

NEWLAND HEAD CONSERVATION PARK
BIODIVERSITY ACTION PLAN





**Government
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Natural Resources
Adelaide and Mt Lofty Ranges

T&M Ecologists

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1. INTRODUCTION

The purpose of this Biodiversity Action Plan is to assist managers in their efforts to protect and conserve the terrestrial, coastal and estuarine values of Newland Head Conservation Park. The Plan aims to document the key biodiversity values and threats within the Park and to prioritise the management of the threats for effective biodiversity conservation.

This Biodiversity Action Plan will complement and reinforce activities that have been conducted at Newland Head Conservation Park to date, including weed control, introduced animal control and revegetation. On-ground managers include Natural Resources Adelaide and Mount Lofty Ranges (NR AMLR) and the SA Department of Environment, Water & Natural Resources (DEWNR) and Friends of Newland Head Conservation Park (FNHCP) who have been controlling weeds and undertaking revegetation in the Park for the last 20 years. It is intended as a guide for management over the next 5 years with actions prioritised to ensure that time, effort and funding is spent appropriately to maximise biodiversity benefits.

The Newland Head Conservation Park Biodiversity Action Plan is intended to align with, and contribute to, the objectives and the strategies of the following plans:

- The *Adelaide and Mount Lofty Ranges Natural Resources Management Plan* (2013) which outlines the Adelaide and Mt Lofty Ranges NRM Board's 10 year strategic plan, as well as investment priorities over a three-year period. This includes the establishment of long-term goals and clearly defined targets.
- The *Southern Fleurieu Coastal Action Plan and Conservation Priority Study* (SFCAP)¹ which covers the coast from Myponga Beach to Goolwa. SFCAP'S goal is to understand and facilitate the conservation, protection and maintenance of the region's natural coastal resources and to establish conservation priorities for places and areas within the region.
- The *Regional Recovery Plan for Threatened Species and Ecological Communities of Adelaide and the Mount Lofty Ranges 2009-2014*².

¹ Caton et al, 2007.

² Wilson and Bignall, 2009.

2. STUDY AREA

Newland Head Conservation Park is approximately 1,152 hectares in area and is located on the south coast of the Fleurieu Peninsula, approximately 15km southwest of Victor Harbor, within the City of Victor Harbor council (Figure 1).

Newland Head Conservation Park was proclaimed in 1985, with additional closed road reserves included in 1991 - 1992 and the coastal strip known as Waitpinga Cliffs added in 2010. The Park includes Waitpinga and Parsons Beaches, the Waitpinga Creek estuary, an extensive coastal dune system, fringing coastal woodland/mallee and coastal cliffs. See Table 1 for land parcels that are part of Newland Head Conservation Park.

Table 1. Newland Head land parcels

Parcel	Title details
1376	CR 5778 Folio 27
1377	CR 5778 Folio 27
1378	CR 5778 Folio 27
1379	CR 5778 Folio 27
1380	CR 5778 Folio 27
1381	CR 5778 Folio 27
399	CR 5769 Foio 667
400	CR 5769 Foliio 668
Allotment 11, DP 57083	CR 5853 Foliio 122
Allotment 22, DP 56999	CR 5858 Folio 6
Allotment 40, DP 57000	CR 5853 Folio 599

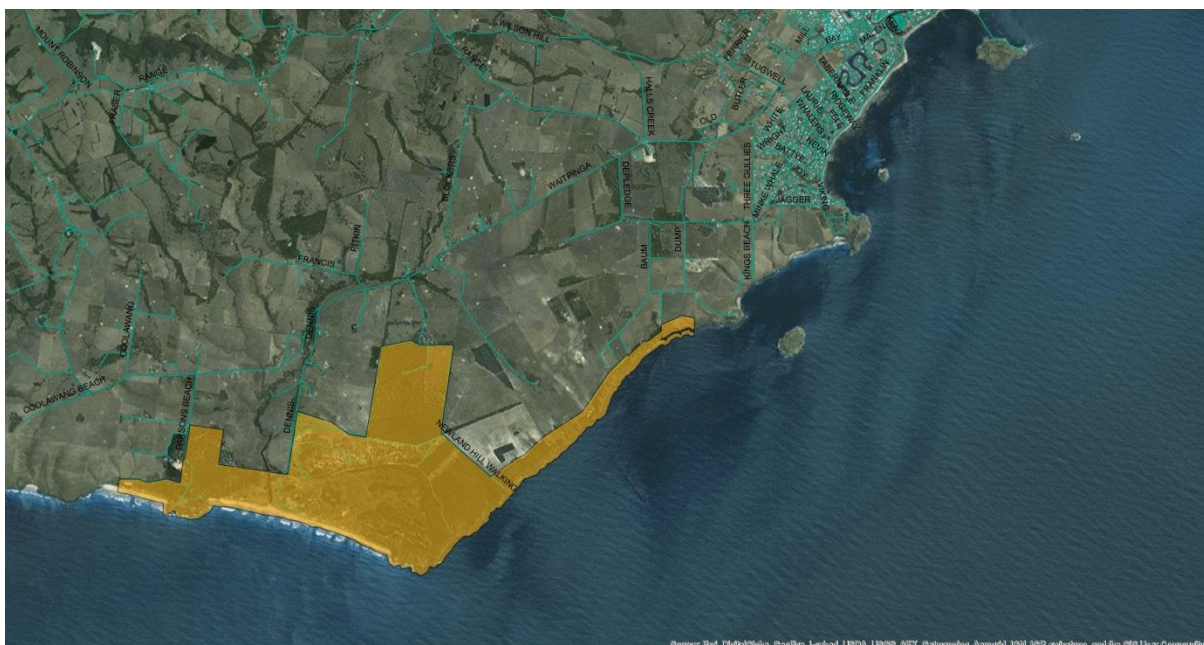


Figure 1: Newland Head Conservation Park location

2.1 Current land management

Newland Head Conservation Park is a single proclamation reserve under the care and control of the Department of Environment, Water and Natural Resources, with no provision for mineral

exploration or mining. Agencies and groups currently involved in the day to day management of the Park include:

- Department of Environment, Water & Natural Resources (DEWNR) - statutory authority
- Natural Resources Adelaide and Mount Lofty Ranges (NR AMLR)
- The Friends of Newland Head Conservation Park (FNHCP) – a non-government organisation/community group who have been working for more than 20 years, principally on weed, pest animal control, erosion control and revegetation.

2.2 Surrounding and historical land use

Prior to European settlement the area was the home of the **Ngarrandjeri** people and the coastal and inland environments would have provided important seasonal food and other resources.

Newland Head Conservation Park is named after Reverend Ridgway Newland who established the first church in the area in 1846. From 1889 onwards the land was progressively cleared and grazed and the area was regularly burned. Fishing and wattle bark tanning were early industries. Today, the Conservation Park features the historic remains of Dennis Hut, constructed in 1890. Other European heritage sites include an old fig tree, historic farming equipment and an old dam site in the north of the Park (historical summary from Newland Head Conservation Park Management Plan, DEH 2004)..

Newland Head Conservation Park is surrounded by cleared land which is used for agriculture, grazing and rural residential living.

2.3 Regional significance

The Park conserves spectacular coastal scenery and includes the impressive Waitpinga and Parsons Beaches, which are separated by Parsons Headland. At the eastern end of Waitpinga Beach, Newland Head dominates the landscape and is backed by an extensive coastal dune system. Spectacular cliffs to the east of Newland Head support intact coastal cliff heath and low woodland vegetation and provide habitat for a range of cliff-dwelling bird, mammal and reptile species.

Newland Head Conservation Park lies near the western limit of the Murray Mallee botanic region and near the southern limit of the Mount Lofty Ranges botanic region and contains an extremely diverse range of flora. It is therefore an important part of the South Australian reserve system, and adds significantly to the conservation of a representative sample of the State's biological diversity.

The Park contains historic relics from colonisation and has important cultural, spiritual and archaeological values for the **Ngarrindjeri** people, including Aboriginal story lines and areas of ceremonial significance.

Newland Head Conservation Park is a popular recreation destination for both local and visiting beach fishers and surfers and contains the nearest ocean beaches to metropolitan Adelaide. The Park, together with Deep Creek Conservation Park, contains one of the most spectacular sections of the 1200km Heysen Trail which extends from Cape Jervis on the southern Fleurieu Peninsula to Parachilna in the northern Flinders Ranges.

3. AIM AND OBJECTIVES OF THE PLAN

The aim of the Biodiversity Action Plan for Newland Head Conservation Park is primarily to address the focal biodiversity management issues and actions identified in the Southern Fleurieu Coastal Action Plan (SFCAP) 2007. The SFCAP provides a detailed assessment of the state of natural coastal resources across the region and a major part of the report is the description and analysis of “coastal cells”. Local management recommendations and priority actions are listed for each cell. Newland Head Conservation Park is situated within SFCAP’s Cell F14 ‘Petrel Cove to Newland Head’ and Cell 15 ‘Newland Head to Parson Beach’. The issues and proposed actions identified in the SFCAP which relate to Newland Head Conservation Park are:

Issue	Proposed Action	Priority
High value vegetation together with many high priority weeds	<ul style="list-style-type: none"> • Continue detailed work to promote indigenous species through erosion control, weed control and planting. • Continue and extend targeted weed control strategies aimed at ‘red alert’ weeds. • Further implementation of the Newland Head Conservation Park Management Plan 2004. • One issue not identified in the Management Plan but raised in the SFCAP is the significance of butterfly larvae habitat as recorded by Grund (1997). 	High

The intention of this Biodiversity Action Plan for Newland Head Conservation Park is to provide the information needed to address the local management actions identified in the SFCAP. The objectives are to:

- Clearly identify priority issues relating to the management of remnant vegetation and landforms within the study area;
- List actions that are recommended to protect and enhance the conservation value of the area;
- Identify priority issues relating to public usage (which impact on biodiversity) and any actions that are recommended to ensure that human activity is managed in a sustainable manner; and
- Identify and address other relevant natural resource management matters identified within the study area during the course of the project.

The Plan is intended as a guide for specific and prioritised “on-ground” works over the next 5 years with the aim being to maximise the protection of the biodiversity values of Newland Head Conservation Park. The Plan specifically deals with threats to biodiversity within the Park, however linkages and integration with other land uses and influencing processes in surrounding areas are also addressed. The Plan also considers the strong community interest in Newland Head Conservation Park and supports the partnered work that Department of Environment, Water and Natural Resources (DEWNR) and Natural Resources Adelaide and Mount Lofty Ranges (NRAMLRL) undertake with the relevant stakeholders.

The preparation of the Biodiversity Action Plan has involved:

- Review of previous biodiversity surveys and related studies;
- Stakeholder consultation and ongoing liaison;
- Field survey to map and record vegetation associations, plants of conservation significance, weeds and other management issues;
- Recording of vertebrate pest evidence;
- Identification and prioritisation of actions necessary to improve the biodiversity values/environmental assets of the Park, with a focus on protecting the habitats of rare flora and fauna species; and
- Identification of appropriate and cost effective monitoring and research requirements.

4. ENVIRONMENTAL ASSETS

4.1 Landform and soils

The southern section of Newland Head Conservation Park is part of the Deep Creek Environmental Association 3.2.2. This is described as “Dissected ridge with coastal cliffs, beaches and dunes. Open parkland with sown pasture understory, remnants of woodland and forest.” The remainder of the Park is part of the Inman Valley Environmental Association 3.2.4, described as “A series of low dissected ridges and spurs on tillite and arkose, with dunes and beaches or cliffs along the coast”.

Newland Head Conservation Park comprises dissected plateaux, cliffs and reefs of Kanmantoo Series sediments, clifftop dunes (at Newland Head) and calcarenite. Dunes at Parsons and Waitpinga occur over a sloping calcarenite ramp. The shoreline includes very steep, high cliffs and sandy beaches. Soils largely comprise deep sands and shallower sands with abundant surface limestone.

4.2 Native vegetation communities

The vegetation of Newland Head Conservation Park can be broadly categorised into woodland/mallee, coastal/sub-coastal dune, clifftop/coastal escarpment, and estuarine communities. These communities are described below (Table 2) and delineated in Figure 2.

Table 2: Vegetation communities, Newland Head Conservation Park

Community Description	Community Location
Woodlands and Mallee	
<i>Eucalyptus diversifolia</i> , <i>E. cosmophylla</i> +/- <i>E. fasciculosa</i> Open Mallee Forest over <i>Banksia marginata</i> , <i>Olearia ramulosa</i> , <i>Brachyloma ericoides</i> , * <i>Asparagus asparagoides</i> , <i>Hibbertia australis</i> .	North-west section of the Park on Sn 1377 (inland from coast).
<i>Eucalyptus fasciculosa</i> +/- <i>E. leucoxylon</i> +/- <i>Allocasuarina verticillata</i> Woodland with an open understorey dominated by <i>Acacia paradoxa</i> , <i>Olearia ramulosa</i> , <i>Rhagodia candolleana</i> ssp. <i>candolleana</i> and <i>Hibbertia virgata</i> with a groundlayer which is dominated by weedy grasses and herbs, including * <i>Asparagus asparagoides</i> .	North-west section of the Park on Sn 1377 (inland from coast).
<i>Eucalyptus fasciculosa</i> , <i>E. cosmophylla</i> Low Woodland	On pockets of deeper sandy soil towards eastern end of Waitpinga Cliffs
<i>Eucalyptus cosmophylla</i> +/- <i>E. fasciculosa</i> Low Open Woodland (revegetation)	This is a block of revegetation at the eastern end of the park in Allotment 22 which had been grazed for the past 150 years. Planting commenced in 2001.
<i>Eucalyptus diversifolia</i> +/- <i>E. cosmophylla</i> +/- <i>E. fasciculosa</i> +/- <i>Melaleuca lanceolata</i> Mallee with an understorey dominated by <i>Xanthorrhoea semiplana</i> , <i>Daviesia brevifolia</i> .	Intact scrub areas of Sections 1380, includes previously burnt areas (2011) and extending along the Waitpinga cliffs
<i>Eucalyptus diversifolia</i> +/- <i>E. fasciculosa</i> (patchy) Mallee	Previously cleared/grazed areas of Sn 1380
<i>Eucalyptus diversifolia</i> , <i>Melaleuca lanceolata</i> Very Low Open Forest/Mallee	Occurs in back-dune areas of Sn 1380
Coastal Dunes	

Community Description	Community Location
<i>Spinifex hirsutus</i> , * <i>Thynopyrum junceiforme</i> , * <i>Ammophila arenaria</i> Tussock Grassland	Foredune
<i>Olearia axillaris</i> +/- <i>Acacia sophorae</i> +/- <i>Leucopogon parviflorus</i> +/- <i>Myoporum insulare</i> Shrubland over <i>Rhagodia candolleana</i> ssp. <i>candolleana</i> , <i>Pimelea serpyllifolia</i> ssp. <i>serpyllifolia</i> , <i>Tetragonia implexicoma</i> +/- <i>Muehlenbeckia gunnii</i> +/- <i>Dianella brevicaulis</i> .	This community occurs on dune slopes and in swales behind the foredunes
<i>Eucalyptus diversifolia</i> +/- <i>Leucopogon parviflorus</i> +/- <i>Acacia sophorae</i> +/- <i>Olearia axillaris</i> Shrubland	Occurs in the backdunes behind Parsons Beach and the western end of Waitpinga
<i>Olearia axillaris</i> , <i>Acacia uncifolia</i> Shrubland	Backdune areas of Sn 1380
Cliff-top and coastal escarpment heath	
+/- <i>Leucophyta brownii</i> +/- <i>Lomandra effusa</i> Low Open Shrubland/Tussock Grassland	Occurs on cliff-tops at the western end of the park adjacent to Parsons Beach
<i>Eucalyptus cosmophylla</i> , <i>E. diversifolia</i> +/- <i>E. fasciculosa</i> +/- <i>E. cneorifolia</i> Very Low Open Woodland over a range of low shrubs including <i>Adenanthos terminalis</i> , <i>Brachyloma ericoides</i> ssp. <i>ericoides</i> , <i>Cassinia uncata</i> .	Occurs along the Waitpinga cliffs.
<i>Beyeria lechenaultii</i> , <i>Olearia axillaris</i> +/- <i>Acrotriche cordata</i> Low Shrubland with emergent <i>Eucalyptus diversifolia</i> , <i>Melaleuca lanceolata</i> , <i>Leucopogon parviflorus</i>	Occurs on the Newland Head cliff tops and coastal escarpments
<i>Eucalyptus diversifolia</i> , <i>Leucopogon parviflorus</i> +/- <i>Melaleuca lanceolata</i> Shrubland	Occurs on the more landward Newland Head cliff tops
Estuarine (Waitpinga Creek)	
<i>Duma florulenta</i> Tall Open Shrubland <i>Juncus kraussii</i> , <i>Ficinia nodosa</i> , <i>Cyperus vaginatus</i> Sedgeland <i>Sarcocornia quinqueflora</i> Saltmarsh <i>Typha domingensis</i> Sedgeland	The estuary closely follows the natural flow path of Waitpinga Creek, spreading out across flatter coastal areas and forming saltmarshes in parts
Other	
<i>Ehrharta calycina</i> , <i>Phalaris</i> sp. Grassland with emergent plantings	A small area of revegetation undertaken in 2007, known as "Firetail Haven" – Waitpinga Cliffs section
<i>Ehrharta</i> spp., <i>Trifolium</i> spp., <i>Vulpia</i> sp. with emergent <i>Xanthorrhoea semiplana</i> & <i>Eucalyptus diversifolia</i> and areas of tree and shrub plantings	Occurs in previously cleared farmland and quarry area east of Dennis Road
Cleared Park Boundary	

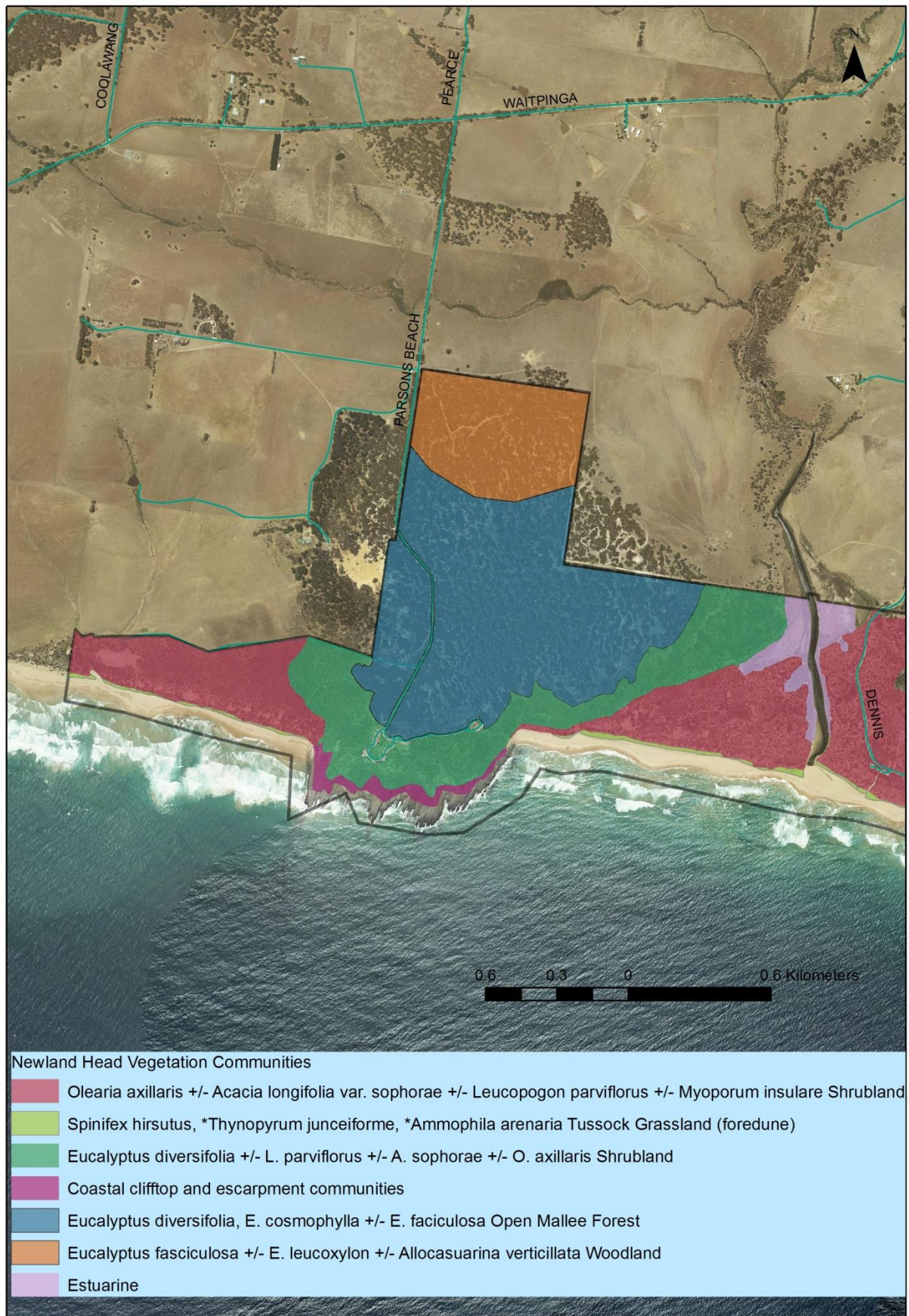


Figure 2-1: Newland Head Conservation Park vegetation communities

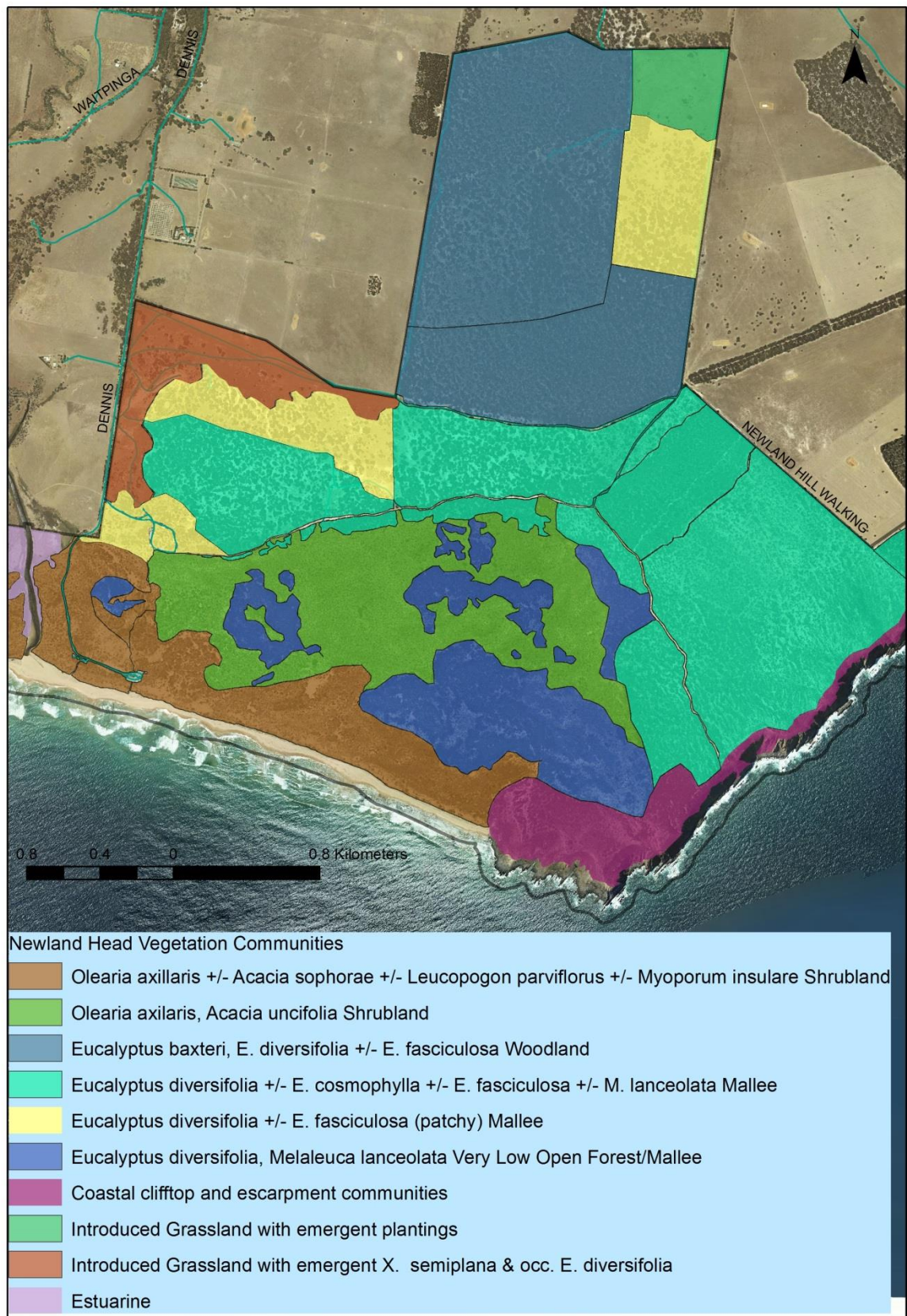


Figure 2-2: Newland Head Conservation Park vegetation communities



Figure 2-3: Newland Head Conservation Park vegetation communities

4.3 Significant flora species

Two species of national conservation significance are protected within the Park:

