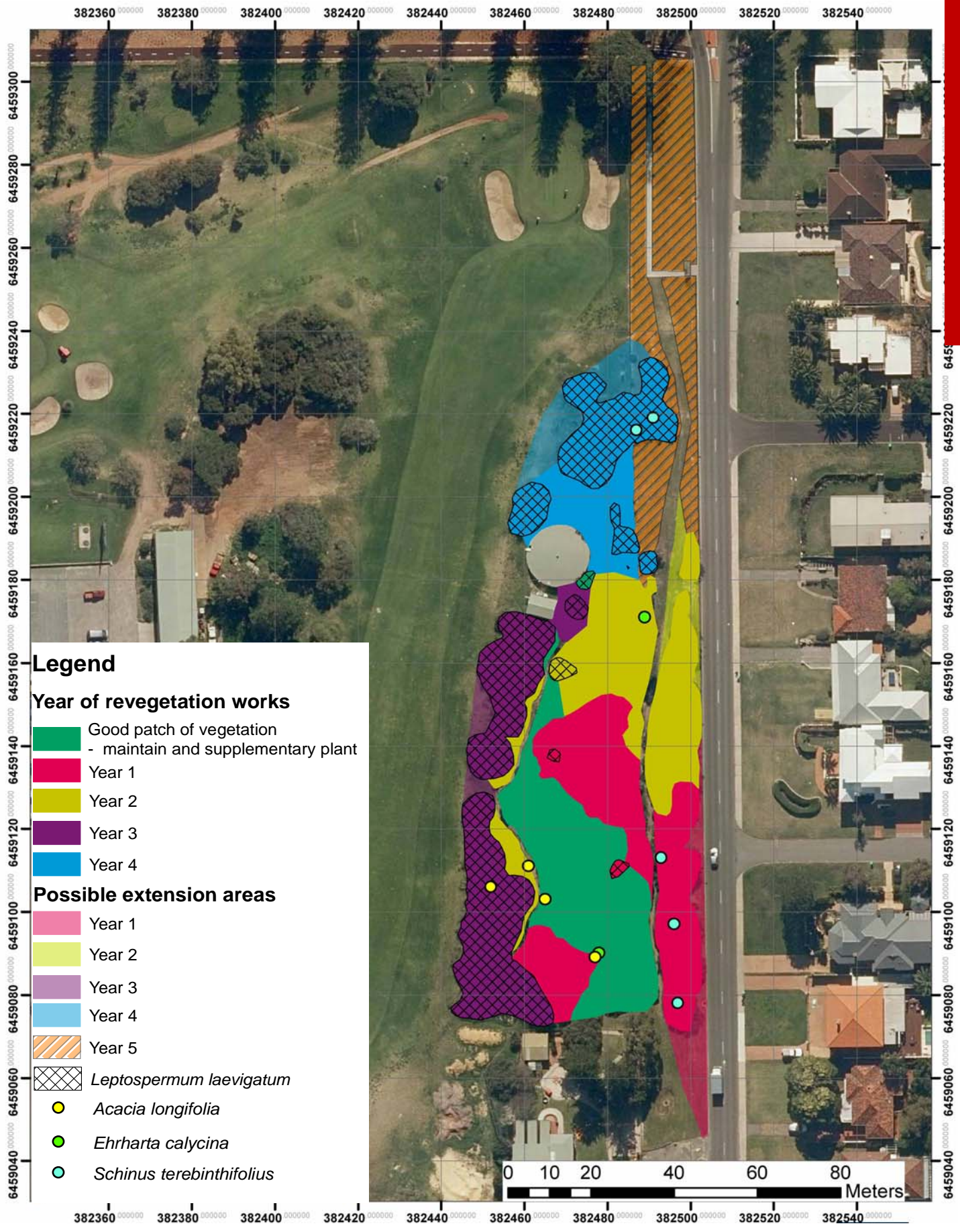
#### AIMS FOR CAPITAL WORKS - INFRASTRUCTURE

- Mulched upper path by 2019 or plan long term
- Remove Coast Teatrees – some are very large by 2019

#### OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT

- Link site to west with Site S15 Mudurup Rocks buffer plantings along the Golf course boundary.
- Continue verge planting along Broome Street with a mulch path through the bushland area. The verge works would involve planting of low shrubs and herbs / sedges to comply with the Town's requirements, but will draw heavily on the species list available for CNG site. The species growing on the verge may be stunted due to soil the depth to limestone (north of the site) and this will need to be examined closely prior to investing into revegetation of these areas. For proposed sequence of works see figure below.





Opportunities for extension of natural areas and suggestion for staging of works

## IMPLEMENTATION PLAN – Cottesloe Native Gardens - CNG

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Weekly	ToC, CCA	Inspect weekly along pathways and collect / dispose of any litter found. CCA can assist with litter collection during regular workbees.
<b>Site preparation</b>	Remove weedy Acacia and Brazilian pepper Remove some of the dead vegetation	1 month prior to planting (April-May) ASAP	ToC, CCA	Cut and poison stumps of Sydney Golden Wattle and Brazilian Pepper ASAP. CCA to help with identifying locations. Remove or cut down some of the bushy dead shrubs to allow for new planting to occur in their place. Cut material can be left on site if unobtrusive / does not decrease amenity value.
<b>Weed Control</b>	Manually remove Weeds growing over native plants prior to chemical control	Every 2 months	ToC, CCA	Inspect. Organise a workbee for manual weeding of select weeds such as Geraldton Carnation Weed and some grasses.
	Apply Herbicide (grass selective 1 x and non selective 2 x per year)	3 x per year end of <b>April</b> beginning of <b>May</b> , <b>July</b> and <b>September</b>	ToC	Refer to maps for details of weed infestation - use digital weed mapping to quickly inspect type of weeds and distribution. Ensure whole site is covered each time whenever possible. Specific attention is to be given to Veldt Grass, all geophytes and Couch.  <b>Use grass selective herbicide 1x and glyphosate 2 x per year to target a number of species.</b>
	Eradicate / Control Black Flag	1 x per year in June	ToC / Contractor	Wipe with Glyphosate <b>as outlined Appendix 6 and in original NAMP Table 45.</b>
<b>Pest (Rat) Control</b>	Monitor to investigate if baiting is needed to control rats	End of summer or early autumn when food is scarce	ToC / Contractor	Research and use most appropriate baiting technique for the area. CCA can help with monitoring / sighting recordings.
<b>Erosion control</b>	Monitor human induced erosion / trampling and implement preventative measures	During regular inspections	ToC	Plant densely along access pathway and use plant guards.
<b>Planting</b>	Order plants from nursery	August	CCA, ToC	Use a plant list generated for CNG site to determine which plants to collect seed for and order from the nursery. Provenance is very important for this area so locally collected seed is best.
	Order plant guards and fertiliser tablets	March	ToC, CCA	Check with the nursery that the stock will be available and ready for planting. Not all plants will require guards. ~ 25% of plants can have guards. One 7 - 10g native plant tablet per plant is sufficient.
	Schedule planting days	March	CCA, ToC	Organised meeting with schedule of planned works.
	Ensure water is available to water plants upon planting	April	ToC	Water truck availability, water connection to the mains water supply, hoses, etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is 'visible' and complementary. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Create wells around each plant to facilitate easier watering. Use fertiliser tablet (1 per plant) as per manufacturers specifications when planting
	Install plant guards	May - June	CCA / ToC/ Contractor	Install plant guards as recommended. For plants without guards install one bamboo stake approximately 5 - 10 cm away from the plant so that the plant can be seen easier during maintenance and that plant establishment success can be monitored.
<b>Monitoring</b>	Remove plant guards	March - April or when plants are filling the guard space but not 'overflowing'	CCA, ToC	Remove plant guards for reuse or disposal (depending on condition).
	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly Throughout the year but mainly during May - March for plant watering requirements	CCA	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect the site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.



# SITE INFORMATION – Peters Pool - N1

## Changes in Vegetation since 2008



May 2008

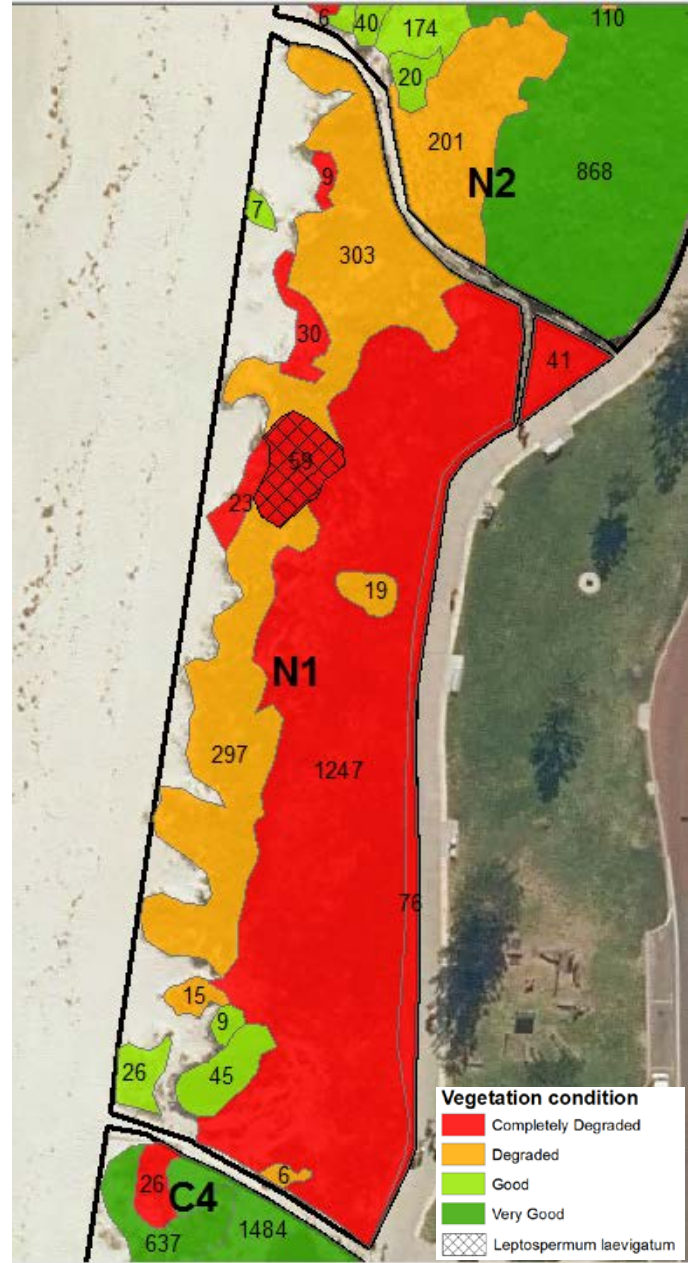


January 2014

- Increase in weed cover and density particularly density of Couch on the upper slope
- Increase in woody weed cover
- Decrease in amenity value particularly after restoration of dunes to the north (Bryan Way) and to the south C4 (Napier St Fore dune)
- Increase in *Melaleuca lanceolata* growth to the south as well as wind erosion around this tree

### BASELINE (2015) VEGETATION CONDITION

Very Good	0%
Good	4%
Degraded	29%
Completely Degraded	67%



**Note:** Numbers inside polygons denote area in m<sup>2</sup>  
**Hatched area:** Coast Teatree

**NATIVE VEGETATION**

*Spinifex longifolius* along the foreshore and lower end of the access path. Few very small patches also present slightly higher up slope. *Melaleuca lanceolata* tree to the south is in good condition.