- Endangered *Euphrasia collina* occurs in low heath on the Waitpinga Cliffs, adjacent the Heysen Trail; and
- Vulnerable *Spyridium coactillifolium* occurs along or near the southern Fleurieu coast

Eighteen (18) species of State conservation significance have been recorded at Newland Head Conservation Park and a further 87 species are considered Rare, 54 species are considered Vulnerable and 18 species are considered Endangered at a regional level (Table 3). This reflects the scarcity of dune, clifftop and coastal woodland/mallee habitats in the region, as well as the variety, extent and condition of the habitats present, and illustrates the importance of the Park. Appendix 1 includes a full list of plant species.

Table 3: List of native plant species of conservation significance

Species	Conservation Status*		
	AUS	SA	AMLR
<i>Acacia cupularis</i>			RA
<i>Acacia uncifolia</i>			VU
<i>Acrotriche affinis</i>			RA
<i>Acrotriche cordata</i>			RA
<i>Actites megalocarpus</i>			RA
<i>Adenanthos terminalis</i>			RA
<i>Adriana quadripartita</i>			RA
<i>Allocasuarina pusilla</i>			RA
<i>Alyxia buxifolia</i>			RA
<i>Angianthus preissianus</i>			VU
<i>Apalochlamys spectabilis</i>			VU
<i>Apium annuum</i>			VU
<i>Argentipallium obtusifolium</i>			VU
<i>Asterolasia muricata</i>		R	EN
<i>Austrofestuca littoralis</i>			EN
<i>Austrostipa exilis</i>			RA
<i>Austrostipa macalpinei</i>			RA
<i>Austrostipa mundula</i>			RA
<i>Austrostipa stipoides</i>			VU
<i>Baeckea crassifolia</i>			VU
<i>Banksia ornata</i>			RA
<i>Billardiera uniflora</i>			VU
<i>Billardiera versicolor</i>			VU
<i>Brachyscome cuneifolia</i>			VU
<i>Brachyscome goniocarpa</i>			RA
<i>Brachyscome lineariloba</i>			RA
<i>Bromus arenarius</i>			EN
<i>Bulbine semibarbata</i>			VU

Species	Conservation Status*		
	AUS	SA	AMLR
<i>Caladenia bicalliata</i> ssp. <i>bicalliata</i>		R	EN
<i>Caladenia cardiochila</i>			EN
<i>Caladenia prolata</i>			RA
<i>Caladenia valida</i>		E	EN
<i>Calandrinia brevipedata</i>			RA
<i>Calandrinia corrigioloides</i>			RA
<i>Callistemon rugulosus</i>			RA
<i>Calytrix glaberrima</i>			RA
<i>Cassinia complanata</i>			RA
<i>Centrolepis cephaloformis</i> ssp. <i>cephaloformis</i>		R	VU
<i>Choretrum glomeratum</i>			RA
<i>Comesperma polygaloides</i>			VU
<i>Comesperma volubile</i>			RA
<i>Conospermum patens</i>			RA
<i>Correa alba</i> var. <i>pannosa</i>		R	VU
<i>Correa pulchella</i>			RA
<i>Corybas despectans</i>		R	RA
<i>Cotula vulgaris</i> var. <i>australasica</i>			RA
<i>Cryptandra hispidula</i>			RA
<i>Cullen australasicum</i>			RA
<i>Cymbonotus preissianus</i>			RA
<i>Cynoglossum austral</i>			RA
<i>Daviesia pectinata</i>		R	EN
<i>Dianella longifolia</i> var. <i>grandis</i>		R	VU
<i>Dillwynia sericea</i>			RA
<i>Diuris brevifolia</i>		E	VU
<i>Dodonaea humilis</i>			VU
<i>Duma florulenta</i>			VU
<i>Eucalyptus calycogona</i> ssp. <i>calycogona</i>			RA
<i>Eucalyptus cneorifolia</i>			VU
<i>Eucalyptus diversifolia</i> ssp. <i>diversifolia</i>			RA
<i>Eucalyptus fasciculosa</i>		R	
<i>Eucalyptus gracilis</i>			VU
<i>Eucalyptus incrassata</i>			RA
<i>Eucalyptus leptophylla</i>			RA
<i>Eucalyptus phenax</i> ssp. <i>compressa</i>			VU
<i>Eucalyptus rugosa</i>			VU
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	EN	E	EN
<i>Gahnia deusta</i>			RA
<i>Gahnia trifida</i>			RA
<i>Galium migrans</i> ssp. <i>migrans</i>			RA
<i>Gnaphalium indutum</i> ssp. <i>indutum</i>			RA

Species	Conservation Status*		
	AUS	SA	AMLR
<i>Goodenia varia</i>			RA
<i>Goodenia willisiana</i>			RA
<i>Grevillea ilicifolia ssp. ilicifolia</i>			VU
<i>Gyrostemon australasicus</i>			RA
<i>Haloragis aspera</i>			VU
<i>Hakea mitchellii</i>			VU
<i>Hemichroa pentandra</i>			EN
<i>Hydrocotyle capillaris</i>			RA
<i>Hydrocotyle comocarpa</i>		R	VU
<i>Isolepis stellata</i>			RA
<i>Kunzea pomifera</i>			RA
<i>Lachnagrostis billardierei ssp. billardierei</i>			RA
<i>Lasiopetalum baueri</i>			RA
<i>Lasiopetalum discolor</i>			VU
<i>Lasiopetalum schulzenii</i>			EN
<i>Leiocarpa supina</i>			VU
<i>Lepidobolus drapetocoleus</i>			RA
<i>Lepidosperma congestum</i>			RA
<i>Lilaeopsis polyantha</i>			VU
<i>Logania crassifolia</i>			RA
<i>Logania linifolia</i>			VU
<i>Logania minor</i>			EN
<i>Lomandra collina</i>			RA
<i>Lomandra juncea</i>			RA
<i>Lycium australe</i>			EN
<i>Melaleuca brevifolia</i>			VU
<i>Melaleuca lanceolata</i>			RA
<i>Micrantheum demissum</i>			RA
<i>Minuria leptophylla</i>			RA
<i>Myosotis australis</i>			RA
<i>Nicotiana maritima</i>			RA
<i>Olearia pannosa ssp. pannosa</i>			EN
<i>Orthoceras strictum</i>			RA
<i>Ozothamnus turbinatus</i>			EN
<i>Patersonia fragilis</i>			VU
<i>Pelargonium australe</i>			RA
<i>Philothea pungens</i>			VU
<i>Phyllanthus striaticaulis</i>			VU
<i>Phyllota pleurandroides</i>			VU
<i>Picris angustifolia ssp. angustifolia</i>			RA
<i>Picris squarrosa</i>			EN
<i>Poa halmaturina</i>			RA

Species	Conservation Status*		
	AUS	SA	AMLR
<i>Pomaderris obcordata</i>			RA
<i>Poranthera triandra</i>			VU
<i>Potamogeton pectinatus</i>			VU
<i>Prostanthera chlorantha</i>		R	RA
<i>Pseudanthus micranthus</i>		R	RA
<i>Pterostylis dolichochila</i>			RA
<i>Ptilotus erubescens</i>		R	RA
<i>Ptilotus spathulatus</i>			RA
<i>Puccinellia stricta</i>			RA
<i>Pultenaea densifolia</i>			VU
<i>Pultenaea tenuifolia</i>			RA
<i>Pultenaea viscidula</i>			VU
<i>Ranunculus amphitrichus</i>			RA
<i>Ranunculus hamatosetosus</i>			EN
<i>Ranunculus pachycarpus</i>			VU
<i>Rhodanthe laevis</i>			RA
<i>Rytidosperma duttonianum</i>			RA
<i>Santalum acuminatum</i>			RA
<i>Santalum murrayanum</i>			VU
<i>Sarcocornia blackiana</i>			RA
<i>Scaevola crassifolia</i>			VU
<i>Scaevola linearis ssp. confertifolia</i>			VU
<i>Schoenoplectus pungens</i>			RA
<i>Schoenus deformis</i>			VU
<i>Schoenus nitens</i>			RA
<i>Sclerolaena diacantha</i>			RA
<i>Spyridium coactilifolium</i>	VU	V	VU
<i>Stenopetalum lineare</i>			RA
<i>Stylidium perpusillum</i>			VU
<i>Styphelia exarrhena</i>			RA
<i>Swainsona lessertiifolia</i>			VU
<i>Thelymitra benthamiana</i>			RA
<i>Thelymitra holmesii</i>		V	EN
<i>Thyridia repens</i>			RA
<i>Thysanotus baueri</i>			VU
<i>Tricoryne tenella</i>			RA
<i>Triglochin trichophora</i>			VU
<i>Triodia compacta</i>			VU
<i>Utricularia tenella</i>			RA
<i>Velleia paradoxa</i>			RA
<i>Veronica hillebrandii</i>			VU
<i>Wahlenbergia luteola</i>			RA

Species	Conservation Status*		
	AUS	SA	AMLR
<i>Wilsonia backhousei</i>			EN
<i>Wilsonia humilis</i>			VU
<i>Wilsonia rotundifolia</i>			VU
<i>Xanthorrhoea semiplana ssp. tateana</i>		R	RA
<i>Xerochrysum bracteatum</i>			RA
<i>Zieria veronicea ssp. veronicea</i>			VU
<i>Zygophyllum billardierei</i>			EN

***Conservation status:**
AUS = Australia EPBC Act 1999: CR = Critically Endangered, EN = Endangered, VU = Vulnerable
SA = South Australia NPW Act 1972: E = Endangered, V = Vulnerable, R = Rare
AMLR = Adelaide and Mount Lofty Ranges Region³ CR = Critically Endangered, EN=Endangered, VU=Vulnerable, RA=Rare

4.4 Native Fauna

4.4.1 Mammals

Seven (7) indigenous mammal species have been recorded at Newland Head CP, including the nationally Endangered Southern Brown Bandicoot (*Isodon obesulus*) which was last recorded in the Park in 1984⁴. The following table includes a list of all mammals which have been recorded in the Park or are considered likely to occur in the Park.

Table 4: Mammal species known from Newland Head CP

Species	Common Name	Conservation status	
		EPBC Act	NPW Act
Terrestrial Mammals			
<i>Antechinus flavipes</i>	Yellow-footed Antechinus		V
<i>Cercartetus concinnus</i>	Western Pygmy-possum		
<i>Isodon obesulus</i>	Southern Brown Bandicoot	E	V
<i>Macropus fuliginosus</i>	Western Grey Kangaroo		
<i>Rattus fuscipes</i>	Bush Rat		
<i>Rattus lutreolus</i>	Swamp Rat		R
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna		
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R
Marine Mammals			
<i>Arctocephalus forsteri</i>	Long-nosed Fur Seal		R
<i>Delphinus delphis</i>	Short-beaked Common Dolphin		
<i>Eubalaena australis</i>	Southern Right Whale	E	V
<i>Hydrurga leptonyx</i>	Leopard Seal		R
<i>Megaptera novaeangliae</i>	Humpback Whale	V	V
<i>Neophoca cinerea</i>	Australian Sea-lion	V	V
<i>Tursiops aduncus</i>	Indian Ocean Bottlenose Dolphin		
Bats			
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat		
<i>Chalinolobus morio</i>	Chocolate Wattled Bat		

³ Gillam and Urban, 2014.

⁴ Atlas of Living Australia.

<i>Mormopterus planiceps</i>	Southern Freetail Bat		
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat		
<i>Saccolaimus flaviventris</i>	Yellow-bellied Shearwater Bat		R
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat		
<i>Tadarida australis</i>	White-striped Freetail bat		
<i>Vespadelus darlingtoni</i>	Large Forest Bat		
<i>Vespadelus regretus</i>	Southern Forest Bat		
<i>Vespadelus vulturnus</i>	Little Forest Bat		

Rating codes: R = Rare; V = Vulnerable; E=Endangered; EX = Extinct

*denotes introduced species

4.4.2 Birds

Table 5 lists the bird species of conservation significance which have been recorded from Newland Head Conservation Park. Appendix 2 includes a full list of bird species.

Table 5: Birds of conservation significance observed and/or likely to be utilising Newland Head CP as habitat

Species	Common Name	Conservation Status*		
		EPBC	SA	MLR
<i>Anhinga novaehollandiae</i>	Australasian Darter			VU
<i>Anthus novaeseelandiae</i>	Australasian Pipit			RA
<i>Anas rhynchotis</i>	Australasian Shoveler		R	RA
<i>Aegotheles cristatus</i>	Australian Owllet-nightjar			RA
<i>Pelecanus conspicillatus</i>	Australian Pelican			RA
<i>Tadorna tadornoides</i>	Australian Shelduck			VU
<i>Porzana fluminea</i>	Australian Spotted Crake			RA
<i>Porzana pusilla</i>	Baillon's Crake			VU
<i>Zoothera lunulata</i>	Bassian Thrush		R	EN
<i>Stagonopleura bella</i>	Beautiful Firetail		R	CR
<i>Cygnus atratus</i>	Black Swan			RA
<i>Thalassarche melanophris</i>	Black-browed Albatross		V	VU
<i>Phalacrocorax fuscescens</i>	Black-faced Cormorant			RA
<i>Euseyornis melanops</i>	Black-fronted Dotterel			RA
<i>Himantopus himantopus</i>	Black-winged Stilt			VU
<i>Oxyura australis</i>	Blue-billed Duck			VU
<i>Neophema chrysostoma</i>	Blue-winged Parrot		V	VU
<i>Accipiter fasciatus</i>	Brown Goshawk		R	LC
<i>Cincloramphus cruralis</i>	Brown Songlark			RA
<i>Acanthiza pusilla</i>	Brown Thornbill			VU
<i>Phaps elegans</i>	Brush Bronzewing			RA
<i>Gallirallus philippensis</i>	Buff-banded Rail			RA
<i>Thalassarche bulleri</i>	Buller's Albatross		V	
<i>Cereopsis novaehollandiae</i>	Cape Barren Goose		R	RA
<i>Hydroprogne caspia</i>	Caspian Tern			VU
<i>Ardea ibis</i>	Cattle Egret		R	VU
<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren	EN	E	EN
<i>Nymphicus hollandicus</i>	Cockatiel			RA

Species	Common Name	Conservation Status*		
		EPBC	SA	MLR
<i>Tringa nebularia</i>	Common Greenshank			VU
<i>Actitis hypoleucos</i>	Common Sandpiper		R	EN
<i>Stagonopleura guttata</i>	Diamond Firetail		V	EN
<i>Artamus cyanopterus</i>	Dusky Woodswallow			RA
<i>Numenius madagascariensis</i>	Eastern Curlew		V	
<i>Egretta sacra</i>	Eastern Reef Egret	M	R	CR
<i>Neophema elegans</i>	Elegant Parrot		R	VU
<i>Dromaius novaehollandiae</i>	Emu			VU
<i>Petrochelidon ariel</i>	Fairy Martin			RA
<i>Sternula nereis</i>	Fairy Tern	VU	E	CR
<i>Petroica phoenicea</i>	Flame Robin		V	CR
<i>Ardenna carneipes</i>	Flesh-footed Shearwater		R	
<i>Apus pacificus</i>	Fork-tailed Swift			RA
<i>Plegadis falcinellus</i>	Glossy Ibis		R	RA
<i>Cisticola exilis</i>	Golden-headed Cisticola			VU
<i>Phalacrocorax carbo</i>	Great Cormorant			RA
<i>Cracticus torquatus</i>	Grey Butcherbird			VU
<i>Thalassarche chrysostoma</i>	Grey-headed Albatross		V	
<i>Thinornis rubricollis</i>	Hooded Plover		V	EN
<i>Melanodryas cucullata</i>	Hooded Robin		R	CT
<i>Microeca fascinans</i>	Jacky Winter		R	CR
<i>Larus dominicanus</i>	Kelp Gull		R	RA
<i>Phoebastria palpebrata</i>	Light-mantled Sooty Albatross		E	
<i>Hieraetus morphnoides</i>	Little Eagle			EN
<i>Biziura lobata</i>	Musk Duck		R	VU
<i>Anas superciliosa</i>	Pacific Black Duck			VU
<i>Larus pacificus</i>	Pacific Gull			VU
<i>Turnix varius</i>	Painted Button-quail		R	VU
<i>Cacomantis pallidus</i>	Pallid Cuckoo			RA
<i>Geopelia striata</i>	Peaceful Dove			VU
<i>Falco peregrinus</i>	Peregrine Falcon		R	RA
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck			RA
<i>Lichenostomus cratitius</i>	Purple-gaped Honeyeater		R	
<i>Charadrius ruficapillus</i>	Red-capped Plover			EN
<i>Petroica goodenovii</i>	Red-capped Robin			RA
<i>Erythronyx cinctus</i>	Red-kneed Dotterel			VU
<i>Calidris ruficollis</i>	Red-necked Stint			VU
<i>Myiagra inquieta</i>	Restless Flycatcher		R	CR
<i>Neophema petrophila</i>	Rock Parrot		R	
<i>Calidris alba</i>	Sanderling	M	R	
<i>Petroica boodang</i>	Scarlet Robin		R	VU
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper			VU

Species	Common Name	Conservation Status*		
		EPBC	SA	MLR
<i>Chrysococcyx lucidus</i>	Shining Bronze-cuckoo			RA
<i>Thalassarche cauta</i>	Shy Albatross		V	
<i>Zosterops lateralis</i>	Silvereeye			VU
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher		R	EN
<i>Macronectes giganteus</i>	Southern Giant-petrel	EN	V	
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater			RA
<i>Porzana abuenis</i>	Spotless Crane		R	EN
<i>Eurostopodus argus</i>	Spotted Nightjar			RA
<i>Coturnix pectoralis</i>	Stubble Quail			NT
<i>Circus approximans</i>	Swamp Harrier			VU
<i>Gliciphila melanops</i>	Tawny-crowned Honeyeater			EN
<i>Daphoenositta chrysoptera</i>	Varied Sittella			VU
<i>Diomedea exulans</i>	Wandering Albatross	VU	V	
<i>Haliastur sphenurus</i>	Whistling Kite			EN
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle		E	EN
<i>Pomatostomus superciliosus</i>	White-browed Babbler			EN
<i>Epthianura albifrons</i>	White-fronted Chat			VU
<i>Melithreptus lunatus</i>	White-naped Honeyeater			VU
<i>Ardea pacifica</i>	White-necked Heron			VU
<i>Lalage sueurii</i>	White-winged Triller			RA
<i>Platalea flavipes</i>	Yellow-billed Spoonbill			VU
<i>Thalassarche chlororhynchos</i>	Yellow-nosed Albatross		E	
<i>Ptilotula ornatus</i>	Yellow-plumed Honeyeater			RA
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-cockatoo		V	VU

***Conservation Status**
AUS = Australia EPBC Act 1999: CE = Critically Endangered, EN = Endangered, VU = Vulnerable, M = Migratory
SA = South Australia NPW Act 1972: E = Endangered, V = Vulnerable, R = Rare, U = Uncommon
MLR = Mount Lofty Ranges Subregion: CR = Critically Endangered, EN=Endangered: rare and in danger of disappearing from the wild in the short term, VU=Vulnerable: rare and in danger of disappearing from the wild in the long term, RA=Rare: occurring infrequently, either locally abundant in a limited area or sparsely distributed over a wide area.

4.4.3 Reptiles and amphibians

Table 6 lists the reptile species which have been recorded from Newland Head CP or are considered likely to be present.

Table 6: Reptile species known from Newland Head CP

Scientific Name	Common Name	Previous y recorded source	Conservation status*			Comments ⁵
			AUS	SA	SML R	
<i>Aprasia striolata</i>	Lined Worm-lizard	3				Legless lizard, usually found sheltering under rocks, logs and other ground debris. Common and widespread on Southern Fleurieu coast.

⁵ Dr Tim Milne, Herpetologist and Caton et al, 2007.

Scientific Name	Common Name	Previous y recorded source	Conservation status*			Comments ⁵
			AUS	SA	SML R	
<i>Austrelaps labialis</i>	Pygmy Copperhead	3			R	Rare on Fleurieu Peninsula. Likely to be an isolated population in Newland Head Conservation Park.
<i>Christinus marmoratus</i>	Marbled Gecko	1,3				Nocturnal gecko. Common and widespread on Southern Fleurieu coast.
<i>Ctenotus spaldingi</i>	Eastern Striped Skink				R	Has not been recorded in the Park, but records exist for nearby, so is considered to be likely to be present.
<i>Egernia cunninghami</i>	Cunningham's Skink	1,2		V	E	Restricted distribution on Southern Fleurieu coast. Recently recorded in Newland Head. Lives in colonies in deep rocky crevices.
<i>Hemiergis decresiensis</i>	Three-toed Earless Skink	3				Requires rocks, logs and natural ground debris for shelter. Common in loamy soils.
<i>Hemiergis peronii</i>	Four-toed Earless Skink	1			R	Requires rocks, logs and natural ground debris for shelter. Common in sandy soils.
<i>Lampropholis guichenoti</i>	Garden Skink	1,3				Common and widespread on Southern Fleurieu coast.
<i>Lerista bougainvillii</i>	Bougainville's Skink	3				Requires rocks, logs and natural ground debris for shelter. Common and widespread on Southern Fleurieu coast.
<i>Lerista dorsalis</i>	Four-toed Slider	1,3			R	Requires rocks, logs and natural ground debris for shelter. Restricted distribution on Southern Fleurieu coast
<i>Liopholis whitii</i>	White's Skink	1				Common and widespread in heath and woodland habitats on sand and loam soils on Fleurieu Peninsula.
<i>Menetia greyii</i>	Dwarf Skink	3			NT	Small, active diurnal skink. Widespread across Australia. Common and widespread on Southern Fleurieu coast.
<i>Morethia obscura</i>	Mallee Snake-eye	1,3			R	Common but with restricted distribution on Southern Fleurieu coast.
<i>Parasuta flagellum</i>	Little Whip Snake	3				Small, nocturnal elapid snake that feeds on skinks. Recorded just outside park boundary to the north of Parson's Beach.

Scientific Name	Common Name	Previous y recorded source	Conservation status*			Comments ⁵
			AUS	SA	SML R	
<i>Pogona barbata</i>	Eastern Bearded Dragon	1,3				Semi-arboreal species. Common and widespread on Southern Fleurieu coast.
<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake	1				Common and widespread on Southern Fleurieu coast.
<i>Pseudonaja textilis</i>	Eastern Brown Snake	1,3				Common diurnal snake. Common and widespread on Southern Fleurieu coast.
<i>Pygopus lepidopodus</i>	Common Scaly-foot	1,3			R	Uncommon but widespread distribution. Prefers habitats with a diverse understorey structure in good condition.
<i>Tiliqua rugosa</i>	Sleepy Lizard	1,3				Widely distributed large skink. Shelters under "fallen timber, leaf litter, spinifex and other grasses ⁶ ". Common and widespread on Southern Fleurieu coast.
<i>Tiliqua scincoides</i>	Eastern Bluetongue	1				Widely distributed large skink. "Shelters at night in hollow logs, ground debris etc. ⁷ " Common and widespread on Southern Fleurieu coast.
<i>Varanus gouldii</i>	Sand Goanna	2,3			V	Photographed in 2010 and identification confirmed. Very few other records on the Fleurieu Peninsula. May have been released in Park?
<i>Varanus rosenbergi</i>	Heath Goanna	1		V	CE	Highly threatened species in South Australia, with a very restricted distribution. Would be good to confirm presence in the Park.

***Conservation status:** CE = Critically Endangered, E = Endangered, V = Vulnerable, R = Rare, NT = Near Threatened
Previous Source: 1= DEH (2004). Newland Head Conservation Park Management Plan. Department for Environment and Heritage, Adelaide. 2= Seiji Iwao pers. comm., 3=Atlas of Living Australia www.ala.org.au accessed 22/1/2016

Six (6) species of amphibian have been recorded within a 5km radius⁸ of the centre of Newland Head Conservation Park (Table 7).

Table 7: Frog species known from the Newland Head area

Scientific Name	Common Name	Rating	Comments
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⁶ Cogger, H.G. (1992). *Reptiles and Amphibians of Australia*. Reed Books, Chatswood.

⁷ Cogger, H.G. (1992). *Reptiles and Amphibians of Australia*. Reed Books, Chatswood.

⁸ Living Atlas of Australia

		AUS ⁹	SA ¹⁰	AMLR ¹¹	
<i>Crinia signifera</i>	Common Froglet				Small frog, recorded in the dam within the Park.
<i>Limnodynastes dumerilii</i>	Banjo Frog				Burrowing frog, often found well away from freshwater bodies, but requires standing water to breed.
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog				Medium sized frog, found in close proximity to fresh water.
<i>Litoria ewingii</i>	Southern Brown Tree Frog			R	Previously recorded in the Park ¹²
<i>Neobatrachus pictus</i>	Burrowing Frog			R	Burrowing frog, recorded in the dam within the Park. ¹³
<i>Pseudophryne bibronii</i>	Bibron's Toadlet		R	V	Heard in dam on Waitpinga cliffs ¹⁴
Rating codes: R = Rare; V = Vulnerable; E=Endangered; EX = Extinct					

4.4.4 Insects

Newland Head Conservation Park provides extensive and varied remnant butterfly habitat with valuable hostplant patches¹⁵. Butterflies which have been recorded are included in Table 8. The SFCAP lists the pressure of kangaroo grazing in the region as one of the threats to butterfly habitat.

Table 8 Butterfly species known from the Newland Head area

Species	Common Name	Vulnerability	Larval Foodhost
<i>Antipodia altralba</i>	Black and White Skipper	Local	<i>Gahnia ancistrophylla</i> , <i>G. deusta</i> , <i>G. laigera</i>
<i>Hesperilla chrysotricha</i>	Chrysotricha Skipper	Vulnerable	<i>Gahnia deusta</i> , <i>G. filum</i> , <i>G. sieberiana</i> , <i>G. trifida</i>
<i>Theclinesthes albocincta</i>	Grund's Blue	Local	<i>Adriana</i> spp. (including <i>A. quadripartita</i>)

4.5 Aboriginal Heritage

Prior to colonial settlement in 1836, the Newland Head area was inhabited by the **Ngarrindjeri** people and the coastal and inland environments would have provided important seasonal food and other resources. The 2004 Newland Head Conservation Park Management Plan states that there are currently two archaeological sites listed in the Park. However, these recordings do not reflect a comprehensive survey of the area and the Plan recommends that further research is undertaken to identify and record sites of significance in the Park.

⁹ Environment Protection and Biodiversity Conservation Act 1999

¹⁰ Schedules of the National Parks and Wildlife Act 1972 accessed November 2015

¹¹ Gillam, S. and Urban, R. (2014) Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, Adelaide and Mount Lofty Ranges NRM Region. Department of Environment, Water and Natural Resources, South Australia.

¹² www.ala.org.au accessed 4/2/2016

¹³ www.ala.org.au accessed 4/2/2016

¹⁴ Ron Taylor, pers. comm. 2016.

¹⁵ Caton et al, 2007.

5 Threats (management issues)

Biodiversity management issues identified in the SFCAP which are of particular concern in terms of biodiversity conservation in Newland Head Conservation Park and environs include:

- Weed infestation; and
- High kangaroo numbers which threaten revegetation efforts.

Other management issues which are of concern to on-ground managers, including the FNHCP include:

- Grazing and predation by pest animals (i.e. foxes, cats, rabbits, hares, rats, mice);
- Erosion; and
- Recreation activities such as hiking, camping, illegal sandboarding, illegal mountain biking, etc

5.1 Invasive weeds

The diversity and structure of the native vegetation communities at Newland Head Conservation Park are threatened by a range of introduced weed species and the following table lists the weeds of concern which have been recorded in the Park, their threat ratings and whether they have been a target for control in recent years. A full list of weeds recorded is included in Appendix 1.

Table 9: List of Priority Weeds for control in Newland Head Conservation Park

Species	Common Name	Declared ¹	WONS ²	SFCAP Threat Level ³	Red Alert Weed Rating ⁴	Target weed for FNHCP ⁵	Target weed for NR AMLR
<i>*Acacia cyclops</i>	Western Coastal Wattle			7	3	Y	Y
<i>*Acacia longifolia ssp. longifolia</i>	Sallow Wattle			5	3	Y	
<i>*Acacia saligna</i>	Golden Wreath Wattle			5	2	Y	
<i>*Agave americana</i>	Century Plant			3	3	Y	
<i>*Ammophila arenaria</i>	Marram Grass			-	3		
<i>*Arctotheca calendula</i>	Capeweed			1	1	Y	
<i>*Asparagus asparagoides</i>	Bridal Creeper	Y	Y	9	5	Y	
<i>*Asparagus declinatus</i>	Bridal Veil			8	5	Y	
<i>*Asphodelus fistulosus</i>	Onion Weed			1	2	Y	
<i>*Atriplex prostrata</i>	Creeping Saltbush			1	2		
<i>*Avena barbata</i>	Wild Oat			1	2		
<i>*Billardiera heterophylla</i>	Blue-bell Creeper				3	Y	
<i>*Brassica tournefortii</i>	Wild Turnip			3	2	Y	
<i>*Bromus spp.</i>	Brome			1	1		
<i>*Cakile maritima</i>	Tow-horned Sea Rocket			-	2		
<i>*Carduus tenuiflorus</i>	Slender Thistle			1	2	Y	
<i>*Carpobrotus edulis ssp. edulis</i>	Hotentot Fig			4	2	Y	Y
<i>*Cenchrus clandestinum</i>	Kikuyu			2	3		
<i>*Centaurea melitensis</i>	Maltese Cockspur				2		
<i>*Chenopodium album</i>	Fat Hen			1	1		
<i>*Chondrilla juncea</i>	Skeleton Weed	Y		2	2	Y	
<i>*Chrysanthemoides monilifera</i>	Boneseed	Y		6	3	Y	
<i>*Cirsium vulgare</i>	Spear Thistle					Y	
<i>*Conyza albida</i>	Tall Fleabane			1	2		
<i>*Coprosma repens</i>	New Zealand Mirror-bush			4	3		
<i>*Cynodon dactylon</i>	Couch			3	2		

Species	Common Name	Declared ¹	WONS ²	SFCAP Threat Level ³	Red Alert Weed Rating ⁴	Target weed for FNHCP ⁵	Target weed for NR AMLR
<i>*Diplotaxis muralis</i>	Wall Rocket			3	2	Y	
<i>*Disa bracteata</i>				5	3	Y	
<i>*Dittrichia graveolens</i>	Stinkwort				2	Y	
<i>*Echium plantagineum</i>	Salvation Jane			2	2	Y	
<i>*Ehrharta calycina</i>	Perennial Veldt Grass			4	3		Y
<i>*Ehrharta longiflora</i>	Annual Veldt Grass			2	2		
<i>*Ehrharta villosa var. maxima</i>	Pyp Grass			8	4	Y	Y
<i>*Euphorbia paralias</i>	Sea Spurge			5	3		
<i>*Euphorbia terracina</i>	False Caper	Y		5	3	Y	
<i>*Feraria crispa</i>	Black Flag			3	1	Y	
<i>*Foeniculum vulgare</i>	Fennel					Y	
<i>*Gomphocarpus cancellatus</i>	Broad-leaf Cotton-bush			1	2		
<i>*Heliotropium europaeum</i>	Potato Weed					Y	
<i>*Hypochaeris spp.</i>	Cat's Ear			1	1		
<i>*Lagurus ovataus</i>	Hare's Tail Grass			2	2		
<i>*Leptospermum laevigatum</i>	Coastal Tea-tree			6	3	Y	Y
<i>*Limonium companyonis</i>	Sea-lavender			2	2		
<i>*Lolium spp.</i>	Ryegrass			1	1		
<i>*Lupinus cosentinii</i>	Blue Lupine			3	2	Y	
<i>*Lycium ferocissium</i>	African Boxthorn	Y	Y	7	3	Y	
<i>*Malva parviflora</i>	Small-flower Marshmallow			3	1		
<i>*Marrubium vulgare</i>	Horehound	Y		4	3	Y	
<i>*Medicago spp.</i>	Medic			1	2		
<i>*Melilotus indicus</i>	King Island Melilot			1	2		
<i>*Oenothera stricta</i>	Evening Primrose			1	2		
<i>*Olea europaea</i>	Olive	Y		5	4	Y	
<i>*Onopordum acaulon</i>	Stemless Thistle					Y	
<i>*Osteospermum fruticosum</i>	Seascape Daisy			2	-		
<i>*Oxalis pes-caprae</i>	Soursob	Y		5	3		
<i>*Paraserianthes lophantha</i>	Cape Leeuwin Wattle					Y	
<i>*Pinus radiata</i>	Radiata Pine			4	3	Y	
<i>*Plantago spp.</i>	Plantain			3	2		
<i>*Reichardia tingitana</i>	False Sow-thistle			3	2		
<i>*Reseda lutea</i>	Cut-leaf Mignonette					Y	
<i>*Romulea spp.</i>	Onion-grass			1	2		
<i>*Rhamnus alaternus</i>	Buckthorn			6	3		
<i>*Rosa canina</i>	Dog Rose	Y		2	3	Y	
<i>*Salvia verbenaca</i>	Salvia					Y	
<i>*Scabiosa atropurpurea</i>	Scabious			3	2	Y	
<i>*Senecio pterophorus</i>	African Daisy			2	3		
<i>*Solanum linnaeanum</i>	Apple of Sodom			4	3	Y	
<i>*Sonchus spp.</i>	Sow-thistle			1	1		
<i>*Stenotaphrum secundatum</i>	Buffalo Grass			2	2		
<i>*Thinopyron junceiforme</i>	Sea Wheat-grass			1	4	N	
<i>*Trifolium spp.</i>	Clover			1	2		
<i>*Ulex europaeus</i>	Gorse	Y		7	4		
<i>*Ursinia anthemoides</i>	African Marigold					Y	Y
<i>*Verbascum virgatum</i>	Twiggy Mullein			3	2		

Species	Common Name	Declared ¹	WONS ²	SFCAP Threat Level ³	Red Alert Weed Rating ⁴	Target weed for FNHCP ⁵	Target weed for NR AMLR
<p>1 Biosecurity SA Weeds and Pest Animals. Declared plants in South Australia, October 2012</p> <p>2 Australian Weeds Committee (2012), Weeds of National Significance 2012. Department Agriculture, Fisheries and Forestry, ACT</p> <p>3 Southern Fleurieu Coastal Action Plan (SFCAP) Threat Levels: The threat value allocation process undertaken as part of the SFCAP identified a total of 89 priority environmental weeds for the Southern Fleurieu coastal region, each featuring a weed threat value between 1 and 9.</p> <p>4 Red Alert Weed Categories (From Croft, et al (2005 – 2008) Bushland Condition Monitoring Manual. NCS SA Inc):</p> <p>1 – Generally only invade disturbed bushland. Often widespread and abundant but not considered a significant threat to native biodiversity, unless present at very high densities.</p> <p>2 - Generally only invade disturbed bushland, but may spread rapidly. However, generally only a slight potential to reduce native species diversity, unless present at very high densities.</p> <p>3 – Invasive in intact bushland with moderate potential to reduce native species diversity. Rate of spread is slower than Category 4 and 5 weeds but once present will persist and threaten biodiversity. May produce dense stands over a wide area but can be controlled with sustained effort.</p> <p>4 – Highly invasive in either disturbed or intact remnant bushland, with the potential to spread rapidly and produce very dense stands given favourable habitat and/or vectors. High potential to reduce native species diversity and abundance. Can be controlled with sustained effort.</p> <p>5 – Highly invasive in either disturbed or intact bushland, spreads rapidly producing very dense stands and a blanket cover. Potential to eliminate almost all native understorey species. Very difficult to control without outside help.</p> <p>5 Taylor, 2013. Integrated weed management plan, Friends of Newland Head Conservation Park, December 2013.</p>							

5.2 Pest animals

The following table lists the introduced animal species which have been recorded at Newland Head Conservation Park.

Table 10: List of introduced animal species recorded at Newland Head

Species	Common Name
Mammals	
<i>Felis catus</i>	Feral Cat
<i>Lepus capensis</i>	Brown Hare
<i>Mus musculus</i>	House Mouse
<i>Oryctolagus curiculus</i>	European Rabbit
<i>Rattus rattus</i>	Black Rat
<i>Vulpes vulpes</i>	Fox
Birds	
<i>Alauda arvensis</i>	Skylark
<i>Columba livia</i>	Common Rock Dove
<i>Carduelis carduelis</i>	European Goldfinch
<i>Passer domesticus</i>	House Sparrow
<i>Sturnus vulgaris</i>	Common Starling
<i>Turdus merula</i>	Blackbird

Of these introduced animals fox, rabbit and cat populations are considered to be a significant threat to the Park's biodiversity and are a high priority in terms of active management strategies¹⁶.

¹⁶ DEH, 2004.

5.3 Kangaroos

Western Grey Kangaroo (*Macropus fuliginosus*) numbers within Newland Head Conservation Park and surrounding areas are generally considered to be high and of concern¹⁷. Kangaroo surveys have been conducted in the past and results generally indicate that densities are consistently higher than 25 individuals per square kilometre¹⁸. Control options such as sterilisation and relocation are not considered to be feasible and culling is probably the most practical and humane method¹⁹.

5.4 Fire

The Australian environment has evolved in the presence of fire for thousands of years. However, wildfires can have a negative impact on native flora and fauna, depending on the degree of intensity and/or frequency. Some plant species may not recover well after fire, while other more fire-tolerant species may thrive and become abundant. Fauna species which have a limited distribution or are already at risk due to low numbers may also be negatively impacted.

Recent fires at Newland Head Conservation Park include a wildfire in the spring of 2009 which burnt approximately 6.6ha and a deliberately lit fire in summer 2011 which burnt approximately 150ha at the eastern end of the Park (see Figure 3 for locations). No prescribed burns are currently planned for the Park²⁰.

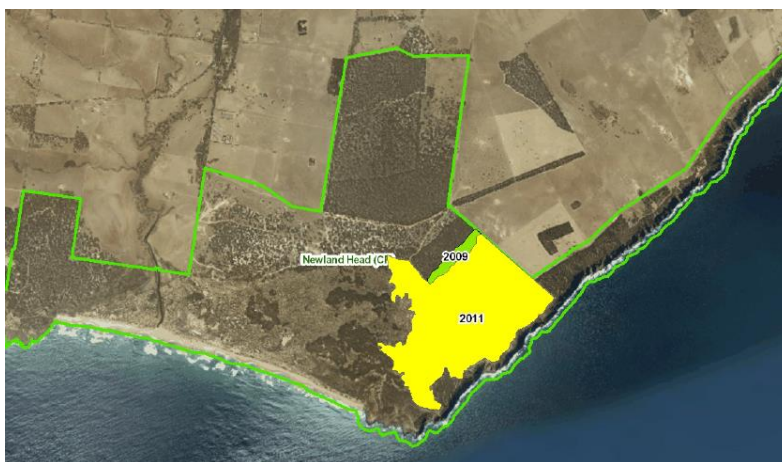


Figure 3: Newland Head CP fire history (last 10 years). Source: NatureMaps

5.5 Recreation activities

Newland Head Conservation Park is a popular destination with over 100,000 visitors per year²¹. Recreation activities within the Park include:

- surfing at both Waitpinga Beach (which hosts surf competitions) and Parsons Beach;
- beach and estuary fishing;
- hiking – the park contains one of the most spectacular sections of the Heysen Trail;
- camping; and
- whale watching

¹⁷ Seiji Iwao, pers. comm. 2015.

¹⁸ DEH, 2004.

¹⁹ DEH, 2004.

²⁰ Seiji Iwao, pers. comm. 2015.

²¹ DEH, 2004.

Other recreation activities which occur, but which are not permitted, within the park include sand-boarding down the dunes which front Waitpinga Beach and Parsons Beach, mountain biking which occurs along the Waitpinga cliffs section of the Heysen Trail, hunting, campfires, off-track walking, littering and bringing pets and other animals into the park.

Park visitors may have a negative impact on biodiversity by:

- trampling or crushing vegetation when walking through sensitive, intact areas such as dunes;
- compacting soil which limits natural regeneration;
- disturbance of soil/erosion which encourages weeds;
- introduction of weed seed on shoes and car tyres;
- disturbance to sensitive fauna species such as the beach-nesting Hooded Plover;
- predation on native animals by domestic pets such as cats and dogs (which are not permitted in conservation parks); and
- inadvertently lighting fires, as happened in 2011 when 150ha of the park was burnt.

5.6 Erosion

Erosion is evident on the dunes which back Waitpinga Beach and Parsons Beach, probably due in part to natural coastal processes such as storm damage and fire but also caused by recreation activities such as sand-boarding and the establishment of car parks, boardwalks and associated infrastructure. Runoff from the roadway and carparks has also caused some gully erosion.

There is also evidence of erosion on parts of the Heysen Trail, caused by trampling and compaction, as well as hikers wandering off the designated pathway and into adjacent sensitive cliff-top vegetation to gain a better view of the coastline.

It is recommended that, to prevent further erosion and associated vegetation loss, DEWNR staff continue to monitor eroded sites and implement prevention measures and rehabilitation programs, as necessary.

6. Biodiversity management strategies

6.1 Biodiversity management objectives

The biodiversity management objectives for Newland Head Conservation Park are to manage the native vegetation of the reserve in such a manner as to:

- Prevent any further loss of biodiversity; and
- Strengthen the long term viability of the existing biodiversity assets.