**WEEDS**

- Dominant weeds** Couch and Sea Spinach for the majority of site with Couch and Kikuyu being dominant at the top of the slope
- Other weeds:** Pelargonium, Dune Onion Weed, Oxalis, Marram Grass and Sea Wheat Grass.
- Woody Weeds:** Coast Teatree to the north of the site





Distribution of Priority Weeds for Peters Pool - N1

**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

Wind erosion present around the *Melaleuca lanceolata* tree.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

General maintenance: Yes

Weed Control: None

Planting: None

**CONDITION OF INFRASTRUCTURE**

**Pathway:** N1 – Moderate to poor Condition access (additional ‘branch’ pathway present joining onto N1 (see image below)

**Signage:** Good

**Fencing:** Pine bollards along access path in moderate condition



**MAINTENANCE AND RESTORATION PRIORITIES**

Restoration Priority: High

Maintenance Priority: Medium to Low

BASIC STATISTICS – Peters Pool - N1	
<b>Total AREA (m<sup>2</sup>)</b>	<b>2594</b>
<b>Completely degraded</b>	<b>1485</b>
<b>Degraded</b>	<b>640</b>
<b>Good</b>	<b>87</b>
<b>Very Good</b>	<b>0</b>
<b>Total vegetated area (m2)</b>	<b>2212</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>382</b>
<b>Woody weeds removal</b>	<b>59</b>
<b>Weed areas including woody weeds</b>	<b>1485</b>
<b>Area to stabilise by coir mat or jute matt</b>	<b>1600</b>
<b>Area to plant (m<sup>2</sup>)</b>	<b>1867</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>5601</b>
<b>Supplementary Plants required (30%)</b>	<b>1680</b>
<b>Fencing (linear metres)</b>	<b>0</b>
<b>Sand trap fencing (linear metres)</b>	<b>0</b>



**NOTE: Suggested number of plants is considering denser planting of *Spinifex* and not solely shrubs that can be planted at a lower density. Of the total number of plants recommended 40% is for *Spinifex longifolius*. Thick band should be maintained to approximately 7m AHD (see topography map for indicative levels).**

**AIMS OF REVEGETATION FOR 2015 - 2019**

- No Woody weeds by 2016
- No Marram or Sea Wheat Grass present (or less than 20 plants each) by 2016
- All planting completed by winter 2018
- <5% of the area covered by weeds by 2019

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- Upgrade path N1 by 2017
- Complete necessary earthworks by 2017

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Implement restoration works in this section to strengthen links between sites N2 and C4 (north and south of this site respectively). These sites have been rehabilitated and are in good condition.
- Strengthen links with Grant Marine Park, a site with vegetation in good condition.
- Opportunity to extend viewing area as indicated in the image below. This would be a more environmentally and very likely maintenance wise option than the proposed boardwalk.



**View of N1 dune from the North west end looking south. Coast Teatree and Marram Grass in foreground and Spinifex along the base of the dune with *Melaleuca lanceolata* mid slope at the southern end**

# IMPLEMENTATION PLAN – Peters Pool – N1

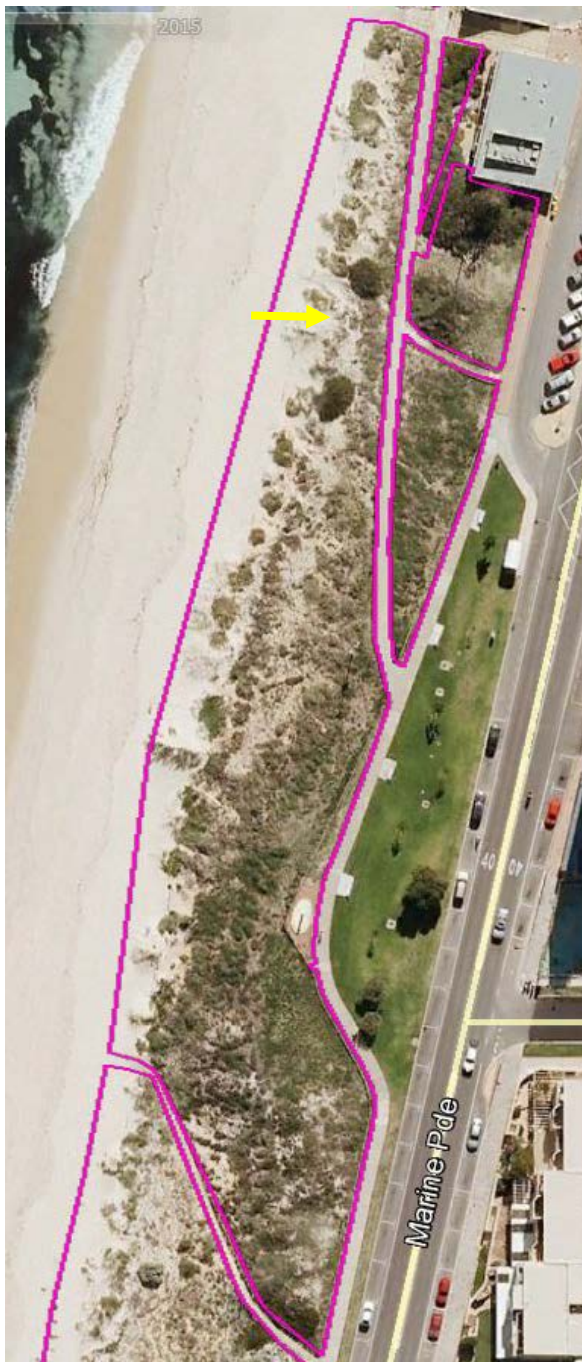
## General Maintenance Prior and Post Restoration

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of litter appropriately. For the majority of site two inspections and litter collections can be made if the litter is not visible.
<b>Weed Control</b>	Manually remove weeds growing over Spinifex along pathways and foreshore	Every 2 months	ToC, CCA	Inspect. Organise a workbee if manual weeding would take a long time. Work with no more than 10 people and work in a line parallel to shore to examine the entire site.
	Apply herbicide	2 x per year end of <b>April</b> / beginning of <b>May</b> and in <b>July</b>	ToC	Apply herbicide to Pelargonium at the top of the slope near N3 access pathway.
	Eradicate Marram Grass	1 x per year in July	ToC / Contractor	Cut and remove Marram Grass and wipe / spray with Glyphosate.
	Eradicate Sea Wheat Grass	1 x per year in July	ToC / CCA/ Contractor	Cut and remove large plants and wipe with Glyphosate. Manually dig out any small plants.
<b>Fence repair</b>	Check and repair any damage to fencing	Weekly / during regular refuse collection	ToC	Drive / walk by. Seek help from CCA volunteers for monitoring
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine the number of supplementary plants required.
<b>Restoration</b>				
<b>Purchasing and Contractor Appointment</b>	Ensure all orders and contractor appointments have been made	6 months – 1 year prior to start o works	ToC	Appoint contractors for chemical weed control, erosion control works and planting if desired. Purchase materials required and order plants to maximise budget available. <b>Order plants</b> as soon as possible and order full amount or as many plants as possible. Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity as specified. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species. Also order tree guards and fertiliser tablets (1 tablet per plant) and ¼ of guards for seedlings.
<b>Fencing</b>	Install temporary fencing	One - two weeks prior to start of works	ToC / Contractor	Install appropriate fencing and signage to inform public of planned works.
<b>Salvage native plants</b>	Collect seed or vegetative plant material from the areas that will be disturbed by restoration works.	1 x prior to restoration works starting	CCA / Contractor / ToC	Remove seed if ready and catalogue with CCA. Salvage vegetative material by digging with an excavator and placing in a suitable area. Alternatively trench long sections of the rhizome or use the material to propagate more plants in the nursery. Transplanting will work for <i>Spinifex</i> and <i>Ficinia nodosa</i> and is best done in winter. Success is variable particularly with Spinifex. <i>Melaleuca lanceolata</i> can be left <i>in situ</i> .
<b>Weed control</b>	Apply Herbicide – blanket and spot spray	2 x prior to restoration. Best done in June / July and September	ToC / Contractor	Apply blanket spray of Glyphosate to the weed infested areas containing no native vegetation. Spot spray around remnant Spinifex.
	Manual weeding	1 x prior to erosion control works	Contractor / ToC / CCA	Remove Coast Teatree and remove all material off site for disposal. Remove Sea Spinach and Pelargonium that grows amongst or covers Spinifex. Do this two weeks after first round of chemical weed application and prior to erosion control works. This is done to reduce damage to jute fabric.
<b>Site clean-up</b>	Remove all loose and dry plant debris to prepare site for matting	Prior to jute matting	Contractor / ToC	Use rakes and tarps to collect dry plant material and any loose seed such as that of Sea Spinach (if applicable) and dispose of site. Even out small holes on the dune for easier jute matt installation.
<b>Erosion control</b>	Install jute matt per manufacturer's specifications.		Contractor / ToC	Install fencing or signage to deter public from entering the site. Install wind fencing if the wind erosion becomes a problem. Plant densely along access pathway and along foreshore.
<b>Planting</b>	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organise meeting with schedule of planned works. Consider that steep areas of the site may be best planted by the contractor.
	Ensure water is available to water plants upon planting	April	ToC	Check water truck availability, water connection to the mains water supply, hoses, etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants and plant guards	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is visible. Cut 20 cm holes into jute matting and fold the cut corners under the stretched matting. Plant each seedling with one fertiliser tablet and create a well around the plant to facilitate watering later on. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Install plant guards to ¼ of planted stock mainly in the areas that could be easily accessed by the public and in very exposed areas.



# SITE INFORMATION – North Cottesloe - N3

## Changes in Vegetation since 2008



May 2008



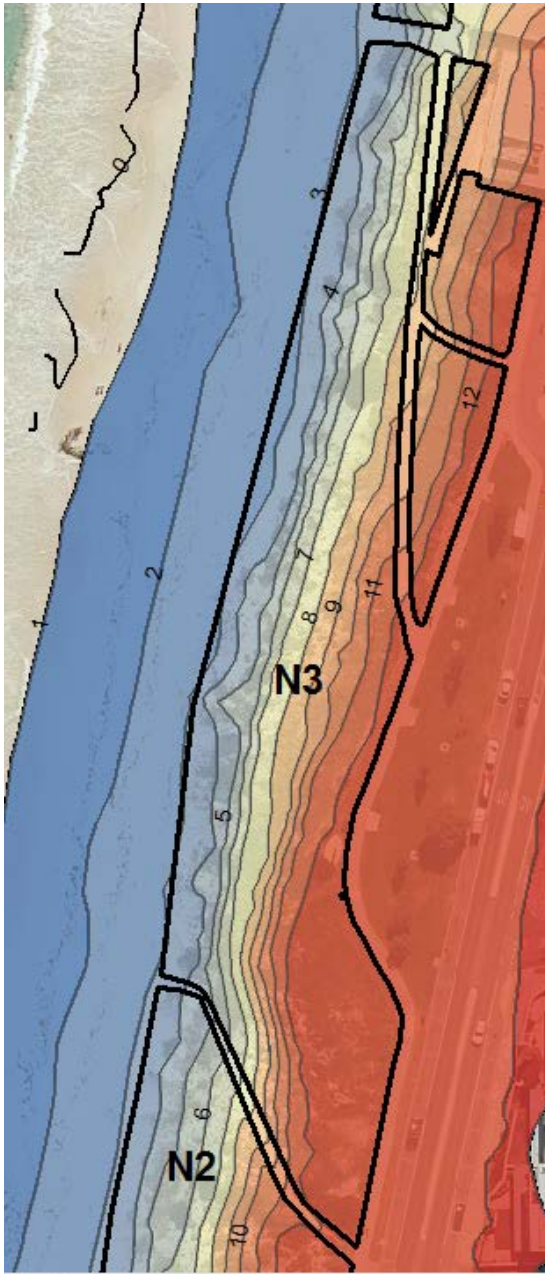
January 2014

- Increase in weed cover and density particularly density of Sea Spinach and Couch throughout
- Increase in woody weed cover from the existing trees
- Decrease in amenity value

### BASELINE (2015) VEGETATION CONDITION

Very Good	1%
Good	9%
Degraded	7%
Completely Degraded	82%





**Note:** Numbers inside polygons denote area in m<sup>2</sup>  
**Hatched area:** Coast Teatree

**NATIVE VEGETATION**

Patches of *Spinifex longifolius* along the foreshore and access path access path. Few very small patches also present slightly higher up slope near footpath. Coast Teatree present near restaurant.

**WEEDS**

- Dominant weeds** Couch and Sea Spinach for the majority of site with Couch and Kikuyu being dominant at the top of the slope
- Other weeds:** Pelargonium, Beach Evening Primrose, Dune Onion Weed, Marram Grass and Sea Wheat Grass.
- Woody Weeds:** Coast Teatree to the north of the site (see hatched area)





Distribution of high priority weeds for North Cottesloe - N3



**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

Informal access path opposite Ocean Beach Hotel - frequently used.

**PAST MANAGEMENT WORK – chronology 2008 – 2014****General maintenance:** Yes**Weed Control:** None**Planting:** None**CONDITION OF INFRASTRUCTURE****Pathway:** N3 – Moderate to poor Condition access (additional 'branch' pathway present joining onto N1 (see image below))**Signage:** Good**Fencing:** Pine bollards along access path in moderate condition**MAINTENANCE AND RESTORATION PRIORITIES****Restoration Priority:** High**Maintenance Priority:** Low**BASIC STATISTICS – North Cottesloe - N3**

Total AREA (m <sup>2</sup> )	6524
Completely degraded	4708
Degraded	416
Good	523
Very Good	69
Total vegetated area (m <sup>2</sup> )	5716
Bare area without infrastructure (e.g. paths or structures)	808
Woody weeds removal	272
Weed areas including woody weeds	4708
Area to stabilise by coir mat or jute matt	4350
Area to plant (m <sup>2</sup> )	5516
Number of plants required (at 3/m <sup>2</sup> )	16548
Supplementary Plants required (30%)	4964
Fencing (linear metres)	0
Sand trap fencing (linear metres)	0

**NOTE:** Suggested number of plants is considering dense planting of *Spinifex*. Of the total number of plants recommended 35% is for *Spinifex longifolius*. Thick band should be maintained to approximately 7m AHD (see topography map for indicative levels).



**AIMS OF REVEGETATION FOR 2015 - 2019**

- No Woody weeds by 2018
- No Marram or Sea Wheat Grass present (or less than 20 plants each) by 2018
- All planting completed by winter 2019
- <5% of the area covered by weeds by 2019

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- Upgrade path N3 by 2017
- Upgrade paved footpath to smooth surface footpath by 2019
- Complete necessary earthworks by 2017
- Install formal beach access opposite Ocean Beach Hotel by 2019

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Strengthen ecological links between north and south;
- Improve shoreline stability;
- Improve amenity value surrounding the Restaurant and the Surf club
- Involve business owners and Surf Club in restoration efforts – businesses can subsidise cost for plants and maintenance of garden beds adjacent to their business – Carbon Offsets are one way of doing this.



**LEFT: View of N3 dune facing south towards N2 access point showing elevated dune rise blocking view to the ocean and RIGHT: views looking north towards Surf Club.**

**IMPORTANT**

Restoration of this area can occur in stages concurrent with works in N1. Smaller sections of foreshore and upland can be restored by working from N4 pathway south towards Ocean Beach Hotel.

## IMPLEMENTATION PLAN - North Cottesloe - N3

### General Maintenance Prior and Post Restoration

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of litter appropriately. For the majority of site two inspections and litter collections can be made if the litter is not visible.
<b>Weed Control</b>	Manually remove weeds growing over Spinifex along pathways and foreshore	Every 2 months	ToC, CCA	Inspect. Organise a workbee if manual weeding would take a long time. Work with no more than 10 people and work in a line parallel to shore to examine the entire site.
	Hand weed garden beds	Every 2 months	ToC	Remove Sea Spinach that is growing in garden beds at the north of the site.
	Apply herbicide	2 x per year end of <b>April</b> / beginning of <b>May</b> and in <b>July</b>	ToC	Apply herbicide to Couch, Sea Spinach and Pelargonium to the north of the site (North of OBH). Also target Dune Onion Weed and Beach Evening Primrose.
	Eradicate Marram Grass	1 x per year in July	ToC / Contractor	Cut and remove Marram Grass and wipe / spray with Glyphosate.
	Eradicate Sea Wheat Grass	1 x per year in July	ToC / CCA/ Contractor	Cut and remove large plants and wipe with Glyphosate. Manually dig out any small plants.
<b>Fence repair</b>	Check and repair any damage to fencing	Weekly / during litter collection	ToC	Drive / walk by. Seek help from CCA volunteers for monitoring
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine number of supplementary plants required.
<b>Restoration</b>				
<b>Budget</b>	Determine if it is feasible to restore whole site in one year or if splitting site in the North and South section (from OBH) is a better option. Plan for additional Beach Access point near OBH.	1 year before funding application	ToC	Work with Town planners to determine best options for progress of works. In general north to south approach would work best due to the size / ease of restoration.
<b>Purchasing and Contractor Appointment</b>	Ensure all orders and contractor appointments have been made	6 months – 1 year prior to start o works	ToC	Appoint contractors for chemical weed control, erosion control works and planting if desired. Purchase materials required and order plants to maximise budget available. <b>Order plants</b> as soon as possible and order full amount or as many plants as possible. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species. Also order tree guards and fertiliser tablets (1 tablet per plant) and ¼ of guards for seedlings.
<b>Fencing</b>	Install temporary fencing as required	One - two weeks prior to start of works	ToC / Contractor	Install appropriate fencing and signage to inform public of planned works.
<b>Salvage native plants</b>	Collect seed or vegetative plant material from the areas that will be disturbed by restoration works.	1 x prior to restoration works starting	CCA / Contractor / ToC	Remove seed if ready and catalogue with CCA. Salvage vegetative material by digging with an excavator and placing in a suitable area. Alternatively trench long sections of the rhizome or use the material to propagate more plants in the nursery. Transplanting will work for <i>Spinifex</i> and <i>Ficinia nodosa</i> and is best done in winter. Success is variable particularly with Spinifex. <i>Melaleuca lanceolata</i> can be left <i>in situ</i> .
<b>Weed control</b>	Apply Herbicide – blanket and spot spray	2 x prior to restoration. Best done in June / July and September	ToC / Contractor	Apply blanket spray of Glyphosate to the weed infested areas containing no native vegetation. Spot spray around remnant Spinifex.
	Manual weeding	1 x prior to erosion control works	Contractor / ToC / CCA	Remove Coast Teatree and remove all material off site for disposal. Remove Sea Spinach and Pelargonium that grows amongst or covers Spinifex. Do this two weeks after first round of chemical weed application and prior to erosion control works. This is done to reduce damage to jute fabric.
<b>Site clean-up</b>	Remove all loose and dry plant debris to prepare site for matting	Prior to jute matting	Contractor / ToC	Use rakes and tarps to collect dry plant material and any loose seed such as that of Sea Spinach (if applicable) and dispose of site.
<b>Erosion control</b>	Install jute matt per manufacturer's specifications.		Contractor / ToC	Install fencing or signage to deter public from entering the site. Install wind fencing if the wind erosion becomes a problem. Plant densely along access pathway and along foreshore.
<b>Planting</b>	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organise meeting with schedule of planned works. Consider that steep areas of the site may be best planted by the contractor.
	Ensure water is available to water plants upon planting	April	ToC	Check water truck availability, water connection to the mains water supply, hoses etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants and plant guards	last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is visible. Cut 20 cm holes into jute matting and fold the cut corners under the stretched matting. Plant each seedling with one fertiliser tablet and create a well around the plant to facilitate watering later on. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Install plant guards to ¼ of planted stock mainly in the areas that could be easily accessed by the public and in very exposed areas.



# SITE INFORMATION – North Cottesloe - N4

## Changes in Vegetation since 2008



May 2008

→ Indicate changes in vegetation



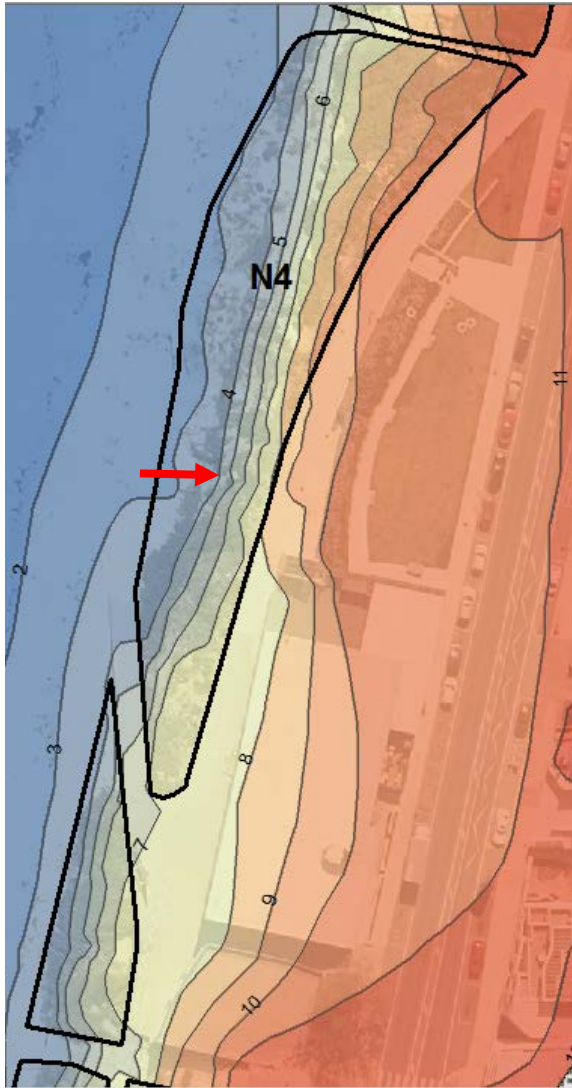
January 2014

→ Indicate points of erosion

- Decrease in woody weed cover and increase in Marram Grass and Sea Spinach density
- New plantings to the north of the site and in garden beds near surf club
- Increase in erosion surrounding the stormwater outlet
- Decrease in amenity value of natural areas
- Increase in built value of the club

### BASELINE (2015) VEGETATION CONDITION

Very Good	9%
Good	17%
Degraded	15%
Completely Degraded	59%



**Note:** Numbers inside polygons denote area in m<sup>2</sup>  
**Hatched area:** Coast Teatree

**NATIVE VEGETATION**

Patches of *Spinifex longifolius* along the foreshore and planted areas to the north.

**WEEDS**

- Dominant weeds**      Sea Spinach for the majority of site with Couch and Pelargonium to the north
- Other weeds:**        Marram Grass and Sea Wheat Grass. At the northern end of the site
- Woody Weeds:**      Coast Teatree to the north of the site (see hatched area)





Distribution of high priority weeds for North Cottesloe – N4

**PEST FAUNA**

Nil.

**EROSION AND SLOPE STABILITY ISSUES**

Medium level erosion around stormwater outlet pipe (red arrow)

**PAST MANAGEMENT WORK – chronology 2008 – 2014****General maintenance:** Yes**Weed Control:** Yes – woody weed and chemical - infrequent**Planting:** Yes northern section and Surf Club garden beds**CONDITION OF INFRASTRUCTURE****Pathway:** N4 – Good Condition**Signage:** Good**Fencing:** Needs repairs – re-tension wire.**MAINTENANCE AND RESTORATION PRIORITIES****Restoration Priority:** High**Maintenance Priority:** Medium - High**BASIC STATISTICS – North Cottesloe - N4**

<b>BASIC STATISTICS – North Cottesloe - N4</b>	
<b>Total AREA (m<sup>2</sup>)</b>	<b>2429</b>
<b>Completely degraded</b>	<b>1399</b>
<b>Degraded</b>	<b>352</b>
<b>Good</b>	<b>394</b>
<b>Very Good</b>	<b>212</b>
<b>Total vegetated area (m2)</b>	<b>2357</b>
<b>Bare area without infrastructure (e.g. paths or structures)</b>	<b>72</b>
<b>Woody weeds removal</b>	<b>257</b>
<b>Weed areas including woody weeds</b>	<b>1399</b>
<b>Area to stabilise by coir mat or jute matt</b>	<b>1100</b>
<b>Area to plant (m<sup>2</sup>)</b>	<b>1471</b>
<b>Number of plants required (at 3/m<sup>2</sup>)</b>	<b>4413</b>
<b>Supplementary Plants required (30%)</b>	<b>1324</b>
<b>Fencing (linear metres)</b>	<b>96</b>
<b>Sand trap fencing (linear metres)</b>	<b>0</b>

**NOTE:** Suggested number of plants is considering dense planting of *Spinifex*. Of the total number of plants it is recommended that 60% is for *Spinifex longifolius* due to low lying nature of the site. Thick band should be maintained to approximately 7m AHD (see topography map for indicative levels + majority of site)



**AIMS OF REVEGETATION FOR 2015 - 2019**

- No Woody weeds by 2017
- No Marram or Sea Wheat Grass present (or less than 20 plants each) by 2019
- All planting completed by winter 2017
- <5% of the area covered by weeds by 2019

**AIMS FOR CAPITAL WORKS - INFRASTRUCTURE**

- Re-design stormwater outlet so the outflows do not erode shoreline by 2019
- Install new bollards / fence at the top of the dune

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Strengthen ecological links between north and south;
- Improve shoreline stability;
- Improve amenity value surrounding the Surf club
- Involve Surf Club in restoration efforts including weeding.