In order to monitor whether these objectives are being met, the Bushland Rapid Assessment Technique (BushRAT) was used as part of this project to provide a benchmark against which to assess change over time. This methodology, which has been developed by the Native Vegetation Management Unit (SA Dept Environment, Water & Natural Resources), gathers data on bushland condition within a defined 2 hectare area. The BushRAT monitoring data collected as part of this project is summarised in Appendix 3.

6.2 Management units

To facilitate the ongoing management of threats to biodiversity at Newland Head Conservation Park (most notably weed and pest animal control), the park has been divided into management units. Delineation of management units or zones is based largely on the type of vegetation present and the condition of the vegetation, as well as tracks and topography. The management units are described in the following table and shown in Figure 4. Specific management actions within each management unit are outlined in Section 8 'Biodiversity Action Plan'.

Table 11. Newland Head Conservation Park Management Units

Management Unit	Description
1	Parsons Beach dunes and foredunes.
2	Waitpinga Beach dunes and foredunes
3	Parsons Beach clifftop
4	Back dunes
5	Parsons Beach Low Forest/Mallee
6	Parsons Beach Woodland
7	Waitpinga Creek estuary (not BushRat'ed as part of this project as previously assessed ²²)
8	Intact scrub areas of Sections 1381, 399 & 400
9	Intact scrub areas of Sections 1380 (includes burnt areas) and extending along the Waitpinga cliffs
10	Dune shrubland and coastal mallee patches in Sn 1380
11	Intact areas of scrub north of the track in Section 1380
12	Patchy Mallee areas in Section 1380
13	"Rehabilitation" area of Section 1380
14	Newland Head and Waitpinga Cliff faces and clifftops
15	Lot 22 Revegetation block, fenced revegetation block NE corner of Sn 1381 and 'Firetail Haven'
16	Built-up areas – campground, carpark etc (not BushRat'ed as part of this project)

²² EAC – Ecological Evaluation, 2014. *Resource condition assessment. Southern Fleurieu estuaries*, prepared for Adelaide and Mount Lofty Ranges Natural Resources Management Board

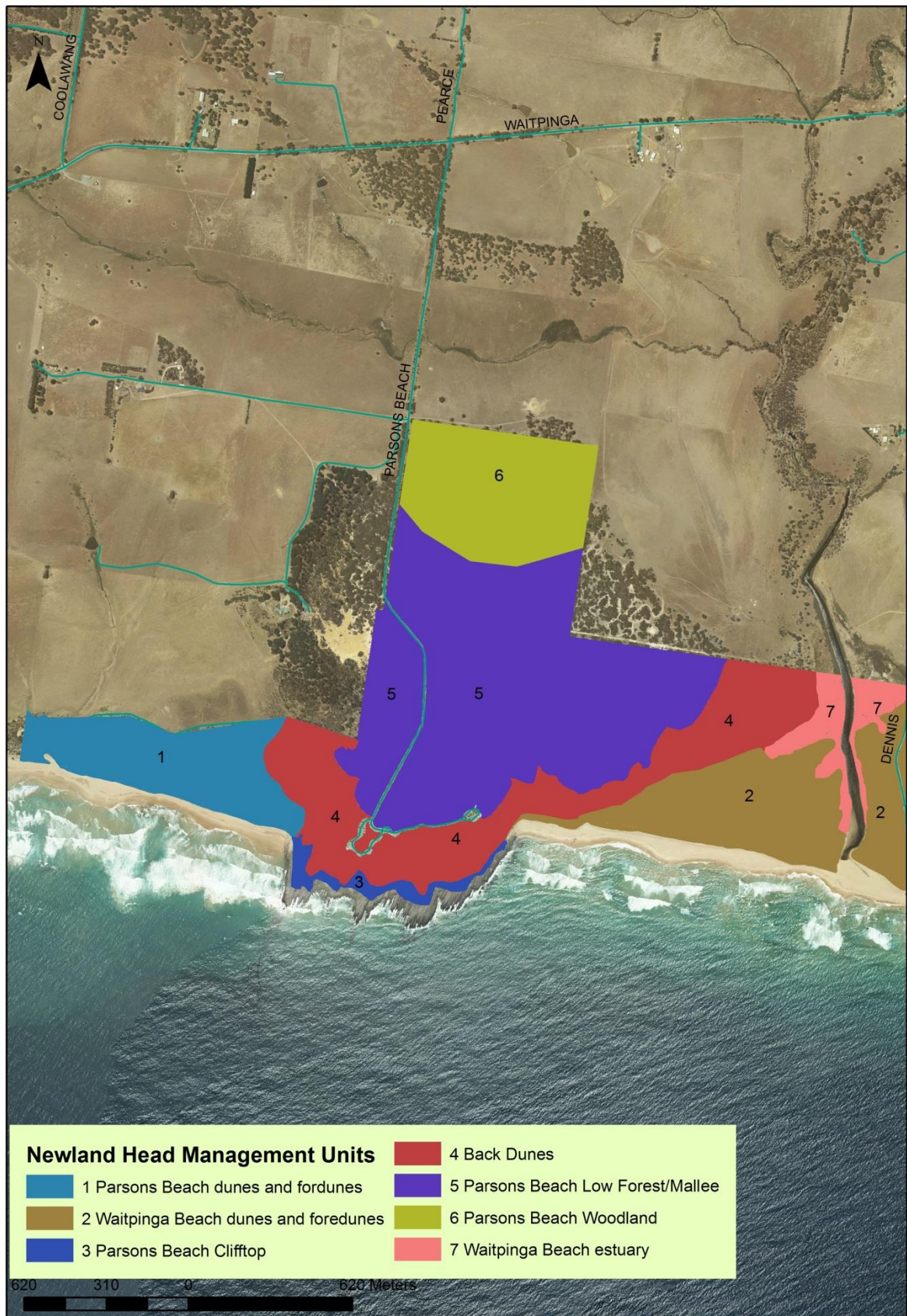


Figure 4-1: Newland Head Conservation Park management units

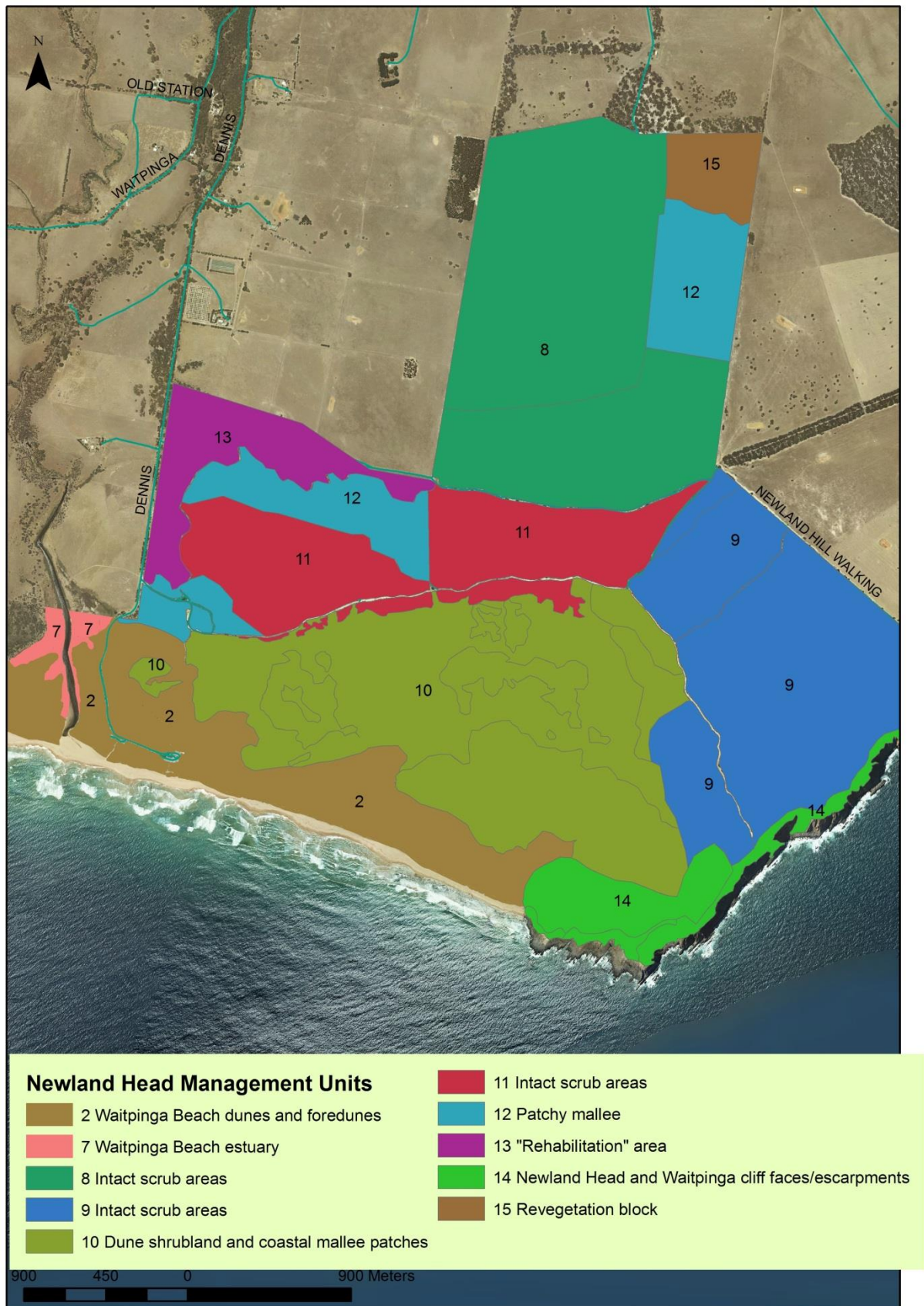


Figure 4-2: Newland Head Conservation Park management units



Figure 4-3: Newland Head Conservation Park management units

6.3 Managing weeds

Weed management is a key priority to help retain the biodiversity values in Newland Head. While many introduced plants are only a problem in disturbed parts of the Park or remain in open country with a history of grazing, the following weeds are of concern, and a high priority for control, as they are actively invading intact native vegetation and displacing or choking out native plant species:

- ***Acacia cyclops* (Western Coastal Wattle)** – past occurrences in the Parsons Beach dunes have largely been removed, however vigilance required.
- ***Acacia saligna* (Golden Wreath Wattle)** – scattered individuals occur in the northeastern section of the Park. It has the capacity to outcompete and suppress local species by shading out and creating clusters due to suckering.
- ***Agave americana* (Century Plant)** – highly invasive in sandy dune areas, such as the rear dune area of Parsons Beach.
- ***Asparagus asparagoides* (Bridal Creeper) and *Asparagus declinatus* (Bridal Veil)** – have become widely established within the park in the last 20 years. Substantial effort has been made to control these species, including aerial spraying with biological control agents (rust and leaf hoppers), spot spraying with herbicide and hand-digging of seedlings.
- ***Chrysanthemoides monilifera* (Boneseed)** – this species invades the shrub layer of coastal vegetation. It displaces other shrubs and suppresses the growth of grasses and other native ground-layer plants. It provides poor habitat for native fauna and reduces biodiversity.
- ***Disa bracteata* (Monadenia)** – of particular concern along the Waitpinga Cliffs where it has the potential to impact on rare and endangered plants in the understorey.
- ***Ehrharta calycina* (Perennial Veldt Grass)** - This perennial grassy weed thrives in sandy habitats and is particularly prolific in disturbed areas of Newland Head. It has been targeted for control in the revegetation area known as “Firetail Haven” (Management Unit 15)
- ***Ehrharta villosa* (Pyp Grass)** – has been targeted for control in the Parsons Beach dunes
- ***Feraria crispa* (Black Flag)** - has been targeted for control in the Parsons Beach dunes
- ***Leptospermum laevigatum* (Coast Tea-tree)** - has been targeted for control in the Parsons Beach dunes
- ***Lycium ferocissimum* (African Boxthorn)** – this weed is targeted when seen at Newland Head, however vigilance is required to ensure that it does not become established as it can form dense thickets and act as a protective barrier for feral pests such as rabbits and foxes.
- ***Olea europaea* (Olive)** – Only one mature individual was noted in Management Unit 1, however ongoing vigilance is a high priority
- ***Paraserianthes lophantha* (Cape Leeuwin Wattle)** – has been targeted for control in Management Unit 9 and is monitored and removed when seen
- ***Ursinia anthemoides*** - has been targeted for control in and around the central quarry area (Management Units 11 and 12)

Recommended actions to control these and other weeds which are also a high priority for control over the next 5 years are included in the Biodiversity Action Plan table in Section 8.

It is also recommended that on-going monitoring for, and mapping of, new weed infestations should also be undertaken as part of the weed control program.

6.4 Managing pest animals

At present rabbits are controlled annually with a baiting program throughout the Park. It is recommended that warren fumigation is incorporated into this annual program to reduce grazing pressure.

Cats are trapped as they are observed and this should continue as a high priority to protect threatened fauna species such as Hooded Plovers and Crested Terns.

Fox control is not undertaken within the park boundary, however owners of neighbouring properties are actively encouraged to undertake fox control²³. Implementation of a fox control program within the Park is seen as a high priority, particularly because of the habitat that the Park provides for species such as the State Vulnerable Hooded Plover which nests on the ground and is at risk of predation by foxes and cats.

6.5 Managing kangaroos

Parts of the Mount Lofty Ranges have reduced regeneration as a result of grazing pressure from kangaroos²⁴. Failure to manage kangaroo grazing pressure at Newland Head Conservation Park is likely to result in reduced survivorship and recruitment of native vegetation, leading to altered vegetation composition and structure, increased invasion by weed species and reduced success from revegetation efforts, as well as sand dune disturbance and subsequent erosion.

It is therefore recommended that:

- kangaroo counts/monitoring are continued to ascertain whether the population is beyond sustainable levels; and
- neighbouring landholders are encouraged to control kangaroo numbers on their properties.

Given the broad scale regional issue of kangaroo management, this is flagged as a potential area for future research, with Newland Head Conservation Park a key site given its significant biodiversity values. Partnerships between DEWNR and research organisations should be instigated to promote and undertake this research. Key research questions include practical methods to accurately inventory/monitor kangaroo numbers, impacts of kangaroos as they relate to kangaroo density, and viable long term mechanisms for control in National Parks.

6.6 Managing use conflicts – people and recreation

Management actions should be aimed at reducing the conflicts between the needs of people and biodiversity within the Park. One of the objectives stated in the 2004 Management Plan (DEH) was to “Provide appropriate infrastructure to enhance visitor experience while conserving the natural values of the park.”

Day visitor facilities are provided at Waitpinga and Parsons Headlands and include toilets, beach showers, boardwalks, fencing, information shelters and signs. The Waitpinga Campground also offers day visitor facilities which include a barbecue, shelter and toilet.

²³ Seiji Iwao (Ranger), pers. comm., 2015.

²⁴ AMLRNM 2014

Interpretive and regulatory signage exists at strategic points such as the Waitpinga and Parsons Beach car parks. It is recommended that, to inform visitors about the biodiversity and cultural values of the Park, additional signage should be installed at park access points, in particular in areas which are sensitive to foot traffic, soil compaction and erosion such as along the Waitpinga Cliffs section of the Heysen Trail.

Newland Head Conservation Park provides a network of walking trails and beach access paths for visitor use. Signs have been erected to encourage visitors to respect revegetation and to avoid walking on dunes and other erosion-prone areas by using the clearly designated walking trails. One of the objectives of the 2004 Management Plan (DEH) was to “Provide and maintain a high quality walking trail system that enhances visitor experience without compromising the park’s natural values.” It is recommended that ongoing maintenance of existing trails continues as a priority.

If any new trails are proposed for the Park in the future, they will need to be “sited and developed to protect native vegetation and other park values” (DEH, 2004). Areas of vegetation in good condition, or fragile areas (such as dunes) should be avoided where possible.

6.7 Managing for threatened fauna species

Newland Head Conservation Park provides habitat for up to 5 nationally and 43 State threatened fauna species (excluding marine mammals). Approximately 52 bird species of regional conservation significance have been recorded.

The regional recovery planning process undertaken by Wilson and Bignall (2009) identified that the most significant direct threats to threatened flora and fauna species in the Mount Lofty Ranges include climate change, drought and severe weather, weed invasion, grazing and disturbance by stock, water management and use, residential and commercial development, predation and inappropriate fire regimes. Whilst some of these threats operate at scales that cannot be addressed by this biodiversity action plan, others, such as weed invasion, grazing and predation are priorities and have been addressed in the biodiversity action plan (Section 8). Managing these threats to benefit a broad suite of species, including threatened species, is the central tenet of the current plan.

Species which occur in the Park for which specific management actions (outside those addressed above) are recommended are detailed below.

Hooded Plover

Hooded Plovers nest on beaches between the high water mark and the dunes and are therefore vulnerable to the impacts of people and predators such as dogs and foxes. It is estimated that there are 50-70 Hooded Plovers remaining on the Fleurieu coastline, including a nesting pair on Waitpinga Beach and on Parsons Beach. Recommended management actions to alleviate threats to Hooded Plovers in Newland Head Conservation Park include the following:

- Continue to protect breeding sites by restricting access to parts of beaches (i.e. temporary fencing);
- Investigate and, if appropriate, implement a control program for foxes near Hooded Plover breeding sites;
- Enforce the no dogs on beach rule in Newland Head Conservation Park;

- Maintain/improve current levels of community awareness and involvement (i.e. community monitoring of nests); and
- Implement other relevant actions as outlined in the Hooded Plover Recovery Plan²⁵.

White Bellied Sea Eagle

White-bellied Sea-eagles nest along cliffs, rock pinnacles, escarpments or in tall trees. Threats to their long-term viability include predation by foxes, feral cats and dogs and loss of habitat. They are also sensitive to nest disturbance during the breeding season.

The working protocol for protection of the nesting pair of White-bellied Sea-Eagle which occur in Newland Head Conservation Park which that:

- “A no go policy will be observed during the critical non-disturbance period from mid-June to end of November within a 1 kilometre radius of the White-bellied Sea-Eagle nest. However, this period may be extended or reduced by the DEWNR depending on the timing of breeding events from year to year.”²⁶

6.8 Revegetation

The FNHCP has undertaken extensive revegetation projects throughout a number of areas in the Park over the last 20 years, focussing largely on degraded areas of past clearance (Management Unit 15 – “Revegetation Blocks”). Much time and effort has gone into maintaining these plantings, including rabbit and kangaroo proof fencing/tree guarding, supplementary watering and weeding. The FNHCP has also undertaken planting of *Gahnia trifida*, in conjunction with weed management, in estuarine areas with the aim of improving butterfly habitat.

It is recommended that future revegetation efforts at Newland Head Conservation Park should focus upon supplementing existing habitat, buffering existing remnants and undertaking infill planting using appropriate species for the vegetation community and planting at appropriate (natural) densities. Any revegetation planning will need to consider the excessive grazing pressure by kangaroos and undertake measures to protect revegetation such as tree guarding, fencing, etc.

Priority areas for revegetation are:

- Management Unit 12 “Patchy Mallee”
- Management Unit 13 “Rehabilitation Area”
- Management Unit 15 “Revegetation Blocks”

A revegetation plant list has been provided as a guide (Appendix 4).

²⁵ Baker-Gabb, D. and Weston, M., August 2006. *South Australian Recovery Plan for the Hooded Plover *Thinornis rubricollis** (Draft).

²⁶ Seiji Iwao, email dated 11th May, 2016.

7. Monitoring

7.1 Bushland Rapid Assessment Technique (BushRAT)

As part of this project, the Bushland Rapid Assessment Technique (BushRAT) was used as a method to monitor the progress and success of management actions over time. BushRAT's were undertaken within each vegetation community at Newland Head and the results are included in Appendix 3.

BushRAT assessments are useful as they are rapid and can be easily repeated over time to indicate changes in native plant species diversity, weed cover, regeneration, grazing pressure, etc. Use of the protocol not only provides managers with a way to show the positive impact they might be having on their bushland's condition but it also raises their awareness of the vital natural processes going on in the bush and how to detect the early warning signs of threatening processes. Data from individual monitoring sites can also be collated on a regional basis with NVC data to provide better information on the condition and trends in native vegetation.

The BushRAT data has been used to set relevant milestones and targets in the Action Plan which is included in Section 8. It is recommended that the BushRATs undertaken in 2015/2016 be repeated at Newland Head every five years to monitor the progress and success of management actions.

7.2 Photopoints

Simple, repeatable photo points could be used as a low cost alternative to demonstrate changes over time. Photopoints have been established as part of the BushRAT and the GPS coordinates are included in Table 13 and shown in Figure 5. Appendix 5 provides further information on photopoint monitoring.

Table 13. Photopoint locations established at Newland Head 2015-2016.