View of new garden beds and area near access path with large infestation of Sea Spinac



Marram Grass and Sea Wheat at the foreshore

**IMPORTANT**

Restoration of this area can occur in stages. Jute matting is suggested but mulching can be used also although this measure does not have the same weed suppressant qualities.

As the Club is a high use area Maintenance activities need to occur at times when Club is quiet.

## IMPLEMENTATION PLAN - North Cottesloe - N4

### General Maintenance Prior and Post Restoration

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of appropriately. Surf Club can assist.
<b>Weed Control</b>	Manually remove weeds growing over native plants along foreshore	Every 2 months	ToC, CCA	Inspect. Organise a work bee
	Hand weed garden beds	Every 2 months	ToC/ Surf Club	Remove Sea Spinach that is growing in garden beds at the north of the site. Organise work bee with Surf Club members
	Apply herbicide	2 x per year end of <b>April</b> / beginning of <b>May</b> and in <b>July</b>	ToC	Apply herbicide to Couch, Sea Spinach and Pelargonium to the north of the site (North of OBH). Also target Dune Onion Weed.
	Eradicate Marram Grass	1 x per year in July	ToC / Contractor	Cut and remove Marram Grass and wipe / spray with Glyphosate.
	Eradicate Sea Wheat Grass	1 x per year in July	ToC / CCA/ Contractor	Cut and remove large plants and wipe with Glyphosate. Manually dig out any small plants.
<b>Fence repair</b>	Re-tighten fencing wire and check posts	Immediately , then follow up via regular inspections	ToC/ Contractor	Organise repair. Monitor with help of Surf Club and CCA volunteers
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine number of supplementary plants required.
<b>Restoration</b>				
<b>Purchasing and Contractor Appointment</b>	Ensure all orders and contractor appointments have been made	6 months – 1 year prior to start o works	ToC	Appoint contractors for chemical weed control, erosion control works and planting if desired. Purchase materials required and order plants to maximise budget available. <b>Order plants</b> as soon as possible and order full amount or as many plants as possible. Use plant list and contact preferred nursery (e.g. APACE) to obtain plant quantity as specified. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species. Also order tree guards and fertiliser tablets (1 tablet per plant) and ¼ of guards for seedlings.
<b>Fencing</b>	Install temporary fencing as required	One - two weeks prior to start of works	ToC / Contractor	Install appropriate fencing and signage to inform public of planned works.
<b>Salvage native plants</b>	Collect seed or vegetative plant material from the areas that will be disturbed by restoration works.	1 x prior to restoration works starting	CCA / Contractor / ToC	Remove seed if ready and catalogue with CCA. Salvage vegetative material by digging with an excavator and placing in a suitable area. Alternatively trench long sections of the rhizome or use the material to propagate more plants in the nursery. Transplanting will work for <i>Spinifex</i> and <i>Lepidosperma gladiatum</i> and is best done in winter. Success is variable particularly with <i>Spinifex</i> . Remaining <i>Melaleuca lanceolata</i> can be left <i>in situ</i> .
<b>Weed control</b>	Apply Herbicide – blanket and spot spray	2 x prior to restoration. Best done in June / July and September	ToC / Contractor	Apply blanket spray of Glyphosate to the weed infested areas containing no native vegetation. Spot spray around remnant <i>Spinifex</i> .
	Manual weeding	1 x prior to erosion control works	Contractor / ToC / CCA	Remove Coast Teatree and remove all material off site for disposal. Cut and remove stumps of already cut trees to increase amenity value. Remove Sea Spinach and Pelargonium that grow amongst or covers <i>Spinifex</i> .
<b>Site clean-up</b>	Remove all loose and dry plant debris to prepare site for matting	Prior to jute matting	Contractor / ToC	Use rakes and tarps to collect dry plant material and any loose seed such as that of Sea Spinach (if applicable) and dispose of site. Even out small holes on the dune for easier jute matt installation.
<b>Erosion control</b>	Install jute matt per manufacturer's specifications.		Contractor / ToC	Install fencing or signage to deter public from entering the site. Install wind fencing if the wind erosion becomes a problem. Plant densely along access pathway and along the foreshore. <b>DO not install jute matt in already mulched areas.</b>
<b>Planting</b>	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organise meeting with schedule of planned works. Consider that steep areas of the site may be best planted by the contractor. Consider Surf Club member involvement.
	Ensure water is available to water plants upon planting	April	ToC	Check adequate length hoses are available and use Surf Club, Water supply. Check availability of these on weekends when CCA volunteers are likely to work.
	Install plants and plant guards	last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is visible. Cut 20 cm holes into jute matting and fold the cut corners under the stretched matting. Plant each seedling with one fertiliser tablet and create a well around the plant to facilitate watering later on. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Install plant guards to ¼ of planted stock mainly in the areas that could be easily accessed by public and in very exposed areas. Plant <i>Lepidosperma gladiatum</i> around surf ski and board wash area.



# SITE INFORMATION – North Street – N12

## Changes in Vegetation since 2008



May 2008



January 2014

➡ Indicate changes in vegetation

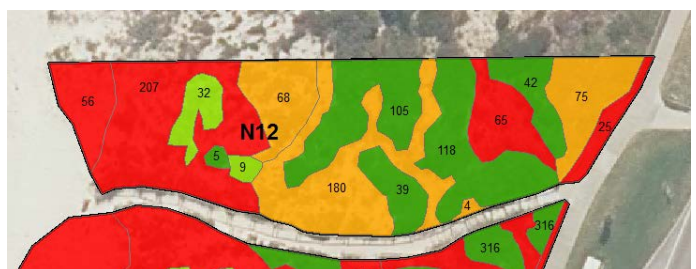
- Increase in *Acacia rostellifera* cover
- Increase in \**Pelargonium capitatum* cover
- Increase in Sea Wheatgrass and Marram Grass Cover on the foredune together with Sea Spinach

### BASELINE (2015) VEGETATION CONDITION

Very Good	30%
Good	4%
Degraded	32%
Completely Degraded	34%

Small area links to primary dunes of Bush Forever Site 315 which is an integral part of the coastal regional linkage.

### Vegetation Condition



**Note:** Numbers inside polygons denote area in m<sup>2</sup>

**NATIVE VEGETATION**

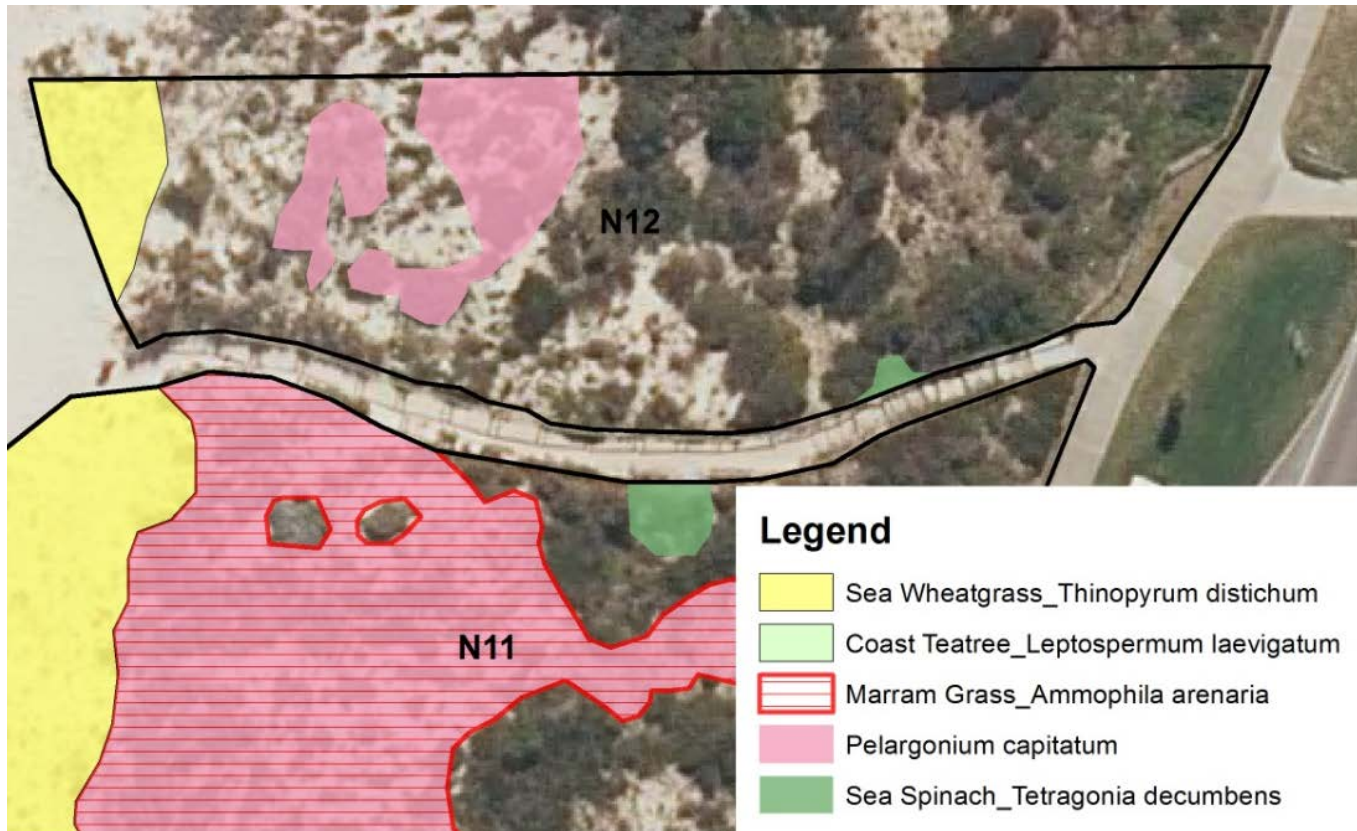
*Acacia rostellifera* thicket in the upper slope and the dune swale with *Scaevola crassifolia* and *Olearia axillaris* on lower slopes. *Ficinia nodosa* also present and lower end of access path.

**WEEDS**

**Dominant weeds** Couch on upper slope and *Pelargonium* and Marram grass on lower slope

**Other weeds:** Dune Onion Weed, Sea Spurge and Sea Wheatgrass.

**Woody Weeds:** Nil.



**Distribution of high priority weeds at North Street – N12**

**PEST FAUNA**

Fresh rabbit scats and diggings in the swale.

**EROSION AND SLOPE STABILITY ISSUES**

Steep top of slope that is covered sparsely with Couch. Very poor establishment of plants planted last season or season before.

**PAST MANAGEMENT WORK – chronology 2008 – 2014**

**General maintenance:** Yes

**Weed Control:** None

**Planting:** None

**CONDITION OF INFRASTRUCTURE**

**Pathway:** N12 – Moderate to poor condition access. One of the chain linked bollards on the pathway is detached and need maintenance.

**Signage:** Good

**Fencing:** Pine bollards along access path in good condition





## MAINTENANCE AND RESTORATION PRIORITIES

Restoration Priority: High

Maintenance Priority: Medium to Low

### BASIC STATISTICS - North Street – N12

Total AREA (m <sup>2</sup> )	1031
Completely degraded	353
Degraded	327
Good	41
Very Good	309
Total vegetated area (m2)	1030
Bare area without infrastructure (e.g. paths or structures)	1
Woody weeds removal	0
Weed areas including woody weeds	292
Area to stabilise by coir mat or jute matt	65
Area to plant (m <sup>2</sup> )	293
Number of plants required (at 3/m <sup>2</sup> )	879
Supplementary Plants required (30%)	264

NOTE: Suggested number of plants is considering denser planting of *Spinifex* on the lower part of the dune.

### AIMS OF REVEGETATION FOR 2015 - 2019

- <1% Marram and Sea Wheatgrass present by 2019
- All planting completed by winter 2018
- <5% of the area covered by weeds by 2019

### AIMS FOR CAPITAL WORKS - INFRASTRUCTURE

- Upgrade path by 2018
- Complete necessary earthworks by 2018

**OPPORTUNITIES FOR HABITAT EXTENSION / IMPROVEMENT**

- Implement restoration works in this section to strengthen links between Bush Forever Site 315 and the Town's natural areas to the south.
- Opportunity to seek funding with the City of Nedlands and work collaboratively on the dune restoration project.