BushRAT Site	Easting	Northing
1	271172	6054048
2	271401	6053803
3	271465	6053853
4	271823	6054408
5	271793	6055134
6	279212	6056624
6a	279227	6056642
7	279370	6056766
8	279811	6057085
9	277114	6054633
10	276109	6056632
11	274902	6056105
12	274309	6054897
2	271200	6053974
13	275204	6053195
14	275409	6053211
15	275415	6053471
16	274804	6054501
17	273976	6055237

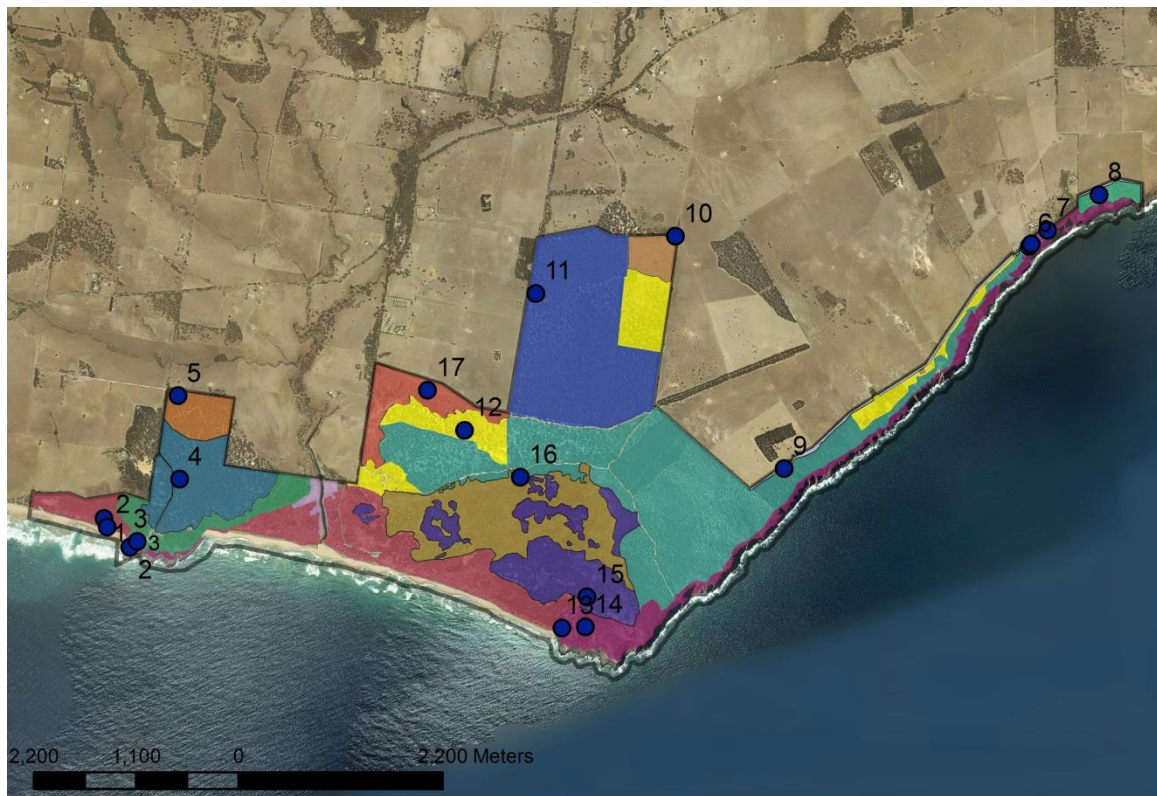


Figure 5: Newland Head Conservation Park BushRAT Photopoint locations

7.3 Plan implementation

Progress reporting helps with the assessment of the effort put in to management actions. Some efforts will be more successful than others. Various factors such as weather or control technique may affect outcomes. Example Works Record sheets are included in Appendix 6.

8 BIODIVERSITY ACTION PLAN

The table below lists the biodiversity management threats/issues for Newland Head Conservation Park, their related objectives, actions already taken to address them, and further actions being proposed. Note that weeds which have been targeted for control over the next 5 years are based on the priorities as described in the Integrated Weed Management Plan for Newland Head, as well as high threat weeds recorded as part of this project.

Acknowledge Ngarandjeri – Damian to supply words

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
WEEDS				
Management Unit 1 (Parsons Beach Dunes and Foredunes)				
<i>Acacia cyclops</i>	Eradicate	On-going control by FNHCP. Targeted by NR AMLR program.	<ul style="list-style-type: none"> Hand-pull smaller plants Cut and swab Monitor for new seedlings 	VH
<i>Agave americana</i>	Eradicate	On-going control by FNHCP	<ul style="list-style-type: none"> Chop out the centre growth and apply herbicide mixed with oil or penetrant 	H
<i>Asparagus asparagoides</i>	Reduce infestations to <1%	FNHCP & contractors – release of leaf hopper and rust fungus (2000)	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. Further release of biocontrols in moderate to densely infested areas 	H
<i>Carpobrotus edulis</i>	Eradicate	FNHCP & Contractors – removed when seen. Targeted by NR AMLR program.	On-going monitoring for new plants	VH

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
<i>Ehrharta villosa</i>	Eradicate	Targeted in NR AMLR program	Continue eradication program	VH
<i>Feraria crispa</i>	Eradicate	Targeted in NR AMLR program	Continue eradication program	VH
<i>Leptospermum laevigatum</i>	Eradicate	Targeted in NR AMLR program	Continue eradication program	VH
<i>Olea europaea</i>	Eradicate one very large individual at E271255/ N6054052	-	<ul style="list-style-type: none"> • Drill and fill mature individuals. Leave mature dead trees standing for habitat. • Hand-pull seedlings. • Patrol & control emergent seedlings as required 	VH
Management Unit 2 (Waitpinga Beach dunes and foredunes)				
<i>Acacia cyclops</i>	Eradicate	Targeted in NR AMLR program – largely controlled	Monitor for new outbreaks and remove when seen	VH
<i>Asparagus asparagoides</i>	Reduce infestations to <1%	FNHCP & Contractors – release of leaf hopper and rust fungus (2000) - helicopter spray of spore water (2009)	<ul style="list-style-type: none"> • Hand-pull, bag and remove young individuals • In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub • Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	H
<i>Asphodelus fistulosus</i>	Control along track edges	FNHCP	<ul style="list-style-type: none"> • Spray in autumn and/or spring • Remove all seed heads to reduce seedbank buildup 	M

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
			<ul style="list-style-type: none"> Ongoing – likely to continually emerge along disturbed edges 	
<i>Carpobrotus edulis</i>	Eradicate	Targeted in NR AMLR program	Monitor for new outbreaks and remove when seen	VH
Management Unit 3 (Parsons Beach Clifftop)				
<i>Asparagus asparagoides</i>	Eradicate	FNHCP & Contractors – release of leaf hopper and rust fungus (2000)	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. Further release of biocontrols in moderate to densely infested areas 	H
<i>Leptospermum laevigatum</i>	Eradicate – several young plants at E271417/ N6053883	Targeted in NR AMLR program	<ul style="list-style-type: none"> Hand-pull seedlings Drill and fill larger individuals Leave mature dead trees standing for habitat Patrol & control emergent seedlings as required 	VH
Management Unit 4 (Back Dunes)				
<i>Acacia anceps</i>	Eradicate	Control by FNHCP	<ul style="list-style-type: none"> Hand-pull smaller plants Cut and swab Monitor for new seedlings 	H
<i>Asparagus asparagoides</i>	Eradicate	FNHCP & Contractors – release of leaf hopper and rust fungus (2000)	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. Further release of biocontrols in moderate to densely infested areas 	H
<i>Carpobrotus edulis</i>	Eradicate	Targeted in NR AMLR program	<ul style="list-style-type: none"> Monitor for new outbreaks and remove when seen 	VH
<i>Chrysanthemoides monilifera</i>	Eradicate	-	<ul style="list-style-type: none"> Hand-pull seedlings 	H

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
			<ul style="list-style-type: none"> Spray or cut and swab larger plants 	
<i>Ehrharta villosa</i>	Eradicate	Targeted in NR AMLR program	<ul style="list-style-type: none"> Continue eradication program 	VH
<i>Leptospermum laevigatum</i>	Eradicate	Targeted in NR AMLR program	<ul style="list-style-type: none"> Hand-pull seedlings Drill and fill larger individuals Leave mature dead trees standing for habitat Patrol & control emergent seedlings as required 	VH
Management Unit 5 (Parsons Beach Low Forest/Mallee)				
<i>Asparagus asparagoides</i>	Reduce infestations to <1%	FNHCP & Contractors – release of leaf hopper and rust fungus (2000) - helicopter spray of spore water (2009)	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	H
<i>Carpobrotus edulis</i>	Eradicate	Targeted in NR AMLR program	Monitor for new outbreaks and remove when seen	VH
<i>Ehrharta villosa</i>	Eradicate	Targeted in NR AMLR program	Continue eradication program	VH
<i>Leptospermum laevigatum</i>	Eradicate	Targeted in NR AMLR program	<ul style="list-style-type: none"> Hand-pull seedlings Drill and fill larger individuals Leave mature dead trees standing for habitat Patrol & control emergent seedlings as required 	VH
Management Unit 6 (Parsons Beach Woodland)				
<i>Asparagus asparagoides</i>	Reduce infestations to <5%	FNHCP & Contractors – release of leaf hopper and rust fungus (2000)	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub 	H

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
			<ul style="list-style-type: none"> Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage Further release of biocontrols in heavily and moderately infested areas 	
<i>Pentameris pallida</i>	Reduce cover to <1%	-	Spot spray, treating outliers in good bushland first	M
<i>Ursinia anthemoides</i>	Eradicate	Targeted in NR AMLR program	Continue eradication program	VH
Management Unit 7 (Waitpinga Creek estuary)				
<i>Asparagus asparagoides</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. Further release of biocontrols in heavily and moderately infested areas. 	H
<i>Gladiolus tristis</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-dig bulbs/corms when soil is moist. Bag and dispose of all material off site. Spot spray or wick wipe before new corms develop and flowering occurs in late winter-early spring. 	M
<i>Sparaxis</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-dig bulbs/corms when soil is moist. Bag and dispose of all material off site. Spot spray or wick wipe before new corms develop and flowering occurs in late winter-early spring. 	M
Management Unit 8 (Intact scrub areas of Sections 1381, 399 & 400)				
<i>Arctotheca calendula</i>	Maintain cover at <1%	FNHCP	<ul style="list-style-type: none"> Spray rosette at an early stage (two treatments may be necessary) 	M

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
<i>Asparagus asparagoides</i>	Reduce infestations to <1%	FNHCP & Contractors	<ul style="list-style-type: none"> Create a weed front along western boundary track, working out from areas of good bushland towards the track (westwards) Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	H
<i>Disa bracteata</i>	Maintain cover at <1%	FNHCP	<ul style="list-style-type: none"> Create a weed front along western boundary track, working out from areas of good bushland towards the track (westwards) Dig out when soil is moist and before seeds develop. Bag and remove material from the site. 	H
<i>Ehrharta calycina</i>	Maintain cover at <1%	-	<ul style="list-style-type: none"> Create a weed front along western boundary track and along the eastern side of the management unit Slash and follow-up spray using glyphosate in areas where there is no potential for off-target damage and fusillade where there is. Where the veldt grass is small it should be sprayed (no slashing required). 	M
Management Unit 9 (Intact scrub areas of Sections 1380 (includes burnt areas and extending along the Waitpinga cliffs))				
<i>Acacia saligna</i> <i>A. baileyana</i>	Eradicate	Control by FNHCP	<ul style="list-style-type: none"> Hand-pull smaller plants Cut and swab Monitor biannually for new seedlings 	VH
<i>Asparagus asparagoides</i> <i>A. declinatus</i>	Reduce infestations to <1%	FNHCP & Contractors	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	H
<i>Paraserianthes lophantha</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-pull or dig out smaller individuals Cut & swab or drill & fill larger individuals, taking care to remove seed pods from the site. 	M

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
Management Unit 10 Dune shrubland and coastal mallee patches in Sn 1380)				
<i>Acacia saligna</i>	Eradicate	Control by FNHCP	<ul style="list-style-type: none"> Hand-pull smaller plants Cut and swab Monitor biannually for new seedlings 	VH
<i>Asparagus asparagoides</i>	Reduce infestations to <1%	FNHCP & Contractors – release of leaf hopper and rust fungus (2000) - helicopter spray of spore water (2009 & 2011)	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	H
<i>Asparagus declinatus</i>	Eradicate	FNHCP & Contractor (2007)	<ul style="list-style-type: none"> Hand grub small individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub 	VH
<i>Galenia pubescens</i>	Maintain cover at <1%	-	<ul style="list-style-type: none"> Hand-pull, spray, cut and swab. Bag and remove from site if seed is present. 	M
Management Unit 11 (Intact areas of scrub north of the track in Section 1380)				
<i>Acacia saligna</i> <i>A. baileyana</i>	Eradicate	Control by FNHCP	<ul style="list-style-type: none"> Hand-pull smaller plants Cut & swab or drill & fill larger individuals taking care to remove seed pods from site Monitor for new seedlings 	H
<i>Ursinia anthemoides</i>	Eradicate	Targeted in NR AMLR program	Continue eradication program	VH
Management Unit 12 (Patchy mallee areas in Section 1380)				
<i>Asparagus asparagoides</i>	Reduce infestations to <1%	FNHCP & Contractors	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	H

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
<i>Asparagus declinatus</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand grub small individuals Spot spray larger infestations 	VH
<i>Disa bracteata</i>	Maintain cover at <1%	FNHCP	<ul style="list-style-type: none"> Dig out when soil is moist and before seed develop. Bag and remove material from the site. 	H
<i>Ehrharta calycina</i>	Reduce cover to <1%	Targeted in NR AMLR program	<ul style="list-style-type: none"> Slash and follow-up spray using glyphosate in areas where there is no potential for off-target damage and fusillade where there is. Where the veldt grass is small it should be sprayed (no slashing required). 	H
<i>Ursinia anthemoides</i>	Eradicate	Targeted in NRM program	Continue eradication program	VH
Management Unit 13 (“Rehabilitation” area of Section 1380)				
<i>Arctotheca calendula</i>	Reduce cover to <1%	Ongoing control by FNHCP	<ul style="list-style-type: none"> Spray rosette at an early stage (two treatments may be necessary) 	M
<i>Asparagus asparagoides</i>	Reduce infestations to <1% cover	FNHCP & Contractors	<ul style="list-style-type: none"> Hand-pull, bag and remove young individuals In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. Further release of biocontrols 	M
<i>Disa bracteata</i>	Maintain cover at <1%	FNHCP	<ul style="list-style-type: none"> Dig out when soil is moist and before seed develop. Bag and remove material from the site. 	H
<i>Ehrharta calycina</i>	Reduce cover to <25%	-	<ul style="list-style-type: none"> Slash and follow-up spray using glyphosate in areas where there is no potential for off-target damage and fusillade where there is. Where the veldt grass is small it should be sprayed (no slashing required). 	M
<i>Onopordon acaulon</i>	Eradicate	FNHCP – in and around quarry area	<ul style="list-style-type: none"> Grub isolated plants when soil is moist, removing as much of the tap root as possible Spot spray 	H

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
<i>Ursinia anthemoides</i>	Eradicate	Targeted in NRM program	Continue eradication program	VH
Management Unit 14 (Newland Head and Waitpinga Cliff faces, include BushRAT Community 7)				
<i>Asparagus asparagoides</i> <i>A. declinatus</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Remove young plants by digging – bag and remove material from site In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	VH
<i>Disa bracteata</i>	Maintain cover at <1%	FNHCP	<ul style="list-style-type: none"> Dig out when soil is moist and before seed develop. Bag and remove material from the site. likely to continually emerge 	VH
<i>Chrysanthemoides monilifera</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-pull seedlings Spray or cut and swab larger plants 	M
Management Unit 15 (Lot 22 Revegetation block, fenced revegetation block NE corner of Sn 1381 and ‘Firetail Haven’)				
<i>Acacia longifolia</i> <i>var. longifolia</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-pull smaller plants Cut & swab or drill & fill larger individuals taking care to remove seed pods from site Monitor for new seedlings 	H
<i>Arctotheca calendula</i>	Maintain at cover of <1%	Ongoing control by FNHCP	<ul style="list-style-type: none"> Spray or swab rosette at an early stage (two treatments may be necessary) 	M
<i>Asparagus asparagoides</i> <i>A. declinatus</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Remove young plants by digging – bag and remove material from site In areas clear of native vegetation – spray with Glyphosate 360g/L and Pulse or grub Where Bridal Creeper is growing on/through native vegetation –pull individuals off native plants, cut leafy material back, carefully wipe (Glyphosate 360g/L and Pulse) and place/pin in a location where there will be no off-target damage. 	VH
<i>Chondrilla juncea</i>	Eradicate	FNHCP	<ul style="list-style-type: none"> Hand-pull seedlings and small plants when soil is moist Cut & swab larger plants 	M

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
<i>Disa bracteata</i>	Maintain cover at <1%	FNHCP	<ul style="list-style-type: none"> Dig out when soil is moist and before seed develop. Bag and remove material from the site. 	VH
<i>Ehrharta calycina</i>	Reduce infestations to <1%	Targeted in NR AMLR program (“Firetail Haven” revegetation area)	<ul style="list-style-type: none"> Slash and follow-up spray using glyphosate in areas where there is no potential for off-target damage and fusillade where there is. Where the veldt grass is small it should be sprayed (no slashing required). 	H
<i>Phalaris sp.</i>	Maintain cover of <1%	FNHCP	<ul style="list-style-type: none"> Slash during spring/summer before flowering to reduce seed production Spray less dense infestations during winter-spring (when plants are growing vigorously) using a non-selective or grass-selective herbicide 	M
All Management Units				
New weed incursions	No new weeds in Newland Head Conservation Park.	Ongoing vigilance by DEWNR staff, FNHCP for any new weed incursions.	<ul style="list-style-type: none"> Continue vigilance by Parks staff and FNHCP volunteers for any new weed incursions into the Park. 	H
PEST ANIMALS				
Foxes	Implement a fox control program	-	<ul style="list-style-type: none"> Shoot outside the Park when foxes are observed Map fox dens (both inside and outside Park boundaries) and fumigate as required Undertake a baiting program (both inside and outside the Park boundaries) twice per year - late summer/early autumn and late winter/early spring Encourage neighbouring landholders to undertake control on private land 	H
Feral Cats	No feral cats	Cats are trapped when detected (DEWNR staff)	Continue trapping, as necessary	H
Rabbits	No rabbits	Annual baiting by DEWNR and FNHCP	Continue annual or biannual baiting. Implement a fumigation program (in conjunction with baiting)	H
KANGAROOS – Negative impacts on biodiversity (reduced survivorship and recruitment of native vegetation, spread of weed species, trampling, erosion)				
	Kangaroo numbers are not negatively impacting on management activities (eg revegetation).	Kangaroo counts have been undertaken previously	DEWNR staff anecdotally monitor kangaroo numbers and impacts on native vegetation and revegetation. If numbers are considered to be excessive, hold discussions with NRAMLRL regarding control options.	M

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
RECREATION – Negative impacts on biodiversity (trampling, disturbance to native fauna, erosion, rubbish dumping, etc)				
	Reduce the impact of visitors throughout the Park	DEWNR – signage established in strategic locations to inform visitors of the Park’s biodiversity values and the regulations that apply	Instal additional signage, for example at the eastern end of the Park on the Waitpinga Cliffs (MU15) where mountain bikers enter the Park and illegally ride along the Heysen Trail.	L
THREATENED FAUNA SPECIES				
Hooded Plover	Improved breeding success	Protection (temporary fencing and signage) of known breeding sites	<ul style="list-style-type: none"> Continue to protect breeding sites by restricting access to parts of beaches (i.e. temporary fencing) Investigate and, if appropriate, implement a control program for foxes near Hooded Plover breeding sites Enforce the no dogs on beach rule in Newland Head Conservation Park Maintain/improve current levels of community awareness and involvement (i.e. community monitoring of nests) Implement other relevant actions as outlined in the Hooded Plover Recovery Plan 	VH
White-bellied Sea-eagle	Continued breeding success	Working protocol developed for protection of the WBSE nest within Newland Head	Enforce working protocol for protection of WBSE nest	VH
REVEGETATION				
Management Unit 12	Provide/ maintain self-sustaining mallee/woodland scrub habitat	FNHCP –tree, shrub and groundcover plantings undertaken	Continue revegetation works as appropriate, with densities and species appropriate for the habitat type. See suggested revegetation species list in Appendix 4	M
Management Unit 13	Provide/ maintain self-sustaining mallee/woodland scrub habitat	FNHCP –tree, shrub and groundcover plantings undertaken	Continue revegetation works as appropriate, with densities and species appropriate for the habitat type. See suggested revegetation species list in Appendix 4	M
Management Unit 15	Provide/ maintain self-sustaining mallee/woodland scrub habitat	FNHCP –tree, shrub and groundcover plantings undertaken	Monitor revegetation and undertake infill planting as appropriate, with densities and species appropriate for the habitat type. See suggested revegetation species list in Appendix 4	L
EROSION				

ISSUE/THREAT	5-Yr Objective	Actions to date – what/ who	Proposed actions- what/ where/how	Priority (H, M, L)
	No new incursions and reduced level of erosion as evidenced by aerial photography analysis.	DEWNR staff - annual assessment of walking tracks, roads for erosion issues Sand drift fencing installed in dunes	<ul style="list-style-type: none"> Continue annual assessment of walking tracks, roads and undertake erosion control measures as necessary Maintain boardwalks from carparks at Parsons Beach and Waitpinga Beach to the beach to encourage visitors to not go 'across country' through the dunes. Maintain sand drift fencing in sensitive areas (i.e. dune blow-outs at Waitpinga Beach) 	M
MONITORING				
	Monitor progress and success of works undertaken	17 x BushRAT site assessments and associated photopoints undertaken in 2015-2016	Repeat BushRAT site assessments every 5 years, including photopoints (Appendix 5)	M
			Record details of works as they are undertaken (ensure contractors do the same) - Use works record sheets (Appendix 6)	H

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Appendix 1: Plant species list

NATIVE PLANT SPECIES – NEWLAND HEAD CONSERVATION PARK

(These lists have been compiled from a number of sources including the 2004 Newland Head Conservation Park Management Plan, The Southern Fleurieu Coastal Action Plan and lists provided by FNHCP)

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary												
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>Acacia cupularis</i>	Cup Wattle			RA		2	3										✓
<i>Acacia longifolia ssp. sophorae</i>	Coastal Wattle				1	2	3					8	9	10	11		✓
<i>Acacia myrtifolia</i>	Myrtle Wattle											9	10				✓
<i>Acacia paradoxa</i>	Kangaroo Thorn								5	6		8		10			✓
<i>Acacia pycnantha</i>	Golden Wattle						4	5	6	7	8	9	10	11			✓
<i>Acacia spinescens</i>	Spiny Wattle							5									✓
<i>Acacia uncifolia</i>	Coast Silver Wattle			VU							7	8	9	10			✓
<i>Acacia verticillata ssp. ovoidea</i>	Prickly Moses			NT					6		8		10				✓
<i>Acaena echinata</i>	Sheep's Burr								6				10				✓
<i>Acaena novae-zelandiae</i>	Biddy-biddy										8						✓
<i>Acianthus pusillus</i>	Mosquito Orchid																✓
<i>Acrotriche affinis</i>	Ridged Ground-berry			RA					6			9		11			✓
<i>Acrotriche cordata</i>	Blunt-leaf Ground-berry			RA									10				✓
<i>Actites megalocarpus</i>	Coast Sow-thistle			RA													✓
<i>Adenanthos terminalis</i>	Yellow Gland-flower			RA			4		6	7		9		11			✓
<i>Adiantum aethiopicum</i>	Common Maiden-hair																✓
<i>Adriana quadripartita</i>	Coast Bitter-bush			RA													✓
<i>Allocasuarina muelleriana ssp. muelleriana</i>	Common Oak-bush										8						✓
<i>Allocasuarina pusilla</i>	Dwarf Oak-bush			RA								9	10	11			✓
<i>Allocasuarina striata</i>	Stalked Oak-bush			NT			3					9	10	11			✓
<i>Allocasuarina verticillata</i>	Drooping Sheoak								5		8						✓
<i>Alyxia buxifolia</i>	Sea Box			RA													✓
<i>Angianthus preissianus</i>	Salt Angianthus			VU													✓
<i>Anthosachne scabra</i>	Native Wheat-grass								5	6	8						✓
<i>Apalochlamys spectabilis</i>	Showy Firebush			VU													✓
<i>Apium annuum</i>	Annual Celery			VU													✓
<i>Apium prostratum var. filiforme</i>	Native Celery			NT												E	✓

²⁷ Note this is a compilation of existing data and includes species not observed during the inspection, but previously recorded on site

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary													
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷	
<i>Argentipallium obtusifolium</i>	Blunt Everlasting			VU													✓	
<i>Arthropodium strictum</i>	Common Vanilla-lily								5								✓	
<i>Asterolasia muricata</i>	Lemon Star-bush		R	EN													✓	
<i>Astroloma conostephioides</i>	Flame Heath						4			6					11		✓	
<i>Astroloma humifusum</i>	Cranberry Heath																✓	
<i>Atriplex semibaccata</i>	Berry Saltbush																✓	
<i>Austrofestuca littoralis</i>	Coast Festuca			EN													✓	
<i>Austrostipa curticomis</i>	Short-crest Spear-grass																✓	
<i>Austrostipa exilis</i>	Heath Spear-grass			RA													✓	
<i>Austrostipa flavescens</i>	Coast Spear-grass							5									✓	
<i>Austrostipa hemipogon</i>	Half-beard Spear-grass																✓	
<i>Austrostipa macalpinei</i>	Annual Spear-grass			RA													✓	
<i>Austrostipa mollis</i>	Soft Spear-grass						4										✓	
<i>Austrostipa mundula</i>	Neat Spear-grass			RA													✓	
<i>Austrostipa plumigera</i>										6								
<i>Austrostipa semibarbata</i>	Fibrous Spear-grass																✓	
<i>Austrostipa setacea</i>	Corkscrew Spear-grass			NT													✓	
<i>Austrostipa sp.</i>					1	2					7	8	9				✓	
<i>Austrostipa sp. 2</i>					1							8					✓	
<i>Austrostipa stipoides</i>	Coast Spear-grass			VU			3										✓	
<i>Baeckea crassifolia</i>	Desert Baeckea			VU			4			6			9		11		✓	
<i>Banksia marginata</i>	Silver Banksia						4						9	10	11		✓	
<i>Banksia ornata</i>	Desert Banksia			RA			4						9	10			✓	
<i>Baumea juncea</i>	Bare Twig-rush														11		✓	
<i>Beyeria lechenaultii</i>	Pale Turpentine Bush			NT													✓	
<i>Billardiera cymosa ssp. cymosa</i>	Sweet Apple-berry					2	3	4	5	6	7	8		10	11		✓	
<i>Billardiera uniflora</i>	One-flower Apple-berry			VU													✓	
<i>Billardiera versicolor</i>	Yellow-flower Apple-berry			VU													✓	
<i>Boronia filifolia</i>	Slender Boronia			NT											11		✓	
<i>Bossiaea prostrata</i>	Creeping Bossiaea								5								✓	
<i>Brachyloma ericoides ssp.</i>	Brush Heath			NT			4			6			9		11		✓	

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		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>ericoides</i>																	
<i>Brachyscome cuneifolia</i>	Wedge-leaf Daisy			VU													✓
<i>Brachyscome goniocarpa</i>	Dwarf Daisy			RA													✓
<i>Brachyscome lineariloba</i>	Hard-head Daisy			RA													✓
<i>Bromus arenarius</i>	Sand Brome			EN													✓
<i>Bulbine bulbosa</i>	Bulbine-lily			NT													✓
<i>Bulbine semibarbata</i>	Small Leek-lily			VU													
<i>Burchardia umbellata</i>	Milkmaids																✓
<i>Bursaria spinosa ssp. spinosa</i>	Sweet Bursaria							5									✓
<i>Caesia calliantha</i>	Blue Grass-lily																✓
<i>Caladenia bicalliata</i>	Western Daddy-long-legs		R	EN													✓
<i>Caladenia cardiochila</i>	Heart-lip Spider-orchid			EN													✓
<i>Caladenia latifolia</i>	Pink Caladenia			NT													✓
<i>Caladenia prolata</i>	Shy Caladenia			RA													✓
<i>Caladenia stricta</i>	Upright Caladenia			NT													✓
<i>Caladenia sp.</i>	Finniss Spider-orchid																✓
<i>Caladenia valida</i>	Robus Spider-orchid		E	EN													✓
<i>Calandrinia brevipedata</i>	Short-stalked Purslane			RA													✓
<i>Calandrinia calyptрата</i>	Pink Purslane			NT													✓
<i>Calandrinia corigioloides</i>	Strap Purslane			RA													✓
<i>Calandrinia eremaea</i>	Dryland Purslane			NT													✓
<i>Calandrinia granulifera</i>	Pigmy Purslane			NT													✓
<i>Callistemon rugulosus</i>	Scarlet Bottlebrush			RA													✓
<i>Calytrix glaberrima</i>	Smooth Heath-myrtle			RA								9	10	11			✓
<i>Calytrix tetragona</i>	Common Fringe-myrtle							5						11			✓
<i>Carex appressa</i>	Tall Sedge																✓
<i>Carex breviculmis</i>	Short-stem Sedge																✓
<i>Carpobrotus rossii</i>	Native Pigface											9					✓
<i>Cassinia complanata</i>	Sticky Cassinia			RA					6	7		9					✓
<i>Cassinia uncata</i>											8						✓
<i>Cassytha glabella f. dispar</i>	Slender Dodder-laurel						4								11		✓
<i>Centella asiatica</i>	Asian Centella			NT													✓

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		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>Centrolepis aristata</i>	Pointed Centrolepis																✓
<i>Centrolepis cephaloformis</i> ssp. <i>cephaloformis</i>	Cushion Centrolepis		R	VU													✓
<i>Centrolepis polygna</i>	Wiry Centrolepis																✓
<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue Squill																✓
<i>Chamaesyce drummondii</i>																	✓
<i>Cheilanthes austrotenuifolia</i>	Annual Rock-fern							5									✓
<i>Chenopodium pumilio</i>	Clammy Goosefoot																✓
<i>Choretrum glomeratum</i> var. <i>glomeratum</i>	White Sour-bush			RA													✓
<i>Chrysocephalum apiculatum</i>	Common Everlasting								6		8		10				✓
<i>Clematis microphylla</i>	Old Man's Beard				1			5	6	7							✓
<i>Comesperma polygaloides</i>	Mauve Milkwort			VU													✓
<i>Comesperma volubile</i>	Love Creeper			RA													✓
<i>Conospermum patens</i>	Slender Smoke-bush			RA													✓
<i>Convolvulus angustissimus</i> ssp. <i>angustissimus</i>	Australian Bindweed			NT		2					8						✓
<i>Convolvulus crispifolius</i>	Silver Bindweed																✓
<i>Coronidium scorpioides</i>	Button Everlasting							5									✓
<i>Correa alba</i> var. <i>pannosa</i>	White Correa		R	VU													✓
<i>Correa eburnea</i>	Deep Creek Correa	EN	V	VU													✓
<i>Correa pulchella</i>	Salmon Correa			RA					6								✓
<i>Correa reflexa</i> var. <i>reflexa</i>	Common Correa					3						9		11			✓
<i>Correa</i> sp.							4										✓
<i>Corybas despectans</i>	Coast Helmet-orchid		R	RA													✓
<i>Corybas</i> sp.																	✓
<i>Cotula australis</i>	Common Cotula																✓
<i>Cotula vulgaris</i> var. <i>australasica</i>	Slender Cotula			RA													✓
<i>Craspedia variabilis</i>	Billy-buttons																✓
<i>Crassula colligata</i> ssp. <i>colligata</i>					1												✓
<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula																✓

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<i>Crassula sp.</i>	Crassula					2											✓
<i>Cryptandra tomentosa</i>	Heath Cryptandra																✓
<i>Cullen australasicum</i> (possibly planted)	Tall Scurf-pea			RA													✓
<i>Cymbonotus preissianus</i>	Austral Bear's-ear			RA													✓
<i>Cynoglossum australe</i>	Australian Hounds-tongue			RA													✓
<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue			NT													✓
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge																✓
<i>Dampiera dyantha</i>	Shrubby Dampiera									6							✓
<i>Daucus glochidiatus</i>	Native Carrot																✓
<i>Daviesia brevifolia</i>	Leafless Bitter-pea				1	2		4				7		9			✓
<i>Daviesia pectinata</i>	Zig-zag Bitter-pea		R	EN													✓
<i>Daviesia ulicifolia ssp. incarnata</i>										6	7		9	10	11		✓
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT								8	9				✓
<i>Dianella longifolia var. grandis</i>	Pale Flax-lily		R	VU													✓
<i>Dianella revoluta var. revoluta</i>	Black-anther Flax-lily								5	6							✓
<i>Dichelachne crinita</i>	Long-hair Plume-grass																✓
<i>Dichondra repens</i>	Kidney Weed																✓
<i>Diuris brevifolia</i>	Short-leaf Donkey-orchid		E	VU													✓
<i>Dillwynia hispida</i>	Red Parrot-pea									6							✓
<i>Dillwynia sericea</i>	Showy Parrot-pea																✓
<i>Disphyma crassifolium ssp. clavellatum</i>	Round-leaf Pigface					2				6							✓
<i>Distichlis distichophylla</i>	Emu-grass				1	2											✓
<i>Dodonaea humilis</i>	Dwarf Hop-bush			VU													✓
<i>Drosera macrantha ssp. planchonii</i>	Climbing Sundew																✓
<i>Drosera whittakeri</i>																	✓
<i>Duma florulenta</i>	Lignum			VU												E	✓
<i>Dysphania pumilio</i>	Small Crumbweed																✓
<i>Einadia nutans ssp. nutans</i>	Climbing Saltbush																✓

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<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush					2												✓
<i>Epilobium billardierianum</i> ssp. <i>cinereum</i>	Variable Willow-herb			NT														✓
<i>Epilobium hirtigerum</i>	Hairy Willow-herb																	✓
<i>Erodium crinitum</i>	Blue Heron's-bill																	✓
<i>Eucalyptus baxteri</i>	Brown Stringybark															11		✓
<i>Eucalyptus calycogona</i> ssp. <i>calycogona</i>	Square-fruit Mallee			RA														✓
<i>Eucalyptus cneorifolia</i>	Kangaroo Island Narrow-leaf Mallee			VU						6								✓
<i>Eucalyptus cosmophylla</i>	Cup Gum						4			6	7	8	9	10	11			✓
<i>Eucalyptus diversifolia</i> ssp. <i>diversifolia</i>	Coastal White Mallee			RA			3	4		6			9	10	11			✓
<i>Eucalyptus fasciculosa</i>	Pink Gum		R	NT				4	5	6	7	8				11		✓
<i>Eucalyptus gracilis</i>	Yorrell			VU														✓
<i>Eucalyptus incrassata</i>	Ridge-fruited Mallee			RA						6								✓
<i>Eucalyptus leptophylla</i>	Narrow-leaf Red Mallee			RA				4								11		✓
<i>Eucalyptus leucoxydon</i> ssp. <i>leucoxydon</i>	South Australian Blue Gum			NT					5									✓
<i>Eucalyptus obliqua</i>	Messmate Stringybark														10			✓
<i>Eucalyptus odorata</i>	Peppermint Box			RA														✓
<i>Eucalyptus oleosa</i>	Red Mallee																	✓
<i>Eucalyptus phenax</i> ssp. <i>compressa</i>	Kangaroo Island Mallee		R	VU														✓
<i>Eucalyptus porosa</i>	Mallee Box			NT														✓
<i>Eucalyptus rugosa</i>	Coastal White Mallee			VU														✓
<i>Euchiton sphaericus</i>	Annual Cudweed																	✓
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	EN	E	EN						6								✓
<i>Eutaxia microphylla</i>	Common Eutaxia																	✓
<i>Exocarpos cupressiformis</i>	Native Cherry								5									✓
<i>Ficinia nodosa</i>	Knobby Club-rush				1	2											E	✓
<i>Frankenia pauciflora</i> var. <i>gunnii</i>	Southern Sea-heath																	✓
<i>Gahnia ancistrophylla</i>	Curled Saw-sedge			NT														✓

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<i>Gahnia deusta</i>	Limestone Saw-sedge			RA													✓
<i>Gahnia lanigera</i>	Black Grass Saw-sedge			NT									9				✓
<i>Gahnia trifida</i>	Cutting Grass			RA													✓
<i>Galium gaudichaudii</i> ssp. <i>gaudichaudii</i>	Rough Bedstraw																✓
<i>Galium migrans</i> ssp. <i>migrans</i>	Loose Bedstraw			RA													✓
<i>Geranium potentilloides</i>	Downy Geranium																✓
<i>Geranium retrorsum</i>	Grassland Geranium																✓
<i>Glycine rubiginosa</i>	Twining Glycine			NT													✓
<i>Gnaphalium indutum</i>	Tiny Cudweed			RA													✓
<i>Gonocarpus mezianus</i>	Broad-leaf Raspwort							5	6	7							✓
<i>Gonocarpus tetragynus</i>	Small-leaf Raspwort						4		6			9		11			✓
<i>Goodenia amplexans</i>	Clasping Goodenia			NT		2						9					✓
<i>Goodenia geniculata</i>	Bent Goodenia																✓
<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia			NT										11			✓
<i>Goodenia varia</i>	Sticky Goodenia			RA													✓
<i>Goodenia willisiana</i>	Silver Goodenia			RA													✓
<i>Grevillea ilicifolia</i> ssp. <i>ilicifolia</i>	Holly-leaf Grevillea			VU					6	7		9					✓
<i>Grevillea lavandulacea</i>	Spider-flower								6			9	10				✓
<i>Gyrostemon australasicus</i>	Buckbush Wheel-fruit			RA													✓
<i>Hakea mitchellii</i>	Heath Needlebush			VU			4										✓
<i>Hakea rostrata</i>	Beaked Hakea						4					9					✓
<i>Hakea rugosa</i>	Dwarf Hakea			NT					6		8		10	11			✓
<i>Hardenbergia violacea</i>	Native Lilac			NT								9	10				✓
<i>Helichrysum leucopsidium</i>	Satin Everlasting			NT					6								✓
<i>Hemichroa pentandra</i>	Trailing Hemichroa			EN													✓
<i>Hibbertia crinita</i>				NT		2											
<i>Hibbertia riparia</i>	Bristly Guinea-flower								6								✓
<i>Hibbertia sericea</i>	Silky Guinea-flower			NT			4					9					✓
<i>Hibbertia virgata</i>	Twiggy Guinea-flower			NT			4	5						11			✓
<i>Hyalosperma demissum</i>	Dwarf Sunray					2											✓
<i>Hydrocotyle callicarpa</i>	Tiny Pennywort			RA													✓
<i>Hydrocotyle capillaris</i>	Thread Pennywort																✓

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<i>Hydrocotyle comocarpa</i>	Fringe-fruit Pennywort		R	VU													✓
<i>Hypolaena fastigiata</i>	Tassel Rope-rush			NT				4					9		11		✓
<i>Isolepis cernua</i>	Nodding Club-rush																✓
<i>Isolepis stellata</i>	Star Club-rush			RA													✓
<i>Isopogon ceratophyllus</i>	Horny Cone-bush												9		11		✓
<i>Ixodia achillaeoides</i> ssp. <i>achillaeoides</i>	Coast Ixodia												9				✓
<i>Juncus krausii</i>	Sea Rush															E	✓
<i>Juncus pallidus</i>	Pale Rush															E	✓
<i>Juncus pauciflorus</i>	Loose-flower Rush			NT													✓
<i>Juncus subsecundus</i>	Finger Rush											8					✓
<i>Kennedia prostrata</i>	Scarlet Runner					2	3			6							✓
<i>Kunzea pomifera</i>	Muntries			RA				4	5								✓
<i>Lachnagrostis billardierei</i> ssp. <i>billardierei</i>	Coast Blown-grass			RA						6							✓
<i>Lachnagrostis filliformis</i>	Common Blown-grass				1												✓
<i>Lasiopetalum baueri</i>	Slender Velvet-bush			RA													✓
<i>Lasiopetalum discolor</i>	Coast Velvet-bush			VU				4					9				✓
<i>Lasiopetalum schulzenii</i>	Drooping Velvet-bush			EN													✓
<i>Laxmannia orientalis</i>	Dwarf Wire-lily												9		11		✓
<i>Leiocarpa supina</i>	Coast Plover-daisy			VU		2	3										✓
<i>Lepidobolus drapetocoleus</i>	Scale Shedder			RA				4					9		11		✓
<i>Lepidosperma canescens</i>	Hoary Rapier-sedge																✓
<i>Lepidosperma carphoides</i>	Black Rapier-sedge							4	5					10			✓
<i>Lepidosperma concavum/congestum</i>	Spreading Sword-sedge							4	5				9		11		✓
<i>Lepidosperma congestum</i>				RA				4									✓
<i>Lepidosperma curtisiae</i>	Little Sword-sedge			NT													✓
<i>Lepidosperma gladiatum</i>	Coast Sword-sedge			NT	1	2	3										✓
<i>Lepidosperma viscidum</i>	Sticky Sword-sedge											8					✓
<i>Leporella fimbriata</i>	Fringed Hare-orchid			NT													✓
<i>Leptocarpus brownii</i>	Coarse Twine-rush																✓
<i>Leptorhynchos squamatus</i> ssp.	Scaly Buttons																✓

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<i>squamatus</i>																	
<i>Leptospermum continentale</i>	Prickly Tea-tree																✓
<i>Leptospermum myrsinoides</i>	Heath Tea-tree						4				8	9	10	11			✓
<i>Leucophyta brownii</i>	Coast Cushion Bush			NT		2											✓
<i>Leucopogon rufus</i>	Ruddy Beard-heath			NT													✓
<i>Leucopogon parviflorus</i>	Coast Beard-heath			NT	1	2	3	4		6	7		9				✓
<i>Leucopogon virgatus var. virgatus</i>	Common Beard-heath											9					✓
<i>Levenhookia dubia</i>	Hairy Stylewort																✓
<i>Levenhookia pusilla</i>	Tiny Stylewort																✓
<i>Lilaeopsis polyantha</i>	Australian Lilaeopsis			VU													✓
<i>Linum marginale</i>	Native Flax																✓
<i>Lissanthe strigosa ssp. subulata</i>	Peach Heath																✓
<i>Logania crassifolia</i>	Coast Logania			RA													✓
<i>Logania linifolia</i>	Flax-leaf Logania			VU													✓
<i>Logania minor</i>	Spoon-leaf Logania			EN													✓
<i>Lomandra collina</i>	Sand Mat-rush			RA								9					✓
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush								6		8		10				✓
<i>Lomandra effusa</i>	Scented Mat-rush			NT		2	3					9					✓
<i>Lomandra juncea</i>	Desert Mat-rush			RA			4										✓
<i>Lomandra micrantha ssp. micrantha</i>	Small-flower Mat-rush								6				10				✓
<i>Lomandra micrantha ssp. tuberculata</i>	Small-flower Mat-rush						4					9		11			✓
<i>Lomandra multiflora ssp. dura</i>	Hard Mat-rush								6								✓
<i>Lomandra nana</i>	Small Mat-rush																✓
<i>Lomandra sororia</i>	Sword Mat-rush			NT													✓
<i>Lotus australis</i>	Austral Trefoil			NT													✓
<i>Luzula meridionalis</i>	Common Wood-rush								6								✓
<i>Maireana enchylaenoides</i>	Wingless Fissure-plant																✓
<i>Malva preissiana</i>	Australian Hollyhock			NT													✓
<i>Melaleuca brevifolia</i>	Short-leaf Honey-myrtle			VU													✓
<i>Melaleuca decussata</i>	Totem-poles			NT					6		8		10		E		✓

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<i>Melaleuca gibbosa</i>	Slender Honey-myrtle																✓
<i>Melaleuca lanceolata</i>	Dryland Tea-tree			RA									9	10			✓
<i>Micrantheum demissum</i>	Dwarf Micrantheum			RA													✓
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Rice-grass																✓
<i>Microseris lanceolata</i>	Yam Daisy																✓
<i>Microtis</i> sp.										6							✓
<i>Millotia myosotidifolia</i>	Broad-leaf Millotia			NT													✓
<i>Millotia tenuifolia</i> var. <i>tenuifolia</i>	Soft Millotia																✓
<i>Minuria leptophylla</i>	Minnie Daisy			RA			4										✓
<i>Muehlenbeckia adpressa</i>	Climbing Lignum			NT													✓
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum				1	2			5		7			10		E	✓
<i>Myoporum insulare</i>	Common Boobialla			NT		2	3	4						10		E	✓
<i>Myoporum petiolatum</i>	Sticky Boobialla																✓
<i>Myosotis australis</i>	Austral Forget-me-not			RA													✓
<i>Neurachne alopecuroidea</i>	Fox-tail Mulga-grass						4	5									✓
<i>Nicotiana maritima</i>	Coast Tobacco			RA													✓
<i>Olearia axillaris</i>	Coast Daisy-bush			NT	1	2	3	4		6	7		9	10			✓
<i>Olearia pannosa</i> ssp. <i>pannosa</i>	Silver Daisy-bush			EN													✓
<i>Olearia ramulosa</i>	Twiggy Daisy-bush						4	5									✓
<i>Opercularia turpis</i>	Twiggy Stinkweed			NT						6			9				✓
<i>Ophioglossum lusitanicum</i>	Austal Adder's-tongue			NT													✓
<i>Orthoceras strictum</i>	Horned Orchid			RA													✓
<i>Oxalis perennans</i>	Native Sorrel																✓
<i>Ozothamnus turbinatus</i>	Coast Bush-everlasting			EN													✓
<i>Parietaria cardiostegia</i>	Smooth-nettle																✓
<i>Patersonia fragilis</i>	Short Purple-flag			VU											11		✓
<i>Pelargonium australe</i>	Austral Stork's-bill			RA	1												✓
<i>Persicaria prostrata</i>	Creeping Knotweed			NT													✓
<i>Persicaria decipiens</i>	Slender Knotweed															E	✓
<i>Persoonia juniperina</i>	Prickly Geebung			NT													✓
<i>Philothea pungens</i>	Prickly Wax-flower			VU													✓