View of N12 dune looking south west (top) showing *Pelargonium*, Marram Grass and native shrubs on lower slope and a view of sparsely planted upper slope of the same dune (bottom) looking north east



## IMPLEMENTATION PLAN - North Street – N12

### General Maintenance Prior and Post Restoration

Task	Action	Timing / When	Responsibility / Who	Where/ how
<b>Refuse and litter collection</b>	Inspect area for refuse and litter and collect	Daily / Weekly /biannually	ToC	Inspect daily along pathways and collect / dispose of appropriately. For the majority of site two inspections and litter collections can be made if the litter is not visible.
<b>Weed Control</b>	Manually remove weeds growing over Spinifex along pathways and foreshore	Every 2 months	ToC, CCA	Inspect. Organise a workbee if manual weeding would take a long time. Work with no more than 10 people and work in a line parallel to shore to examine the entire site.
	Apply herbicide	2 x per year end of <b>April</b> / beginning of <b>May</b> and in <b>July</b>	ToC	Apply herbicide to Pelargonium.
	Eradicate Marram Grass	1 x per year in July	ToC / Contractor	Cut and remove Marram Grass and wipe / spray with Glyphosate.
	Eradicate Sea Wheatgrass	1 x per year in July	ToC / CCA/ Contractor	Cut and remove large plants and wipe with Glyphosate. Manually dig out any small plants.
<b>Fence repair</b>	Monitor and repair any damage to fencing	Weekly / during regular refuse collection	ToC	Drive / walk by. Seek help from CCA volunteers for monitoring
<b>Monitoring</b>	Monitor site for weed invasion and plant establishment success / watering requirements and guard removal	Monthly throughout the year but mainly during May - March for plant watering requirements	CCA, ToC	Visually inspect areas - CCA can assist with this and map note areas of concern to follow up during scheduled weed control.
<b>Supplementary planting</b>	Monitor site for plant establishment success in March.	March	ToC / CCA	Visually inspect site, collect plant guards and bamboo stakes. Based on the level of plant losses and native plant coverage determine number of supplementary plants required.

### Restoration

<b>Purchasing and Contractor Appointment</b>	Ensure all orders and contractor appointments have been made	6 months – 1 year prior to start o works	ToC	Appoint contractors for chemical weed control, erosion control works and planting if desired. Purchase materials required and order plants to maximise budget available. <b>Order plants</b> as soon as possible and order full amount or as many plants as possible. Use plant list and contact preferred nursery to obtain plant quantity as specified. It is always preferable to use local provenance stock but other provenance can be used for the foreshore area. Consult with CCA with regards to seed availability and sourcing correct species. Also order tree guards and fertiliser tablets (1 tablet per plant) and ¼ of guards for seedlings.
<b>Fencing</b>	Install temporary fencing	One - two weeks prior to the start of works	ToC / Contractor	Install appropriate fencing and signage to inform public of planned works.
<b>Weed control</b>	Apply Herbicide – blanket and spot spray	2 x prior to restoration. Best done in June / July and September	ToC / Contractor	Apply blanket spray of Glyphosate to the weed infested areas containing no native vegetation. Spot spray around remnant Spinifex.
<b>Site clean-up</b>	Remove all loose and dry plant debris to prepare site for matting	Prior to jute matting	Contractor / ToC	Use rakes and tarps to collect dry plant material and any loose seed such as that of Sea Spinach (if applicable) and dispose of site. Even out small holes on the dune for easier jute matt installation.
<b>Erosion control</b>	Install jute matt per manufacturer's specifications.	March - April	Contractor / ToC	Use starch and not metal pins.
<b>Planting</b>	Schedule planting days in collaboration with CCA	March	ToC, CCA	Organise meeting with schedule of planned works. Consider that steep areas of the site may be best planted by the contractor.
	Ensure water is available to water plants upon planting	April	ToC	Check water truck availability, water connection to the mains water supply, hoses, etc. Check the availability of these on weekends when CCA volunteers are likely to work.
	Install plants and plant guards	Last week of May - end of June	CCA, ToC	Ensure plants are spread to desired / correct locations with consideration for amenity and viewing vistas. Ensure diversity is visible. Cut 20 cm holes into jute matting and fold the cut corners under the stretched matting. Plant each seedling with one fertiliser tablet and create a well around the plant to facilitate watering later on. Water in plants after planting unless a heavy rainfall is occurring on the day / or one day prior / post planting where soils are sufficiently moist. Install plant guards to ¼ of planted stock mainly in the areas that could be easily accessed by the public and in very exposed areas.

**Appendix 3 EPBC Protected Matters Search Tool Report**





# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

LGA TOWN OF COTTESLOE, WA

Report created: 01/06/15 18:19:35

[Summary](#)

[Details](#)

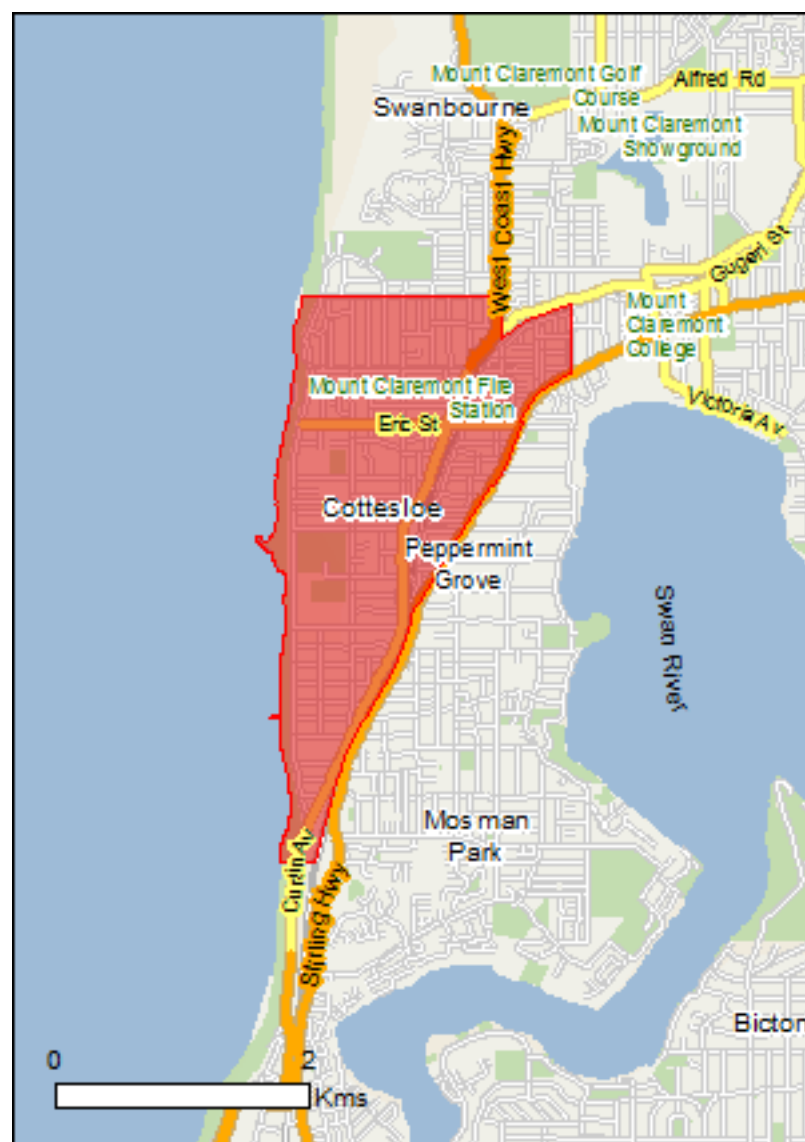
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

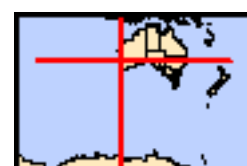
[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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# Summary

## Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Significance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Threatened Ecological Communities:</a>	None
<a href="#">Threatened Species:</a>	37
<a href="#">Migratory Species:</a>	37

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

<a href="#">Commonwealth Lands:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	58
<a href="#">Whales and Other Cetaceans:</a>	13
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	41
<a href="#">Nationally Important Wetlands:</a>	None



# Details

## Matters of National Environmental Significance

Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>BIRDS</b>		
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diomedea epomophora epomophora</a> Southern Royal Albatross [25996]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea epomophora sanfordi</a> Northern Royal Albatross [82331]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans amsterdamensis</a> Amsterdam Albatross [82330]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea exulans exulans</a> Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea exulans (sensu lato)</a> Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Thalassarche cauta cauta</a> Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche cauta steadi</a> White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris impavida</a> Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area

## MAMMALS

<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion [22]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir [25911]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Setonix brachyurus</a> Quokka [229]	Vulnerable	Species or species habitat may occur within area

## PLANTS

<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Centrolepis caespitosa</a> [6393]	Endangered	Species or species habitat likely to occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Drakaea elastica</a> Glossy-leafed Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area

## REPTILES

<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
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Name	Status	Type of Presence
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area

## SHARKS

<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

## Migratory Species

[ [Resource Information](#) ]

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered*	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
<a href="#">Diomedea epomophora (sensu stricto)</a> Southern Royal Albatross [1072]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans (sensu lato)</a> Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Foraging, feeding or related behaviour likely

Name	Threatened	Type of Presence to occur within area
<a href="#">Thalassarche cauta (sensu stricto)</a> Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<b>Migratory Marine Species</b>		
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Carcharodon carcharias</a> Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

**Migratory Terrestrial Species**



Name	Threatened	Type of Presence
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Pandion cristatus</a> Eastern Osprey [82411]		Breeding known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

## Other Matters Protected by the EPBC Act

### Commonwealth Lands [\[ Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

### Listed Marine Species [\[ Resource Information \]](#)

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered*	Species or species habitat may occur within area
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
<a href="#">Diomedea epomophora (sensu stricto)</a> Southern Royal Albatross [1072]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans (sensu lato)</a> Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Larus pacificus</a> Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Puffinus assimilis</a> Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche cauta (sensu stricto)</a> Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thinornis rubricollis</a> Hooded Plover [59510]		Species or species habitat likely to occur within area
<b>Fish</b>		
<a href="#">Acentronura australe</a> Southern Pygmy Pipehorse [66185]		Species or species



Name	Threatened	Type of Presence
<a href="#">Campichthys galei</a> Gale's Pipefish [66191]		habitat may occur within area  Species or species habitat may occur within area
<a href="#">Heraldia nocturna</a> Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus breviceps</a> Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
<a href="#">Hippocampus subelongatus</a> West Australian Seahorse [66722]		Species or species habitat may occur within area
<a href="#">Histiogamphelus cristatus</a> Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
<a href="#">Lissocampus caudalis</a> Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
<a href="#">Lissocampus fatiloquus</a> Prophet's Pipefish [66250]		Species or species habitat may occur within area
<a href="#">Lissocampus runa</a> Javelin Pipefish [66251]		Species or species habitat may occur within area
<a href="#">Maroubra perserrata</a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area
<a href="#">Mitotichthys meraculus</a> Western Crested Pipefish [66259]		Species or species habitat may occur within area
<a href="#">Nannocampus subosseus</a> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
<a href="#">Phycodurus eques</a> Leafy Seadragon [66267]		Species or species habitat may occur within area
<a href="#">Phyllopteryx taeniolatus</a> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
<a href="#">Pugnaso curtirostris</a> Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Stigmatopora argus</a> Spotted Pipefish, Gulf Pipefish [66276]		Species or species habitat may occur within area
<a href="#">Stigmatopora nigra</a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Urocampus carinirostris</a> Hairy Pipefish [66282]		Species or species habitat may occur within area
<a href="#">Vanacampus margaritifer</a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
<a href="#">Vanacampus phillipi</a> Port Phillip Pipefish [66284]		Species or species habitat may occur within area
<a href="#">Vanacampus poecilolaemus</a> Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Arctocephalus forsteri</a> New Zealand Fur-seal [20]		Species or species habitat may occur within area
<a href="#">Neophoca cinerea</a> Australian Sea-lion [22]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<b>Reptiles</b>		
<a href="#">Aipysurus pooleorum</a> Shark Bay Seasnake [66061]		Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
<b>Whales and other Cetaceans</b>		<b>[ Resource Information ]</b>
Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area



Name	Status	Type of Presence
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

### Invasive Species [\[ Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit,

Name	Status	Type of Presence
<b>Birds</b>		
<i>Acridotheres tristis</i> Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
<i>Anas platyrhynchos</i> Mallard [974]		Species or species habitat likely to occur within area
<i>Carduelis carduelis</i> European Goldfinch [403]		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow [405]		Species or species habitat likely to occur within area
<i>Passer montanus</i> Eurasian Tree Sparrow [406]		Species or species

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		habitat likely to occur within area  Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species



Name	Status	Type of Presence
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		habitat may occur within area  Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area  Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
<b>Reptiles</b>		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat likely to occur within area

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.



# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Department of Environment, Climate Change and Water, New South Wales](#)
- [-Department of Sustainability and Environment, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

[Please feel free to provide feedback via the Contact Us page.](#)

**Appendix 4 CCA NAMP Audit and Update Proposal**



TOWN OF COTTESLOE NATURAL AREAS  
MANAGEMENT PLAN 2008-2013:  
STRATEGY AUDIT AND UPDATE PROPOSAL

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## 1.0 NAMP STRATEGY AUDIT

### 1.1 BACKGROUND

The Natural Areas Management Plan 2008-2013 (NAMP) identifies and characterises areas within the Town of Cottesloe that are of environmental significance and outlines a strategic approach to their management and enhancement. The document is designed to provide strategic guidance for both the Town's works staff and community volunteers working in natural areas to ensure that these areas are managed in an effective and efficient manner. In addition, the NAMP provides guidance for resource allocation/annual budgets and is an essential requirement for obtaining a range of additional funding such as state and federal government grants.

The intended 5 year program timeframe of the current document has now expired and requires updating to ensure the continued effective management of natural areas and to improve on the coordination, resourcing and implementation of existing management practices.

### 1.2 PURPOSE OF THE AUDIT

The purpose of the audit has been to determine what management strategies and actions have been implemented, as outlined in the NAMP, during the period between 2008 and 2013 and their effectiveness in relation to the objectives outlined in the NAMP. This has been undertaken to rationalise a review and update of the document, which will provide management guidance and facilitate the effective allocation of resources for another 5 year period.

### 1.3 AIMS, OBJECTIVES AND RECOMMENDATIONS OF THE EXISTING NAMP

The overall guiding aim of the NAMP 2008-2013 was to identify areas in the Town of Cottesloe that are to be managed as natural areas and to provide guidelines and priorities for their management with a view to protecting, preserving and enhancing local biodiversity.

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## SUMMARY OF KEY RECOMMENDATIONS - NAMP 2008-2013:

1. The Town of Cottesloe ensures the social, environmental and management values of the natural areas are recognised and addressed and implemented in the Town's policies, planning and work procedures.
2. The Town of Cottesloe enacts policies to protect the defined existing natural areas and ensure they are not developed or otherwise diminished.
3. The Town of Cottesloe adopts the Management Framework outlined in this report as aid to prioritising and planning work and to assist in operational activities.
4. The Town of Cottesloe assigns highest priority to the following existing natural areas (ENAs):
  - a. Mudurup
  - b. Cottesloe Native Gardens
  - c. Vlamingh Parklands
  - d. Grant Marine Park.

5. The Town of Cottesloe assigns highest priority to develop the following potential natural areas (PNAs):
  - a. Land adjacent to the railway line
  - b. John Black Dune Park.
6. The Town of Cottesloe recognises the opportunity to naturalise verges, median strips and other grassed areas.
7. The Town of Cottesloe recognises that the protection and rehabilitation of ENAs is of higher importance than developing PNAs and that any work towards PNAs should only be conducted when it does not compromise efforts towards preserving ENAs.
8. The Town of Cottesloe adopts the implementation of works outlined in the report in regards to weed management, revegetation erosion, pest management and infrastructure.
9. The Town of Cottesloe investigates means to gain access to Bushcare experience, including the possibility of sharing the funding of a Bushcare Officer with other members of the Western Suburbs Regional Organisation of Councils (WESROC).

*Additional Notes:*

*Delegating responsibilities to particular parties for implementation of this plan was excluded on the basis that this was best determined by negotiation between stakeholders after endorsement by the Town of Cottesloe.*

*The objectives for the NAMP were to develop strategic recommendations, but did not include detailed implementation plans for works, nor was infrastructure (such as signs, paths and fences) a particular focus of the project.*

## 1.4 IMPLEMENTATION 2008-2013

### OVERVIEW OF IMPLEMENTATION 2008 - 2013

The following provides a general overview of how the key recommendations from the NAMP have been implemented:

- Existing natural areas have been identified and spatially recorded. Policies recognising the Town's natural areas have been prepared and implemented at varying levels;
- The NAMP has been used to prioritise and allocate resources as part of the Town's annual budget process and operational activities. It has also been used to support numerous successful grant applications;
- Existing natural area prioritisation has been followed as per the NAMP with works focused in the areas of highest priority;
- John Black Dune Park (PNA) is in the process (concept phase) of being restored to a representative natural area including passive recreational and interpretive integration. The railway corridor (PNA) has not been investigated further and has been given a low priority;
- Verges and median strips have changed little and, due to public contention and their limited ecological value, have been considered a lower priority;

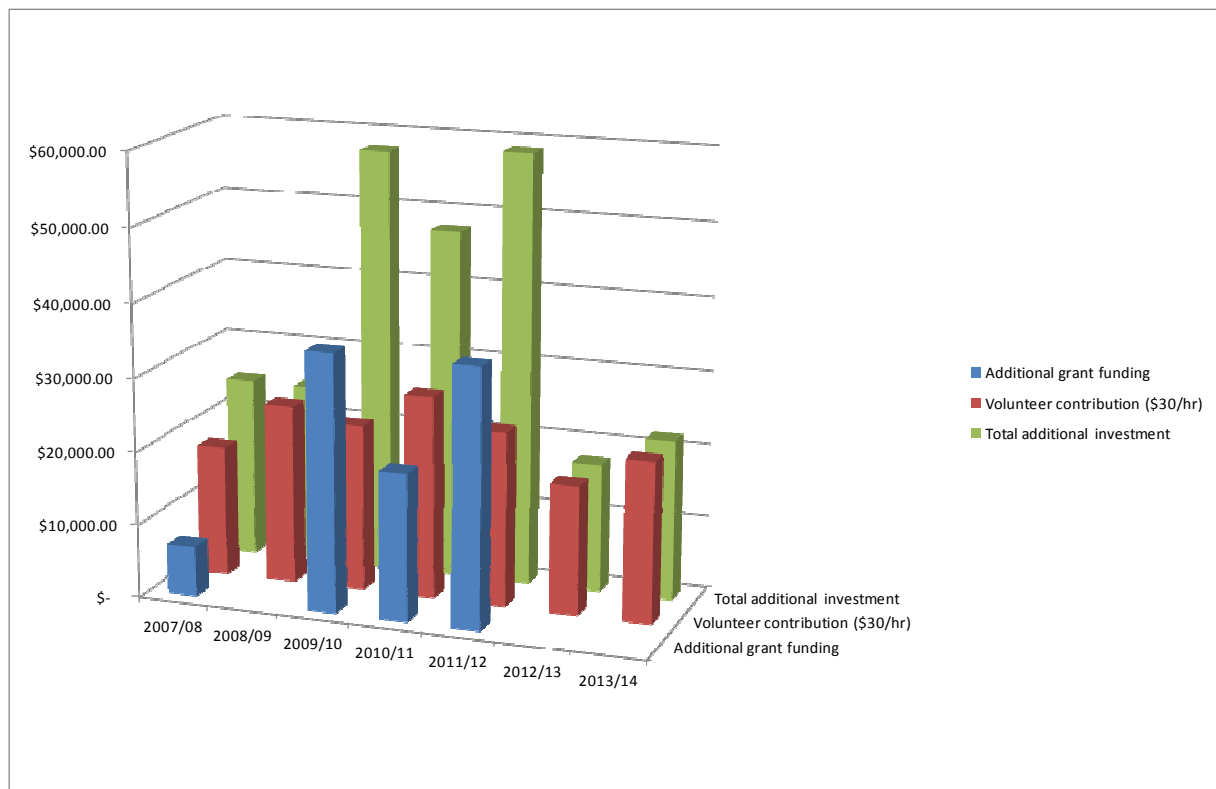


- ENAs have received significantly more resources than PNA as recommended;
- General strategies recommended in the NAMP regarding natural area management have been incorporated into works planning by both Cottesloe Coastcare and the Town’s works crew; and
- The Bushcare Officer position was implemented but was not sustained due to various reasons.

## INVESTMENT IN NATURAL AREAS 2008-2013

Cottesloe Coastcare liaises with Town of Cottesloe regarding the natural areas budget annually (most years the budget is approximately \$15,000). An action plan is created for Town of Cottesloe staff and CCA volunteers, guided by the NAMP 2008-13.

In addition to the annual budget allocation from the Town of Cottesloe, financial investment from external sources for specific projects and volunteer labour contributes significantly to natural areas. The average proportion of investment from these additional sources over the period in question is approximately \$2.40 for every \$1 invested by the Town of Cottesloe.



**Additional investment for natural areas 2007/08 to 2013/14**

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### **TOTAL EXTERNAL FINANCIAL CONTRIBUTION: \$96,850**

Cottesloe Coastcare Association has leveraged significant funds to contribute to natural area management. The total value of external funding received by CCA for Cottesloe's natural areas (since 2008) is \$96,850. CCA's projects have been guided by the NAMP and this external funding is reliant on the Town of Cottesloe maintaining an up-to-date natural area management document that is endorsed by council.

- 2007/8 – CCA received an Australian Government Envirofund grant of \$6,850 for restoration work at Bryan Way foredune.
- 2009/10 - Synergy and Landcare sponsored a CCA and Town of Cottesloe natural areas restoration project at Mudurup Rocks. A grant of \$35,000 was awarded for plants, fencing and building a retaining wall.
- 2010/11 - CCA and Town of Cottesloe received an Australian Government 'Caring for Our Country' (CFoC) grant of \$20,000 for the Vlamingh area (weedy tea tree removal, re-planting and fencing)
- 2011/12 - CCA and Town of Cottesloe undertook a Coastwest funded restoration project at Napier St dunes. \$35,000 funding was received – 2 ramps were built plus revegetation.

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### **CONTRIBUTION OF VOLUNTEER LABOUR: 5,185 HOURS (\$155,550)**

Hours worked on the foreshore by CCA volunteers (including school and University students and corporate volunteers). These totals only reflect on-ground activities and do not include hours provided for coordination, meetings etc. performed by volunteers. Dollar figures are assigned to volunteer hours at \$30/hr, which is used to represent an indication of volunteer contributions consistent with grant applications (Coastwest and CFoC).

- 2008 – CCA contributed 591 hours of work. - \$17,730.
- 2009 – 815 hours of voluntary work on the dunes – \$24,450
- 2010 – 756 hours of voluntary work – \$22,680
- 2011 – 920 voluntary hours – \$27,600
- 2012 - CCA volunteers worked 790 hours - \$23,700
- 2013 - CCA volunteers worked 586 hours - \$17,580
- 2014 – Hours worked until end July - 727 hours - \$21,810



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## KEY ACHIEVEMENTS

The following identifies the key areas where works have been undertaken and highlights the achievements made during the 2008 -2013 period.

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### GRANT MARINE PARK

**Weed control** – CCA volunteers regularly run hand weeding sessions, particularly in Spring (before seed sets) and in autumn (at sites to be planted in winter). A herbicide contractor (Biara Environmental) has been employed each spring to target priority bulbous weeds – Black Flag (*Ferraria crispa*), Red Soldiers (*Lachenalia bulbifera*) and couch grass (*Cynodon dactylon*).

**Pest control:** Rabbit (bait stations with Pindone oats) used each summer, with good results.

**Revegetation** – each year (since 2008) approximately 500 local native seedlings have been planted by CCA volunteers (grown from local provenance seed).

- 2009 – An area of adjacent lawn S/W of the natural area was converted to local native species. CCA volunteers planted 750 seedlings followed by regular weeding sessions. Price Waterhouse Coopers and Rio Tinto staff assisted.
- Also in 2009 – a weed infested verge on the north side of the park was weeded and planted by CCA with 750 seedlings. Scotch College students assisted at this site.

There is on-going disturbance at the site, primarily from children playing in the sand dunes.