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary												
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>Phragmites australis</i>	Common Reed															E	✓
<i>Phyllanthus striaticaulis</i>	Southern Spurge			VU													✓
<i>Phyllota pleurandroides</i>	Heathy Phyllota			VU													✓
<i>Picris angustifolia ssp. angustifolia</i>	Coast Picris			RA													✓
<i>Picris squarrosa</i>	Squat Picris			EN													✓
<i>Pimelea glauca</i>	Smooth Riceflower			NT													✓
<i>Pimelea humilis</i>	Low Riceflower							5			8						✓
<i>Pimelea phyllicoides</i>	Heath Riceflower																✓
<i>Pimelea serpyllifolia ssp. serpyllifolia</i>	Thyme Riceflower			NT	1	2	3	4		6							✓
<i>Pimelea stricta</i>	Erect Riceflower																✓
<i>Plantago hispida</i>	Hairy Plantain			NT													✓
<i>Platysace heterophylla</i>	Slender Platysace									6							
<i>Platylobium obtusangulum</i>	Holly Flat-pea						4	5				9	10	11			✓
<i>Poa halmaturina</i>	Kangaroo Island Poa			RA													✓
<i>Poa poiformis var. poiformis</i>	Coast Tussock-grass				1												✓
<i>Poa tenera</i>	Slender Tussock-grass			NT													✓
<i>Podotheca angustifolia</i>	Sticky Long-heads			NT		2	3										✓
<i>Pogonolepis muelleriana</i>	Stiff Cup-flower			NT		2											✓
<i>Pomaderris obcordata</i>	Wedge-leaf Pomaderris			RA													✓
<i>Pomaderris paniculosa ssp. paniculosa</i>	Mallee Pomaderris			NT		2											✓
<i>Poranthera microphylla</i>	Small Poranthera																✓
<i>Potamogeton pectinatus</i>	Fennel Pondweed			VU													✓
<i>Prostanthera chlorantha</i>	Green Mintbush		R	RA													✓
<i>Pseudanthus micranthus</i>	Fringed Pseudanthus		R	RA			4										✓
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed																✓
<i>Pterostylis alata</i>	Tall Shell-orchid																✓
<i>Pterostylis dolichochila</i>	Mallee Shell-orchid			RA													✓
<i>Pterostylis nana</i>	Dwarf Greenhood																✓
<i>Pterostylis sp.</i>	Tiny Greenhood																✓
<i>Ptilotus erubescens</i>	Hairy-tails		R	RA													✓
<i>Ptilotus spathulatus</i>	Pussy-tails			RA													✓

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary													
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷	
<i>Puccinellia stricta</i>	Australian Saltmarsh-grass			RA													✓	
<i>Pultenaea canaliculata</i>	Soft Bush-pea			NT						6			9	10			✓	
<i>Pultenaea densifolia</i>	Dense Bush-pea			VU													✓	
<i>Pultenaea tenuifolia</i>	Narrow-leaf Bush-pea			RA		2	3			6							✓	
<i>Pultenaea trinervis</i>	Three-nerve Bush-pea			VU									9				✓	
<i>Pyrorchis nigricans</i>	Black Fire-orchid																✓	
<i>Ranunculus amphitrichus</i>	Small River Buttercup			RA													✓	
<i>Ranunculus lappaceus</i>	Native Buttercup																✓	
<i>Ranunculus pachycarpus</i>	Thick-fruit Buttercup			VU													✓	
<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>	Annual Buttercup																✓	
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush				1	2	3		5	6	7	8	9	10	11	E	✓	
<i>Rhodanthe laevis</i>	Smooth Daisy			RA													✓	
<i>Rumex brownii</i>	Slender Dock																✓	
<i>Rytidosperma auriculatum</i>	Lobed Wallaby-grass											8					✓	
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass														12		✓	
<i>Rytidoposperma duttonianum</i>	Brown-back Wallaby-grass																✓	
<i>Rytidosperma geniculatum</i>	Knead Wallaby-grass									6		8					✓	
<i>Rytidosperma pilosum</i>	Velvet Wallaby-grass			NT													✓	
<i>Rytidosperma racemosum</i> var. <i>racemosum</i>	Slender Wallaby-grass																✓	
<i>Rytidosperma setaceum</i>	Small-flower Wallaby-grass					2	3	4	5	6			9				✓	
<i>Rytidosperma</i> sp.						2	3			6		8		10	11		✓	
<i>Rytidosperma</i> sp.	Short-awn Wallaby-grass													10	11		✓	
<i>Samolus repens</i>	Creeping Brookweed			NT		2										E	✓	
<i>Santalum acuminatum</i>	Quandong			RA													✓	
<i>Santalum murrayanum</i>	Bitter Quandong			VU													✓	
<i>Sarcocornia blackiana</i>	Thick-head Samphire			RA													✓	

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary												
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT													✓
<i>Scaevola albida</i>	Pale Fanflower																✓
<i>Scaevola crassifolia</i>	Cushion Fanflower			VU													✓
<i>Scaevola linearis ssp. confertifolia</i>	Bundled Fanflower			VU													✓
<i>Schenkia australis</i>	Spike Centaury			RA													✓
<i>Schoenoplectus pungens</i>	Spiky Club-rush			RA											E		✓
<i>Schoenus apogon</i>	Common Bog-rush									6		8	9				✓
<i>Schoenus breviculmis</i>	Matted Bog-rush																✓
<i>Schoenus deformis</i>	Small Bog-rush			VU													✓
<i>Schoenus nitens</i>	Shiny Bog-rush			RA													✓
<i>Sclerolaena diacantha</i>	Grey Bindyi			RA													✓
<i>Senecio glossanthus</i>	Annual Groundsel			NT													✓
<i>Senecio hispidissimus</i>	Rough Groundsel			VU													✓
<i>Senecio hispidulus</i>	Rough Groundsel																✓
<i>Senecio odoratus</i>	Scented Groundsel			NT	1	2	3			6	7			10			✓
<i>Senecio phelleus</i>	Woodland Groundsel			NT													✓
<i>Senecio picridioides</i>	Purple-leaf Groundsel																✓
<i>Senecio pinnatifolius</i>				NT							7						✓
<i>Senecio quadridentatus</i>	Cotton Groundsel																✓
<i>Solanum laciniatum</i>	Cut-leaf Kangaroo-apple			NT													✓
<i>Solenogyne dominii</i>	Smooth Solenogyne			NT													✓
<i>Spergularia sp.</i>																	✓
<i>Spinifex hirsutus</i>	Rolling Spinifex				1												✓
<i>Sporobolus virginicus</i>	Salt Couch																✓
<i>Spyridium coactillifolium</i>	Butterfly Spyridium	VU	V	VU			3			6			9				✓
<i>Stellaria angustifolia</i>	Swamp Starwort																✓
<i>Stenanthemum leucophractum</i>	White Cryptandra			VU													✓
<i>Stenopetalum lineare</i>	Narrow Thread-petal			RA													✓
<i>Stuartina muelleri</i>	Spoon Cudweed																✓
<i>Stylidium perpusillum</i>	Tiny Trigger-plant			VU													✓
<i>Styphelia exarrhena</i>	Desert Heath			RA													✓
<i>Suaeda australis</i>	Austral Seablite			NT											E		✓

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary												
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>Swainsona lessertiifolia</i>	Coast Swainson-pea			VU	1												✓
<i>Tetragonia implexicoma</i>	Bower Spinach				1	2	3		5		7						✓
<i>Thelymitra benthamiana</i>	Leopard Sun-orchid			RA													✓
<i>Thelymitra canaliculata</i>	Azure Sun-orchid																✓
<i>Thelymitra holmesii</i>	Blue Star Sun-orchid		V	EN													✓
<i>Thelymitra pauciflora</i>	Slender Sun-orchid																✓
<i>Thelymitra rubra</i>	Salmon Sun-orchid																✓
<i>Thelymitra sp.</i>										6					11		✓
<i>Themeda triandra</i>	Kangaroo Grass											8					✓
<i>Thomasia petalocalyx</i>	Paper-flower			NT													✓
<i>Threlkeldia diffusa</i>	Coast Bonefruit			NT	1		3									E	✓
<i>Tyridia repens</i>																E	✓
<i>Thysanotus baueri</i>	Mallee Fringe-lily			VU													✓
<i>Thysanotus patersonii</i>	Twining Fringe-lily									6			9				✓
<i>Thysanotus racemoides</i>	Rush Fringe-lily																
<i>Tribolium sp.</i>												8					✓
<i>Tricoryne tenella</i>	Tufted Yellow Rush-lily			RA									9				✓
<i>Triglochin calcitrapum</i>	Spurred Arrowgrass																✓
<i>Triglochin procerum</i>	Water-ribbons			NT													✓
<i>Triglochin striata</i>	Streaked Arrowgrass			NT													✓
<i>Triglochin trichophora</i>				VU													✓
<i>Triodia compacta</i>	Spinifex			VU													✓
<i>Typha domingensis</i>	Narrow-leaf Bulrush															E	✓
<i>Utricularia tenella</i>	Pink Bladderwort			RA													✓
<i>Velleia paradoxa</i>	Spur Velleia			RA													✓
<i>Veronica hillebrandii</i>	Rigid Speedwell			VU													✓
<i>Vittadinia australasica var. australasica</i>	Sticky New Holland Daisy			NT											11		✓
<i>Vittadinia gracilis</i>	Woolly New-Holland Daisy													10			✓
<i>Wahlenbergia gracilentia</i>	Annual Bluebell																✓
<i>Wahlenbergia luteola</i>	Yellow-wash Bluebell			RA													✓
<i>Wahlenbergia stricta ssp. stricta</i>	Tall Bluebell																✓

Name	Common Name	Conservation Status*			BushRAT Assessment 1-11 and Estuary												
		AUS	SA	AMLR	1	2	3	4	5	6	7	8	9	10	11	Estuary	All ²⁷
<i>Wilsonia backhousei</i>	Narrow-leaf Wilsonia			EN		2											✓
<i>Wilsonia humilis var. humilis</i>	Silky Wilsonia			VU													✓
<i>Wilsonia rotundifolia</i>	Round-leaf Wilsonia			VU													✓
<i>Wurmbea dioica ssp. dioica</i>	Early Nancy																✓
<i>Xanthorrhoea semiplana ssp. tateana</i>	Tate's Grass-tree		R	RA				4	5	6			9	10	11		✓
<i>Xanthosia huegelii</i>	Hairy Xanthosia																✓
<i>Xerochrysum bracteatum</i>	Golden Everlasting			RA						6		8					✓
<i>Zieria veronia</i>	Pink Zieria			VU													✓
<i>Zygophyllum billardierei</i>	Coast Twinleaf			EN													✓

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²⁸ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

Bush RAT Assessments 12-17

Name	Common_Name	Conservation Status*			BushRAT Assessments 12-17					
		AUS	SA	AMLR	12	13	14	15	16	17
<i>Acacia longifolia ssp. sophorae</i>	Coastal Wattle				12	13				
<i>Acacia paradoxa</i>	Kangaroo Thorn				12					
<i>Acacia pycnantha</i>	Golden Wattle				12					
<i>Acacia spinescens</i>	Spiny Wattle					13	14			
<i>Acacia uncifolia</i>	Coast Silver Wattle			VU			14	15	16	
<i>Acrotriche cordata</i>	Blunt-leaf Ground-berry			RA		13	14			
<i>Adriana quadripartita</i>	Coast Bitter-bush			RA					16	
<i>Austrostipa sp.</i>									16	17
<i>Baeckea crassifolia</i>	Desert Baeckea			VU	12					
<i>Beyeria lechenaultii</i>	Pale Turpentine Bush			NT		13	14			
<i>Billardiera cymosa ssp. cymosa</i>	Sweet Apple-berry				12	13	14			
<i>Bursaria spinosa ssp. spinosa</i>	Sweet Bursaria				12					
<i>Calytrix tetragona</i>	Common Fringe-myrtle				12	13	14			
<i>Carpobrotus rossii</i>	Native Pigface					13	14	15		
<i>Clematis microphylla</i>	Old Man's Beard				12				16	17
<i>Correa pulchella</i>	Salmon Correa			RA		13	14	15		
<i>Daviesia ulicifolia ssp. incarnata</i>					12					
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT	12	13	14	15		
<i>Dodonaea viscosa (Planted?)</i>	Hop-bush			RA	12					
<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush					13		15		
<i>Eucalyptus cosmophylla</i>	Cup Gum				12					
<i>Eucalyptus diversifolia ssp. diversifolia</i>	Coastal White Mallee			RA	12	13	14	15		17
<i>Eucalyptus fasciculosa</i>	Pink Gum		R	NT	12					
<i>Eutaxia microphylla</i>	Common Eutaxia						14			
<i>Exocarpos cupressiformis</i>	Native Cherry						14			
<i>Ficinia nodosa</i>	Knobby Club-rush				12			15		17
<i>Gahnia lanigera</i>	Black Grass Saw-sedge			NT		13	14			
<i>Grevillea ilicifolia ssp. ilicifolia</i>	Holly-leaf Grevillea			VU		13	14			

Name	Common_Name	Conservation Status*			BushRAT Assessments 12-17					
		AUS	SA	AMLR	12	13	14	15	16	17
<i>Helichrysum leucopsideum</i>	Satin Everlasting			NT		13	14			
<i>Hypolaena fastigiata</i>	Tassel Rope-rush			NT	12					
<i>Kunzea pomifera</i>	Muntries			RA	12		14			
<i>Lasiopetalum discolor</i>	Coast Velvet-bush			VU		13	14			
<i>Leiocarpa supina</i>	Coast Plover-daisy			VU		13				
<i>Lepidosperma concavum/congestum</i>	Spreading Sword-sedge					13	14			
<i>Lepidosperma gladiatum</i>	Coast Sword-sedge							15	16	
<i>Leucophyta brownii</i>	Coast Cushion Bush			NT		13				
<i>Leucopogon parviflorus</i>	Coast Beard-heath			NT	12	13	14	15	16	
<i>Leucopogon virgatus var. virgatus</i>	Common Beard-heath					13				
<i>Logania crassifolia</i>	Coast Logania			RA		13	14			
<i>Lomandra collina</i>	Sand Mat-rush			RA		13	14			
<i>Lomandra effusa</i>	Scented Mat-rush			NT		13	14			
<i>Lomandra micrantha ssp. tuberculata</i>	Small-flower Mat-rush				12					
<i>Lomandra multiflora ssp. dura</i>	Hard Mat-rush						14			
<i>Melaleuca lanceolata</i>	Dryland Tea-tree			RA		13	14	15	16	
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum								16	
<i>Myoporum insulare</i>	Common Boobialla			NT	12				16	
<i>Olearia axillaris</i>	Coast Daisy-bush			NT	12	13	14	15	16	
<i>Pimelea serpyllifolia ssp. serpyllifolia</i>	Thyme Riceflower			NT	12	13		15		17
<i>Poa poiformis var. poiformis</i>	Coast Tussock-grass					13				
<i>Podotheca angustifolia</i>	Sticky Long-heads			NT			14			
<i>Pomaderris obcordata</i>	Wedge-leaf Pomaderris			RA		13	14			
<i>Rhagodia candolleana ssp. candolleana</i>	Sea-berry Saltbush				12	13	14	15	16	17
<i>Rytidosperma sp.</i>						13				
<i>Scaevola crassifolia</i>	Cushion Fanflower			VU		13	14			
<i>Schoenus apogon</i>	Common Bog-rush					13	14			
<i>Senecio odoratus</i>	Scented Groundsel			NT	12		14	15	16	17
<i>Senecio pinnatifolius var. pinnatifolius</i>				NT		13	14			

Name	Common_Name	Conservation Status*			BushRAT Assessments 12-17					
		AUS	SA	AMLR	12	13	14	15	16	17
<i>Spyridium coactifolium</i>	Butterfly Spyridium	VU	V	VU		13				
<i>Tetragonia implexicoma</i>	Bower Spinach					13		15	16	
<i>Vittadinia australasica</i> var. <i>australasica</i>	Sticky New Holland Daisy			NT						17
<i>Xanthorrhoea semiplana</i> ssp. <i>tateana</i>	Tate's Grass-tree		R	RA	12			15		17

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WEED SPECIES NEWLAND HEAD CONSERVATION PARK

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Acacia anceps</i>															✓
<i>Acacia baileyana</i>	Cootamundra Wattle														✓
<i>Acacia cyclops</i>	Western Coastal Wattle														✓
<i>Acacia longifolia ssp. longifolia</i>	Sallow Wattle								8						✓
<i>Acacia mearnsii</i>	Black Wattle														✓
<i>Acacia saligna</i>	Golden Wreath Wattle														✓
<i>Acetosella vulgaris</i>	Sorrel														✓
<i>Agave americana</i>	Century Plant														✓
<i>Aira cupaniana</i>	Small Hair-grass														✓
<i>Ammophila arenaria</i>	Marram Grass	1													✓
<i>Anagallis arvensis</i>	Pimpernel	1	2												✓
<i>Arctotheca calendula</i>	Cape Weed								8		10	11	E		✓
<i>Asparagus asparagoides f. asparagoides</i>	Bridal Creeper	1	2			5	6	7		9	10		E		✓
<i>Asparagus declinatus</i>															✓
<i>Asparagus densiflorus</i>	Asparagus Fern														✓
<i>Asphodelus fistulosus</i>	Onion Weed												E		✓
<i>Atriplex prostrata</i>	Creeping Saltbush												E		✓
<i>Avellinia michelii</i>	Avellinia														✓
<i>Avena barbata</i>	Bearded Oat	1	2			5	6	7	8		10				✓
<i>Avena fatua</i>	Wild Oat														✓
<i>Billardiera heterophylla</i>	Blue-bell Creeper														✓
<i>Brachypodium distachyon</i>	False Brome														✓
<i>Brassica tournefortii</i>	Wild Turnip														✓
<i>Briza maxima</i>	Large Quaking-grass					5	6	7	8						✓
<i>Briza minor</i>	Lesser Quaking-grass					5									✓
<i>Bromus diandrus</i>	Great Brome														✓

³⁰ Note this includes species not observed during the inspection, but previously recorded on site

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome					5									✓
<i>Bromus madritensis</i>	Compact Brome														✓
<i>Bromus</i> sp.	Rigid Brome	1	2												✓
<i>Bromus rubens</i>	Red Brome														✓
<i>Bupleurum semicompositum</i>	Hare's Ear														✓
<i>Cakile maritima</i> ssp. <i>maritima</i>	Two-horned Sea Rocket	1		3											✓
<i>Carduus tenuiflorus</i>	Slender Thistle												E		✓
<i>Carpobrotus chilensis</i>	Angled Pigface														✓
<i>Carpobrotus edulis</i> ssp. <i>edulis</i>	Hottentot Fig														✓
<i>Carrichtera annua</i>	Ward's Weed														✓
<i>Catapodium rigidum</i>	Rigid Fescue	1													✓
<i>Cenchrus clandestinus</i>	Kikuyu												E		✓
<i>Centaurea melitensis</i>	Malta Thistle	1	2		4										✓
<i>Centaureum tenuiflorum</i>	Branched Centaury			3											✓
<i>Cerastium balearicum</i>	Chickweed														✓
<i>Cerastium glomeratum</i>	Common Mouse-ear Chickweed	1													✓
<i>Cerastium pumilum</i>	Chickweed														✓
<i>Chenopodium album</i>	Fat Hen														✓
<i>Chenopodium glaucum</i>	Glaucous Goosefoot														✓
<i>Chondrilla juncea</i>	Skeleton Weed							8							✓
<i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i>	Boneseed				4							11			✓
<i>Cirsium vulgare</i>	Spear Thistle														✓
<i>Citrullus lanatus</i>	Bitter Melon														✓
<i>Conyza bonariensis</i>	Flax-leaf Fleabane														✓
<i>Cotula coronopifolia</i>	Water Buttons												E		✓
<i>Crassula natans</i> var. <i>minus</i>	Water Crassula														✓
<i>Crepis foetida</i> ssp. <i>foetida</i>	Stinking Hawksbeard														✓

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch														✓
<i>Cynosurus echinatus</i>	Rough Dog's-tail Grass														✓
<i>Cyperus tenellus</i>	Tiny Flat-sedge														✓
<i>Dactylis glomerata</i>	Cocksfoot														✓
<i>Diplotaxis muralis</i> var. <i>muralis</i>	Wall Rocket														✓
<i>Disa bracteata</i>	South African Weed Orchid						6		8		10				✓
<i>Dittrichia graveolens</i>	Stinkweed														✓
<i>Echium plantagineum</i>	Salvation Jane														✓
<i>Ehrharta calycina</i>	Perennial Veldt Grass						6	7	8		10	11			✓
<i>Ehrharta longiflora</i>	Annual Veldt Grass	1	2			5	6	7	8	9		11			✓
<i>Ehrharta villosa</i> var. <i>maxima</i>	Pyp Grass														✓
<i>Erodium botrys</i>	Long Heron's-bill														✓
<i>Erodium brachycarpum</i>	Short-fruit Heron's-bill														✓
<i>Erodium cicutarium</i>	Cut-leaf Heron's-bill														✓
<i>Erodium moschatum</i>	Musky Herons-bill								8						✓
<i>Euphorbia paralias</i>	Sea Spurge												E		✓
<i>Euphorbia peplus</i>	Petty Spurge														✓
<i>Euphorbia terracina</i>	False Caper	1											E		✓
<i>Foeniculum vulgare</i>	Fennel														✓
<i>Freesia cultivar</i>	Freesia														✓
<i>Fumaria capreolata</i>	White-flower Fumitory												E		✓
<i>Fumaria muralis</i> ssp. <i>muralis</i>	Wall Fumitory														✓
<i>Galenia pubescens</i> var. <i>pubescens</i>	Coastal Galenia														✓
<i>Galium divaricatum</i>	Slender Bedstraw														✓
<i>Galium murale</i>	Small Bedstraw														✓
<i>Geranium dissectum</i>	Cut-leaf Geranium														✓
<i>Geranium molle</i> var. <i>molle</i>	Soft Geranium														✓
<i>Gladiolus tristis</i>	Evening-flower												E		✓