Grant Marine Park images 2007 (inset) and 2010



**Grant Marine Park Verge 2009 (inset) and 2011**



**Eastern side of Grant Marine Park 2009 (inset) and 2012**



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## BRYAN WAY FOREDUNE

CCA had a revegetation project at the site in 2007. During 2008-9 hand weeding and infill planting work was carried out by CCA. Approximately 500 extra seedlings planted by CCA in 2010.



2007 removing Victorian Tea Tree



2010 after follow up planting

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## NAPIER STREET FOREDUNE (PETERS POOL AREA)

CCA and Town of Cottesloe undertook a Coastwest restoration project in 2011/12 (\$35,000 funding).

**Infrastructure** – Two beach access ramps built and beach fencing erected.

**Weeds and Planting** – Contractor weed spraying and removal of Victorian tea tree (*Leptospermum laevigatum*). 3000 local provenance dune seedlings planted by CCA in 2012; 1000 seedlings planted by volunteers in 2013 and 1000 more seedlings in 2014. CCA regularly have hand weeding sessions - particularly in spring (before seed sets) and in autumn (at sites to be planted in winter). Price Waterhouse Coopers and Rio Tinto staff assisted. (Blow out area around storm water drain is not improved, despite Council efforts).



Photo (L) sea spinach and tea tree 2011. Photo (R) new ramp on north side with local plant species establishing - 2012



**Photo (L) new fence. Photo (R) volunteers planting at Napier St foredune 2011**

### MUDURUP ROCKS

Synergy and Landcare sponsored a CCA and Town of Cottesloe project at Mudurup Rocks in 2009-10. \$35,000 was spent on a limestone retaining wall and pine log fencing; 4000 local native plants were funded as was herbicide work and rabbit control. CCA volunteers collected and cleaned all the seed required, planted and weeded the site and carried out further planting in 2011 - of 1000 more plants. CCA continues weeding sessions and general maintenance at the site.

Victorian tea tree and other woody weeds were removed (pre-planting) plus weed spraying of carnation weed, black flag, rose pelargonium and couch grass. Black flag is sprayed each spring. Rabbit baiting continues each summer, as required.

Staff from Synergy and from Coca Cola assisted with planting and weeding. Quintilian and Hale School students also joined in planting sessions.



**Mudurup Rocks 2009**



**Mudurup Rocks same site 2012**





**Mudurup rocks verge - new fence and weeds sprayed – (R) same site 2012**



**(L) – Quintilian students planting. (R) limestone retaining wall**

## DUTCH INN

CCA commenced low scale restoration work here in 2008. Town of Cottesloe removed some Victorian teatree and couch grass has been sprayed several times. CCA volunteers planted approximately 1000 seedlings(2008) and had summer watering and weeding sessions at the site. Some infill planting was done by CCA in 2010 and 2013,(approx 300 plants each time).

In 2012 Town of Cottesloe built a weed barrier between the playground lawns and the top of the narrow (weed infested) fore dune on the north side of Dutch Inn groyne. Woody weeds were removed in early 2014. Couch, pelargonium and sea spinach were sprayed in Oct 2013 and again in May 2014. CCA volunteers planted 600 plants on this dune in June 2014.



**(L) planting south of Dutch Inn groyne 2008 (R) planting north of Dutch Inn groyne 2014**

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## SYDNEY STREET RAMP

Early in 2014 Town of Cottesloe removed some Victorian tea trees near the ramp. CCA volunteers planted 250 local dune plants at the site in June 2014.

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## VLAMINGH AREA

During 2010 – 2011, CCA and Town of Cottesloe received an Australian Government 'Caring for our Country' grant of \$20,000 to remove Victorian tea tree and re-introduce local plants to an area on the north side of Vlamingh memorial. (Funds were also to be used to build a timber platform for hang gliding, to ease erosion issues but Town of Cottesloe decided not to proceed with this aspect of the project and further dune fencing was done instead).

Contractors removed and mulched Victorian tea trees. In winter 2010 CCA planted 3,500 seedlings at the site assisted by Hale School and University of WA guild. Volunteers watered seedlings by hand in spring and early summer and have regularly hand weeded the area.



**Photos of Vlamingh site - before (2010) and after (2013).**

In 2014 another small area of Victorian tea tree was removed nearby and CCA volunteers planted 250 plants in its place.

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## COTTESLOE NATIVE GARDEN

Each year since 2008 CCA volunteers have worked regularly at Cottesloe Native Garden.

**CCA (And Town of Cottesloe) use the guidelines in Cottesloe's NAMP to manage work at Cottesloe Native Garden, as in CCA's other project areas.**

**Weed control** – Town of Cottesloe remove small sections of weedy Tea trees, Sydney Wattle and Brazilian pepper trees most years, CCA volunteers plant in their stead. CCA volunteers regularly have hand weeding sessions, particularly in spring (before seed sets) and in autumn (at sites to be planted in winter). A herbicide contractor (Biara Environmental) has been employed each Spring to target priority bulbous weeds – Black Flag (*Ferraria crispa*) & *Lachenalia bulbifera* (red soldiers), also veldt grass and carnation weed.



**Pest control** – Rabbit baiting stations (Pindone oats) are set up each summer with good results. Town of Cottesloe has funded all herbicide work and all pest control at this site.

**Revegetation** – Since 2009 - each year CCA has planted approximately 500 native seedlings, using local provenance seed, collected and cleaned by CCA. Many species are specific only to this one natural area in Cottesloe – including *Lechenaultia linarioides*, *Scaevola anchusifolia* and *Xanthorrhoea preissii*.



(L) Victorian tea tree being removed 2009 (R) CCA volunteers planting (same site) 2009



The same area at Cottesloe Native Garden in July 2014

## 2.0 NAMP UPDATE PROPOSAL

The purpose of the review and update is not to rewrite the NAMP, but to update key elements of the plan to reflect current policy and the priorities of existing stakeholders. It also presents an opportunity to further develop management strategies and actions for priority areas based on experience gained during the implementation of the original NAMP.

The original document did not present specific empirical survey data that could be reassessed to provide evidence of management effectiveness over the period 2008 to 2013. It is therefore recommended that the update of the NAMP includes a significant component focusing on the collection of baseline data, such as vegetation mapping, so changes to the natural areas can be effectively measured.

There is also an opportunity, through the process of updating the NAMP, to improve the coordination of tasks and enhance internal procedures and processes that will facilitate the effective and efficient implementation of the updated NAMP.

### 2.1 AIMS OF THE PROPOSED REVIEW AND UPDATE

- Provide an up-to-date version of the NAMP outlining strategic guidance and site specific management actions for a 5 year period (2014-2019);
- Record changes to natural areas that have occurred during the timeframe set out in the first iteration of the plan (2008-2013);
- Provide baseline data of measurable criteria so management success can be monitored in future;
- Continue to provide a document endorsed by council that can be used to support future grant applications and budget allocations;
- Provide a useable framework for implementation with a higher degree of specificity regarding high priority natural areas;
- Continue to focus on the management and improvement of ENAs as priority over the conceptualisation of PNAs and review the allocation of sites as PNAs;
- Create a more succinct and practical document that contains achievable and measurable goals;
- Develop improved procedures for the coordination of tasks and implementation of the NAMP.

### 2.2 KEY ITEMS TO BE EXAMINED IN THE UPDATE

- Review and update the statutory planning and documentation that influences the plan (2.1 Planning). This includes, but not limited to, all relevant Acts, Regulation, guidelines and local planning schemes;
- Identify any changes to Social and physical environment and update where required;
- Review the existing management framework and update where required;
- Review prioritisation framework and update prioritisation table;
- Update weed management/prioritisation to suit new guidelines;
- Include specific data collection such as weed mapping and bushland condition for all ENA;
- Revise and update PNAs;
- Expand on priority ENA with site specific management plans.



Appendix 5 Weed Prioritisation after DPaW Prioritisation Ranking

Scientific Name	Common Names	DPaW Ranking	NAMP Priority
<i>Acacia longifolia</i>	Sydney Golden Wattle	H (G,H,I)	Mod
<i>Lupinus angustifolius</i>	Narrowleaf Lupin	H (G,H,I)	NEW
<i>Lupinus cosentinii</i>	Sandplain Lupin	H (G,H,I)	High
<i>Tamarix aphylla</i>	Athel Pine	H (G,H,I)	High
<i>Gazania linearis</i>	Gazania	H (H,I)	High
<i>Lachenalia reflexa</i>	Soldiers	H (H,I)	High
<i>Leptospermum laevigatum</i>	Victorian Teatree, Coast Teatree	H (H,I)	High
<i>Pennisetum setaceum</i>	Fountain Grass	H (H,I)	High
<i>Watsonia meriana</i> var. <i>meriana</i>	Watsonia	H (H,I)	
<i>Carpobrotus edulis</i>	Hottentot Fig	M (D,E,F)	Low
<i>Ferraria crispa</i>	Black Flag	M (D,E,F)	High
<i>Gladiolus caryophyllaceus</i>	Pink Gladiolus, Wild Gladiolus	M (D,E,F)	High
<i>Lactuca serriola</i>	Prickly Lettuce	M (D,E,F)	
<i>Oenothera drummondii</i>	Beach Evening Primrose	M (D,E,F)	Low
<i>Schinus terebinthifolius</i>	Brazilian Pepper	M (D,E,F)	High
<i>Euphorbia terracina</i>	Geraldton Carnation Weed	M (D,E,F,G)	High
<i>Nicotiana glauca</i>	Tree Tobacco	M (D,E,F,G)	NEW
<i>Agave americana</i>	Century Plant	L (B,C,D)	Low
<i>Ammophila arenaria</i>	Marram Grass	L (B,C,D)	Low
<i>Chamelaucium uncinatum</i>	Geraldton Wax	L (B,C,D)	Mod
<i>Dimorphotheca ecklonis</i>	Veldt Daisy	L (B,C,D)	Mod
<i>Lachenalia bulbifera</i>	Red Soldiers	L (B,C,D)	High
<i>Lobularia maritima</i>	Alyssum, Sweet Alyssum	L (B,C,D)	Low
<i>Lycium ferocissimum</i>	African Boxthorn	L (B,C,D)	High
<i>Oxalis pes-caprae</i>	Soursob	L (C)	Mod
<i>Pennisetum clandestinum</i>	Kikuyu, Kikuyu Grass	L (C)	High
<i>Stenotaphrum secundatum</i>	Buffalo Grass	L (C)	High
<i>Thinopyrum distichum</i>	Sea Wheat	L (C)	NEW
<i>Asparagus asparagoides</i>	Bridal Creeper	L (D)	High
<i>Asphodelus fistulosus</i>	Onion Weed	L (D)	Mod
<i>Conyza</i> sp.	Fleabane	L (D)	Low
<i>Ehrharta longiflora</i>	Annual Veldt Grass	L (D)	High
<i>Fumaria capreolata</i>	Climbing Fumitory, Whiteflower Fumitory	L (D)	Mod
<i>Hypochaeris glabra</i>	Flatweed, Smooth Catsear	L (D)	Low
<i>Lagurus ovatus</i>	Hare's Tail Grass	L (D)	Low
<i>Tetragonia decumbens</i>	Sea Spinach	L (D)	High
<i>Trachyantha divaricata</i>	Dune Onion Weed	L (D)	Mod
<i>Arctotheca calendula</i>	Capeweed, Cape Weed	L (D,E)	Mod
<i>Avena barbata</i>	Bearded Oat	L (D,E)	High
<i>Cynodon dactylon</i>	Couch	L (D,E)	High
<i>Ehrharta calycina</i>	Perennial Veldt Grass	L (D,E)	High
<i>Freesia alba</i> x <i>leichtlinii</i>	Freesia	L (D,E)	High
<i>Pelargonium capitatum</i>	Rose Pelargonium	L (D,E)	High
<i>Ehrharta brevifolia</i> var. <i>cuspidata</i>	Veldtgrass	N (A)	NEW
<i>Agave americana</i> var. <i>picta</i>	Century Plant	N (A,B)	Low
<i>Argyranthemum frutescens</i>	Marguerite Daisy, Marguerite	N (A,B)	Low
<i>Lagunaria patersonia</i> subsp. <i>patersonia</i>	Norfolk Island Hibiscus	N (A,B)	
<i>Matthiola incana</i>	Stock, Common Stock	N (A,B)	Low
<i>Tropaeolum majus</i>	Nasturtium, Garden Nasturtium	N (A,B)	NEW
<i>Euphorbia paralias</i>	Sea Spurge	N (B)	Mod
<i>Romulea rosea</i>	Guildford Grass	N (B)	Mod
<i>Ursinia anthemoides</i>	Ursinia	N (B)	Low
<i>Melaleuca nesophila</i>	Freeway Melaleuca, Mindiyed	FAR	
<i>Arctotis stoechadifolia</i>	White Arctotis		NEW
<i>Asteraceae</i> sp.	Thistle		Mod
<i>Coprosma repens</i>	Mirror Plant, Looking Glass Bush		Low
<i>Digitaria sanguinalis</i>	Summer Grass		Low
<i>Ipomoea</i> sp.	Morning Glory		Mod

**H** - high (objective is eradication or control to reduce)

**M** - medium (objective is control to reduce or containment)

**L** - low (objective is containment at key sites only)

**N** - negligible (no action to be undertaken but may include monitoring only)

**FAR** - further assessment required and species will not proceed through ranking process, however this species may require ongoing monitoring in the field

**NEW** – indicates new weed records since the NAMP issue. As outlined in the NAMP, not all weed species are captured due to time and detail of the survey.

**Examples of management actions that may be considered for each ranking**

**A** - no action (the weed species ranking is so low as to not warrant any investment in regional strategic management actions)

**B** - monitor only (aims to detect any significant changes in the species' weed risk or management ability)

**C** - improve general weed management (aims to minimise weed impact and maintain the overall biodiversity, social, cultural and economic values in the region through improved general weed management)

**D** - protect priority sites (aims to prevent spread of weed species to key sites/assets of high biodiversity, social, cultural or economic value)

**E** - targeted control to reduce infestations at priority sites (may include biocontrol) (aims to significantly reduce the impact of a weed species on key sites/assets of high biodiversity, social, cultural or economic value through targeted management)

**F** - contain regional spread (aims to prevent the ongoing spread of the weed species in the region)

**G** - reduce regional infestations (may include biocontrol) (aims to significantly reduce the extent of the weed species in the region)

**H** - regional eradication (aims to remove the weed species from the region)

**I** - statewide eradication (aims to remove the weed species from the state)

Appendix 6 Priority Weed Matrix for Maintenance and Restoration Priority Areas

Species name	Common name	C3	C4	N1	N2	N3	N4	N12	GMP	CNG	S15	S7	S5	S1	Optimum treatment time	Control Options
<i>Acacia longifolia</i>	Sydney Golden Wattle														Mar - Aug	Hand pull seedlings. Fell mature plants. Apply 250 ml Access® in 15 L of diesel to basal 50 cm of trunk, or cut and paint or drill and fill with 50% Glyphosate. Older plants can be ringbarked. Monitor site for recruitment from seedbank.
<i>Ammophila arenaria</i>	Marram Grass														Sep - Nov	Dig out small infestations (best in Mar - May). Alternatively spray with 1% Glyphosate + penetrant. Slashing in Autumn can make spraying easier - <b>Consider potential for erosion prior to doing this!</b> Requires ongoing manual removal and/or treatment of regrowth.
<i>Arctotheca calendula</i>	Cape Weed														Jun - Nov	Cut out small infestations, ensuring root is severed well below ground level to prevent re-sprouting from the crown. Spot spray 1% Glyphosate. A combination of chemical and physical control with follow up treatment provides optimal control.
<i>Arctotis stoechadifolia</i>	White Arctotis														Mar - Oct	Try manually removing small/isolated populations. Spray with 1% Glyphosate
<i>Argyranthemum frutescens</i>	Marguerite Daisy														All year	Hand pull small infestations.
<i>Asparagus asparagoides</i>	Bridal Creeper														Jul - Aug	Spray 0.2 g metsulfuron methyl + Pulse® in 15 L water (or 2.5 - 5g /ha + Pulse®). Best results achieved when flowering.
<i>Cenchrus clandestinum</i>	Kikuyu														Nov - Jan	Spray with 1% Glyphosate or Fusilade® Forte at 16 ml/L + wetting agent or for generic fluazifop-p (212g/L active ingredient) 10ml/L + wetting agent. 2-3 sprays over a single growing season are often required.
<i>Cenchrus setaceus</i>	Fountain grass														Mar - Apr and Nov - Dec	Dig out small infestations, slash in winter and/or spray with 1% Glyphosate + penetrant in spring to autumn. Follow up seedling control and treatment until regrowth ceases.
<i>Chamelaucium uncinatum</i>	Geraldton wax														All year	Cut to base and paint with 50% Glyphosate.
<i>Conyza sp</i>	Fleabane														Jun - Sep	Hand remove small and/or isolated infestations prior to seed set. Timing of application is key to the efficacy of any herbicide treatment. Most susceptible to Glyphosate at the rosette stage and least susceptible at flowering. Apply Glyphosate when plants are small (at rosette stage <10cm across) 25 ml/ 10L after stem elongation and before flowering and actively growing. Otherwise 50% Glyphosate can be used to wipe the stems of plants. At later stages, it is difficult to control with any single herbicide treatment.
<i>Cynodon dactylon</i>	Couch														Nov - Feb	Small infestations may be dug out, ensuring removal of all rhizomes and stolons, however it is difficult to eradicate without herbicides. Spray Fusilade® Forte at 13 ml/L + wetting agent or for generic fluazifop-p (212g/L active ingredient) 8ml/L + wetting agent when plants are small and beginning new growth, or 1% Glyphosate in late spring/summer and autumn when rhizomes are actively growing. In sensitive areas try painting runners or crowns with 50% Glyphosate. Follow-up is nearly always required.
<i>Dimorphotheca ecklonis</i>	Veldt Daisy														All year around	Manually remove or spray with 2% Glyphosate
<i>Ehrharta brevifolia</i>	Annual Veldt Grass														Jul - Sep	Spot spray 1% Glyphosate.
<i>Ehrharta calycina</i>	Perennial Veldt Grass														Nov - Feb	For small infestations, cut out plants ensuring crown removal. Do not slash. Alternatively spray with Fusilade® Forte 13 ml/L or 6.5 L/ha + wetting agent on actively growing and unstressed plants. For generic fluazifop-p (212g/L active ingredient) 8ml/L or 4L/ha + wetting agent. Follow-up in subsequent years.
<i>Euphorbia paralias</i>	Sea Spurge														Sep - Jan	Hand remove small isolated infestations, ensuring use of appropriate personal protective equipment and safety guidelines. When actively growing, spray with 50 mL Glyphosate (360 g/L) + 0.2 g metsulfuron + Pulse® in 10 L water.
<i>Euphorbia terracina</i>	Geraldton Carnation Weed														Jun - Aug	Logran® at 12.5 g/100L + the penetrant Pulse® is very effective on adults and juveniles with little off target damage in coastal heathlands. Hand removal can stimulate germination of the soil seedbank. Ensure adequate personal protective clothing is worn to avoid contact with sap. Since seed production is highest from plants which emerge early, it is important to control early cohorts, if not treated when small these become increasingly tolerant to herbicides. Control of the late emergents before seed formation will prevent fresh seeds being added to the existing seed bank. Slashing in November after seed production may result in no vegetative regeneration, due to lack of food reserves in the underground roots and stem - the remaining underground plant parts cannot withstand hot dry summer conditions.



Species name	Common name	C3	C4	N1	N2	N3	N4	N12	GMP	CNG	S15	S7	S5	S1	Optimum treatment time	Control Options
<i>Ferraria crispa</i>	Black Flag														Aug - Sep	Hand remove very small populations in degraded sites. Sift soil to find all corms. Spray 2,2 DPA 10 g/L + Pulse® when flowering. In degraded sites try Glyphosate 1% + metsulfuron methyl 0.2 g/15 L + Pulse®. Takes a number of years to control populations.
<i>Freesia alba x leichtlinii</i>	Freesia														Jul - Aug	Spray metsulfuron methyl 0.2 g/15 L + Pulse® or 2.5-5 g/ha + Pulse®. Apply just on flowering at corm exhaustion.
<i>Fumaria capreolata</i>	White Fumitory														Jul - Sep	Spray metsulfuron methyl at 0.1 g/15 L (2.5 g/ha) + wetting agent or Glyphosate 0.5%.
<i>Gazania linearis</i>	Gazania														Apr - Jun	Manually remove isolated or small infestations prior to or at flowering. Spray plants until just wet with 5% Glyphosate or 4g of Lontrel 750 plus 25ml of Pulse in 10 L of water.
<i>Lachenalia bulbifera</i>	Red Soldiers														Aug - Sep	Spot spray metsulfuron methyl 0.2 g/15 L + Pulse® or 2.5-5 g/ha + Pulse®. Apply just on flowering at corm exhaustion. Physical removal can result in spread of bulbils.
<i>Lachenalia reflexa</i>	Yellow Soldiers														July	Spot spray metsulfuron methyl 0.2 g/15 L + Pulse® (2.5g-5 g/ha). Read the manufacturers' labels and material safety data sheets before using herbicides.
<i>Leptospermum laevigatum</i>	Coast Tea Tree														Jul - Oct	Hand pull seedlings. Fell mature plants. Resprouting has been recorded in some areas. Where resprouting has been observed, apply 250 ml Access® in 15 L of diesel to bottom 50 cm of trunk (basal bark).
<i>Lupinus angustifolius</i>	Narrow-Leaf lupin														Jul - Sep	Hand remove scattered plants. Spray dense infestations with metsulfuron methyl 0.1 g/15 L (2-3 g/ha) + wetting agent or spot spray Lontrel® 6 ml/10 L (300 ml/ha) + wetting agent to late flowering, this will prevent seed set.
<i>Lupinus cosentinii</i>	Blue Lupin														Jun - Sep	Hand remove scattered plants prior to flowering. Spray dense infestations with metsulfuron methyl 0.1g/15 L (2-3 g/ha) + wetting agent. Larger areas can be treated with more selective herbicides such as 200 g/ha Lontrel® or 50 g/ha Logran® (based on 500 L of water/ha). For spot spraying use 4 g Lontrel® or 1 g Logran® in 10 L of water + wetting agent. Glyphosate is relatively ineffective.
<i>Matthiola sp</i>	Stocks														All year around	Manually remove or spray with 2% Glyphosate
<i>Pelargonium capitatum</i>	Rose Pelargonium														Jun - Oct	Hand pull isolated plants taking care to remove the entire stem as it can reshoot from below ground level. Spot spray metsulfuron methyl 5 g/ha + Pulse®.
<i>Schinus terebinthifolius</i>	Brazilian pepper														Dec - Mar	Hand pull seedlings ensuring removal of all root material. Stem inject older plants using 50% Glyphosate or basal bark with 250 ml Access® in 15 L of diesel to bottom 50 cm of trunk during summer. Avoid root disturbance until trees are confirmed dead.
<i>Stenotaphrum secundatum</i>	Buffalo grass														Nov - May	Spray with 1% Glyphosate 2-3 times over a single growing season, alternatively spray Fusilade® Forte 13ml/L + wetting agent or for generic fluazifop-p (212g/L active ingredient) 8ml/L. Solarisation over warmer months can be useful for small, isolated infestations.
<i>Tetragonia decumbens</i>	Sea Spinach														Sep - Nov	Manually remove isolated or small infestations prior to flowering. 1%Tordon® or Grazon® are the likely to provide high levels of control.
<i>Thinopyrum distichum</i>															Sep - Nov	Dig out small infestations (best in Mar - May). Alternatively spray with 1% Glyphosate + penetrant. Slashing in Autumn can make spraying easier - <b>Consider potential for erosion prior to doing this but not as crucial as for Marrarm grass.</b> Requires ongoing manual removal and/or treatment of regrowth.
<i>Trachyandra divaricata</i>	Dune Onion Weed														Jun - Aug	Manually remove isolated or small infestations prior to flowering. Wipe with 50% Glyphosate solution before flowering. For dense infestations in degraded areas spot spray 0.4 g chlorosulfuron plus 25 ml wetting agent in 10 L of water when plants actively growing.
<i>Tropaeolum majus</i>	Garden Nasturtium														April - July	Manually remove isolated or small infestations prior to flowering. Spray small germinants with 1% Glyphosate and wetting agent.
<i>Watsonia meriana</i>	Wild Watsonia														Sep	Wipe individual leaves with Glyphosate 10% or spray dense infestations 2,2-DPA 10 g/L + Pulse®. Apply just as flower spikes emerge at corm exhaustion.