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰
		1	2	3	4	5	6	7	8	9	10	11		
	Gladiolus													
<i>Gomphocarpus cancellatus</i>	Broad-leaf Cotton-bush													✓
<i>Heliotropium europaeum</i>	Common Heliotrope													✓
<i>Holcus lanatus</i>	Yorkshire Fog													✓
<i>Hordeum glaucum</i>	Blue Barley-grass													✓
<i>Hordeum leporinum</i>	Wall Barley-grass													✓
<i>Hordeum marinum</i>	Sea Barley-grass													✓
<i>Hornungia procumbens</i>	Oval Purse													✓
<i>Hypochaeris glabra</i>	Smooth Cat's Ear				4	5			8	9				✓
<i>Hypochaeris radicata</i>	Rough Cat's Ear										10	11		✓
<i>Isolepis marginata</i>	Little Club-rush												E	✓
<i>Juncus capitatus</i>	Dwarf Rush													✓
<i>Kickxia elatine ssp. crinita</i>	Twining Toadflax													✓
<i>Lactuca serriola f. serriola</i>	Prickly Lettuce													✓
<i>Lagurus ovatus</i>	Hare's Tail Grass	1	2	3		5	6	7	8	9	10	11	E	✓
<i>Lathyrus tingitanus</i>	Tangier Pea	1												✓
<i>Lavandula dentata var. candicans</i>	French Lavender													✓
<i>Leptospermum laevigatum</i>	Coast Tea-tree		2											✓
<i>Limonium companyonis</i>	Sea-lavender	1	2	3										✓
<i>Linum strictum ssp. strictum</i>	Upright Yellow Flax													✓
<i>Logfia gallica</i>	Narrow Cudweed													✓
<i>Lolium loliaceum</i>	Stiff Ryegrass													✓
<i>Lolium sp.</i>	Perennial Ryegrass	1				5								✓
<i>Lolium rigidum</i>	Wimmera Ryegrass													✓
<i>Lupinus cosentinii</i>	Blue Lupin													✓
<i>Lycium ferocissimum</i>	African Boxthorn													✓
<i>Malva parviflora</i>	Small-flower Marshmallow												E	✓
<i>Marrubium vulgare</i>	Horehound													✓

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Medicago littoralis</i>	Strand Medic														✓
<i>Medicago polymorpha</i> var. <i>polymorpha</i>	Burr-medic														✓
<i>Medicago praecox</i>	Small-leaf Burr-medic														✓
<i>Melilotus indicus</i>	King Island Melilot														✓
<i>Minuartia mediterranea</i>	Slender Sandwort														✓
<i>Moenchia erecta</i>	Erect Chickweed														✓
<i>Moraea flaccida</i>	One-leaf Cape Tulip														✓
<i>Moraea setifolia</i>	Thread Iris								8		10				✓
<i>Myosotis sylvatica</i>	Wood Forget-me-not		2												✓
<i>Nicotiana glauca</i>	Tree Tobacco														✓
<i>Oenothera stricta</i> ssp. <i>stricta</i>	Common Evening Primrose												E		✓
<i>Olea europaea</i> ssp. <i>europaea</i>	Olive	1													✓
<i>Onopordum acaulon</i>	Horse Thistle														✓
<i>Ornithopus compressus</i>	Neat Bird's-foot														✓
<i>Oxalis pes-caprae</i>	Soursob												E		✓
<i>Oxalis purpurea</i>	One-o'clock														✓
<i>Parapholis incurva</i>	Curly Ryegrass														✓
<i>Paraserianthes lophantha</i>	Cape Leeuwin Wattle														✓
<i>Parentucellia latifolia</i>	Red Bartsia						6								✓
<i>Paspalum distichum</i>	Water Couch												E		✓
<i>Paspalum vaginatum</i>	Salt-water Couch														✓
<i>Pentameris pallida</i>	Pussy Tail					5									✓
<i>Petrorhagia dubia</i>	Velvet Pink														✓
<i>Phalaris aquatica</i>	Phalaris														✓
<i>Phalaris minor</i>	Lesser Canary-grass								8		10				✓
<i>Pinus radiata</i>	Radiata Pine														✓
<i>Plantago australis</i>	Southern Plantain					5									✓

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Plantago bellardii</i>	Hairy Plantain														✓
<i>Plantago coronopus ssp. commutata</i>	Bucks-horn Plantain														✓
<i>Plantago coronopus ssp. coronopus</i>	Bucks-horn Plantain												E		✓
<i>Plantago lanceolata var. dubia</i>	Ribwort														✓
<i>Plantago lanceolata var. lanceolata</i>	Ribwort						6	7							✓
<i>Poa annua</i>	Winter Grass														✓
<i>Poa bulbosa</i>	Bulbous Meadow-grass														✓
<i>Polycarpon tetraphyllum</i>	Four-leaf Allseed														✓
<i>Polygonum aviculare</i>	Wireweed														✓
<i>Polypogon maritimus</i>	Coast Beard-grass														✓
<i>Polypogon monspeliensis</i>	Annual Beard-grass	1		3									E		✓
<i>Polypogon viridis</i>	Water Bent														✓
<i>Ranunculus trilobus</i>	Three-lobed Buttercup														✓
<i>Reichardia tingitana</i>	False Sowthistle	1	2	3		5							E		✓
<i>Reseda lutea</i>	Cut-leaf Mignonette														✓
<i>Reseda luteola</i>	Wild Mignonette														✓
<i>Rhamnus alaternus</i>	Blowfly Bush					5									✓
<i>Romulea minutiflora</i>	Small-flower Onion-grass														✓
<i>Romulea rosea var. australis</i>	Common Onion-grass												E		✓
<i>Rorippa nasturtium-aquaticum</i>	Watercress														✓
<i>Rosa canina</i>	Dog Rose														✓
<i>Rostraria cristata</i>	Annual Cat's-tail														✓
<i>Rumex conglomeratus</i>	Clustered Dock														✓
<i>Rumex crispus</i>	Curled Dock														✓
<i>Rumex pulcher ssp. pulcher</i>	Fiddle Dock														✓
<i>Sagina maritima</i>	Sea Pearlwort														✓

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Salvia verbenaca</i> var. <i>verbenaca</i>	Wild Sage					5							11		✓
<i>Scabiosa atropurpurea</i>	Pincushion		2			5									✓
<i>Senecio pterophorus</i>	African Daisy	1										9	11		✓
<i>Senecio vulgaris</i>	Common Groundsel														✓
<i>Sherardia arvensis</i>	Field Madder														✓
<i>Silene gallica</i> var. <i>gallica</i>	French Catchfly														✓
<i>Silene nocturna</i>	Mediterranean Catchfly														✓
<i>Sisymbrium erysimoides</i>	Smooth Mustard														✓
<i>Solanum linnaeanum</i>	Apple Of Sodom					5								E	✓
<i>Solanum nigrum</i>	Black Nightshade														✓
<i>Sonchus asper</i> ssp. <i>asper</i>	Rough Sow-thistle														✓
<i>Sonchus oleraceus</i>	Common Sow-thistle														✓
<i>Sparaxis bulbifera</i>	Sparaxis													E	✓
<i>Sporobolus africanus</i>	Rat-tail Grass														✓
<i>Stachys arvensis</i>	Stagger Weed														✓
<i>Stellaria media</i>	Chickweed														✓
<i>Stenotaphrum secundatum</i>	Buffalo Grass														✓
<i>Thinopyrum junceiforme</i>	Sea Wheat-grass	1													✓
<i>Tribolium obliterum</i>															✓
<i>Trifolium angustifolium</i>	Narrow-leaf Clover							6		8					✓
<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot Clover					5									✓
<i>Trifolium campestre</i>	Hop Clover							6		8					✓
<i>Trifolium cherleri</i>	Cupped Clover														✓
<i>Trifolium dubium</i>	Suckling Clover														✓
<i>Trifolium glomeratum</i>	Cluster Clover														✓
<i>Trifolium scabrum</i>	Rough Clover														✓
<i>Trifolium sp.</i>	Clover													E	✓
<i>Trifolium subterraneum</i>	Subterranean Clover														✓
<i>Trifolium tomentosum</i>	Woolly Clover														✓

Name	Common_Name	BushRAT Assessment											Estuary	All ³⁰	
		1	2	3	4	5	6	7	8	9	10	11			
<i>Ulex europaeus</i>	Gorse														✓
<i>Urospermum picroides</i>	False Hawkbit														✓
<i>Ursinia anthemoides</i>															✓
<i>Urtica urens</i>	Small Nettle														✓
<i>Vellereophyton dealbatum</i>	White Cudweed														✓
<i>Verbascum virgatum</i>	Twiggy Mullein														✓
<i>Vicia monantha ssp. monantha</i>	One-flower Vetch														✓
<i>Vicia sativa ssp. nigra</i>	Narrow-leaf Vetch														✓
<i>Vicia sativa ssp. sativa</i>	Common Vetch														✓
<i>Vulpia bromoides</i>	Squirrel-tail Fescue														✓
<i>Vulpia sp.</i>	Sand Fescue	1	2	3	4		6	7	8	9	10	11			✓
<i>Vulpia muralis</i>	Wall Fescue														✓
<i>Vulpia myuros f. megalura</i>	Fox-tail Fescue												E		✓
<i>Zaluzianskya divaricata</i>	Spreading Night-phlox														✓

Name	Common Name	BushRAT Assessments					
		12	13	14	15	16	17
<i>Aira cupaniana</i>	Small Hair-grass						17
<i>Anagallis arvensis</i>	Pimpernel			14			
<i>Arctotheca calendula</i>	Cape Weed						17
<i>Asparagus asparagoides f. asparagoides</i>	Bridal Creeper	12			15	16	17
<i>Avena barbata</i>	Bearded Oat					16	
<i>Brassica tournefortii</i>	Wild Turnip		13				
<i>Bromus sp.</i>	Rigid Brome					16	
<i>Catapodium rigidum</i>	Rigid Fescue		13				
<i>Ehrharta calycina</i>	Perennial Veldt Grass		12				17
<i>Ehrharta longiflora</i>	Annual Veldt Grass		12	13		16	17
<i>Erodium botrys</i>	Long Heron's-bill		12				
<i>Erodium cicutarium</i>	Cut-leaf Heron's-bill		16				
<i>Galenia pubescens var. pubescens</i>	Coastal Galenia					16	
<i>Hypochaeris glabra</i>	Smooth Cat's Ear						17
<i>Hypochaeris radicata</i>	Rough Cat's Ear	12					
<i>Lagurus ovatus</i>	Hare's Tail Grass	12	13			16	17
<i>Lathyrus tingitanus</i>	Tangier Pea					16	
<i>Parentucellia latifolia</i>	Red Bartsia						17
<i>Petrorhagia dubia</i>	Velvet Pink		13	14			
<i>Plantago lanceolata var. lanceolata</i>	Ribwort	12					
<i>Polypogon monspeliensis</i>	Annual Beard-grass		13	14	15		
<i>Trifolium angustifolium</i>	Narrow-leaf Clover	12					
<i>Trifolium arvense var. arvense</i>	Hare's-foot Clover						17
<i>Trifolium campestre</i>	Hop Clover						17
<i>Vicia sativa ssp. sativa</i>	Common Vetch		13		15		
<i>Vulpia sp.</i>	Sand Fescue	12	13		15	16	17

Appendix 2: Bird species list

Newland Head CP Bird Species List

(List compiled from several sources, including Southern Fleurieu Coastal Action Plan and the Australian Living Atlas (within a 5km radius))

Species	Common Name	#Conservation Status		
		EPBC	SA	MLR
<i>Pachyptila desolata</i>	Antarctic Prion			
<i>Stercorarius parasiticus</i>	Arctic Jaeger			
<i>Sterna paradisaea</i>	Arctic Tern			
<i>Anhinga novaehollandiae</i>	Australasian Darter			VU
<i>Morus serrator</i>	Australasian Gannet			
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe			LC
<i>Anthus novaeseelandiae</i>	Australasian Pipit			RA
<i>Anas rhynchos</i>	Australasian Shoveler		R	RA
<i>Falco longipennis</i>	Australian Hobby			LC
<i>Cracticus tibicen</i>	Australian Magpie			LC
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar			RA
<i>Pelecanus conspicillatus</i>	Australian Pelican			RA
<i>Corvus coronoides</i>	Australian Raven			
<i>Acrocephalus australis</i>	Australian Reed-warbler			LC
<i>Tadorna tadornoides</i>	Australian Shelduck			VU
<i>Porzana fluminea</i>	Australian Spotted Crake			RA
<i>Threskiornis molucca</i>	Australian White Ibis			LC
<i>Chenonetta jubata</i>	Australian Wood Duck			
<i>Porzana pusilla</i>	Baillon's Crake			VU
<i>Zoothera lunulata</i>	Bassian Thrush		R	EN
<i>Stagonopleura bella</i>	Beautiful Firetail		R	CR
<i>Cygnus atratus</i>	Black Swan			RA
<i>Thalassarche melanophris</i>	Black-browed Albatross		V	VU
<i>Phalacrocorax fuscescens</i>	Black-faced Cormorant			RA
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike			LC
<i>Euseyornis melanops</i>	Black-fronted Dotterel			RA
<i>Elanus axillaris</i>	Black-shouldered Kite			LC
<i>Tribonyx ventralis</i>	Black-tailed Native-hen			LC
<i>Himantopus himantopus</i>	Black-winged Stilt			VU
<i>Halobaena caerulea</i>	Blue Petrel			
<i>Oxyura australis</i>	Blue-billed Duck			VU
<i>Neophema chrysostoma</i>	Blue-winged Parrot		V	VU
<i>Pachyptila vittata</i>	Broad-billed Prion			
<i>Falco berigora</i>	Brown Falcon			LC
<i>Accipiter fasciatus</i>	Brown Goshawk		R	LC
<i>Stercorarius antarcticus</i>	Brown Skua			
<i>Cincloramphus cruralis</i>	Brown Songlark			RA
<i>Acanthiza pusilla</i>	Brown Thornbill			VU
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater			NT
<i>Phaps elegans</i>	Brush Bronzewing			RA

Species	Common Name	#Conservation Status		
		EPBC	SA	MLR
<i>Gallirallus philippensis</i>	Buff-banded Rail			RA
<i>Acanthiza reguloides</i>	Buff-rumped Thornbill			NT
<i>Thalassarche bulleri</i>	Buller's Albatross		V	
<i>Cereopsis novaehollandiae</i>	Cape Barren Goose		R	RA
<i>Daption capense</i>	Cape Petrel			
<i>Hydroprogne caspia</i>	Caspian Tern			VU
<i>Ardea ibis</i>	Cattle Egret		R	VU
<i>Anas castanea</i>	Chestnut Teal			
<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren	EN	E	EN
<i>Nymphicus hollandicus</i>	Cockatiel			RA
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk			LC
* <i>Turdus merula</i>	Common Blackbird			
<i>Phaps chalcoptera</i>	Common Bronzewing			LC
<i>Pelecanoides urinatrix</i>	Common Diving-petrel			
* <i>Chloris chloris</i>	Common Greenfinch			
<i>Tringa nebularia</i>	Common Greenshank			VU
<i>Actitis hypoleucos</i>	Common Sandpiper		R	EN
* <i>Sturnus vulgaris</i>	Common Starling			
<i>Phylidonyris pyrrhoptera</i>	Crescent Honeyeater			LC
<i>Ocyphaps lophotes</i>	Crested Pigeon			LC
<i>Thalasseus bergii</i>	Crested Tern			
<i>Platycercus elegans</i>	Crimson Rosella			LC
<i>Stagonopleura guttata</i>	Diamond Firetail		V	EN
<i>Gallinula tenebrosa</i>	Dusky Moorhen			LC
<i>Artamus cyanopterus</i>	Dusky Woodswallow			RA
<i>Numenius madagascariensis</i>	Eastern Curlew		V	
<i>Ardea modesta</i>	Eastern Great Egret			
<i>Pandion cristatus</i>	Eastern Osprey			
<i>Egretta sacra</i>	Eastern Reef Egret	M	R	CR
<i>Platycercus eximius</i>	Eastern Rosella			LC
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill			LC
<i>Neophema elegans</i>	Elegant Parrot		R	VU
<i>Dromaius novaehollandiae</i>	Emu			VU
<i>Fulica atra</i>	Eurasian Coot			LC
* <i>Alauda arvensis</i>	Eurasian Skylark			
<i>Carduelis carduelis</i>	European Goldfinch			
<i>Petrochelidon ariel</i>	Fairy Martin			RA
<i>Pachyptila turtur</i>	Fairy Prion			
<i>Sternula nereis</i>	Fairy Tern	VU	E	CR
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo			NT
<i>Petroica phoenicea</i>	Flame Robin		V	CR
<i>Ardenna carneipes</i>	Flesh-footed Shearwater		R	

Species	Common Name	#Conservation Status		
		EPBC	SA	MLR
<i>Puffinus gavia</i>	Fluttering Shearwater			
<i>Apus pacificus</i>	Fork-tailed Swift			RA
<i>Eolophus roseicapillus</i>	Galah			LC
<i>Plegadis falcinellus</i>	Glossy Ibis		R	RA
<i>Pachycephala pectoralis</i>	Golden Whistler			LC
<i>Cisticola exilis</i>	Golden-headed Cisticola			VU
<i>Phalacrocorax carbo</i>	Great Cormorant			RA
<i>Pterodroma macroptera</i>	Great-winged Petrel			
<i>Cracticus torquatus</i>	Grey Butcherbird			VU
<i>Strepera versicolor</i>	Grey Currawong			LC
<i>Rhipidura albiscapa</i>	Grey Fantail			LC
<i>Colluricincla harmonica</i>	Grey Shrike-thrush			LC
<i>Anas gracilis</i>	Grey Teal			LC
<i>Thalassarche chrysostoma</i>	Grey-headed Albatross		V	
<i>Gelochelidon nilotica</i>	Gull-billed Tern			
<i>Aythya australis</i>	Hardhead			LC
<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe			NT
<i>Thinornis rubricollis</i>	Hooded Plover		V	EN
<i>Melanodryas cucullata</i>	Hooded Robin		R	CT
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-cuckoo			NT
* <i>Passer domesticus</i>	House Sparrow			
<i>Puffinus huttoni</i>	Hutton's Shearwater			
<i>Microeca fascinans</i>	Jacky Winter		R	CR
<i>Larus dominicanus</i>	Kelp Gull		R	RA
<i>Dacelo novaeguineae</i>	Laughing Kookaburra			LC
<i>Phoebastria palpebrata</i>	Light-mantled Sooty Albatross		E	
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant			LC
<i>Cacatua sanguinea</i>	Little Corella			LC
<i>Hieraaetus morphnoides</i>	Little Eagle			EN
<i>Megalurus gramineus</i>	Little Grassbird			LC
<i>Eudyptula minor</i>	Little Penguin			
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant			LC
<i>Corvus mellori</i>	Little Raven			LC
<i>Anthochaerachrysoptera</i>	Little Wattlebird			LC
<i>Stercorarius longicaudus</i>	Long-tailed Jaeger			
<i>Grallina cyanoleuca</i>	Magpie-lark			LC
<i>Vanellus miles</i>	Masked Lapwing			LC
<i>Dicaeum hirundinaceum</i>	Mistletoebird			LC
<i>Psephotus varius</i>	Mulga Parrot			
<i>Biziura lobata</i>	Musk Duck		R	VU
<i>Glossopsitta concinna</i>	Musk Lorikeet			LC
<i>Falcocenchroides</i>	Nankeen Kestrel			LC

Species	Common Name	#Conservation Status		
		EPBC	SA	MLR
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater			LC
<i>Macronectes halli</i>	Northern Giant-petrel			
<i>Anas superciliosa</i>	Pacific Black Duck			VU
<i>Larus pacificus</i>	Pacific Gull			VU
<i>Turnix varius</i>	Painted Button-quail		R	VU
<i>Cacomantis pallidus</i>	Pallid Cuckoo			RA
<i>Geopelia striata</i>	Peaceful Dove			VU
<i>Falco peregrinus</i>	Peregrine Falcon		R	RA
<i>Phalacrocorax varius</i>	Pied Cormorant			LC
<i>Petroica rodinogaster</i>	Pink Robin			
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck			RA
<i>Stercorarius pomarinus</i>	Pomarine Jaeger			
<i>Porphyrio porphyrio</i>	Purple Swamphen			LC
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet			NT
<i>Lichenostomus cratitius</i>	Purple-gaped Honeyeater		R	
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet			LC
<i>Anthochaera carunculata</i>	Red Wattlebird			LC
<i>Neochmia temporalis</i>	Red-browed Finch			NT
<i>Charadrius ruficapillus</i>	Red-capped Plover			EN
<i>Petroica goodenovii</i>	Red-capped Robin			RA
<i>Erythronyx cinctus</i>	Red-kneed Dotterel			VU
<i>Calidris ruficollis</i>	Red-necked Stint			VU
<i>Psephotus haematonotus</i>	Red-rumped Parrot			NT
<i>Myiagra inquieta</i>	Restless Flycatcher		R	CR
* <i>Columba livia</i>	Rock Dove			
<i>Neophema petrophila</i>	Rock Parrot		R	
<i>Diomedea epomophora</i>	Royal Albatross			
<i>Pachycephala rufiventris</i>	Rufous Whistler			NT
<i>Todiramphus sanctus</i>	Sacred Kingfisher			NT
<i>Calidris alba</i>	Sanderling	M	R	
<i>Petroica boodang</i>	Scarlet Robin		R	VU
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper			VU
<i>Chrysococcyx lucidus</i>	Shining Bronze-cuckoo			RA
<i>Ardenna tenuirostris</i>	Short-tailed Shearwater			
<i>Thalassarche cauta</i>	Shy Albatross		V	
<i>Chroicocephalus novaehollandiae</i>	Silver Gull			LC
<i>Zosterops lateralis</i>	Silvereye			VU
<i>Gavicalis virescens</i>	Singing Honeyeater			LC
<i>Pachyptila belcheri</i>	Slender-billed Prion			
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher		R	EN
<i>Stercorarius maccormicki</i>	South Polar Skua			
<i>Ninox novaeseelandiae</i>	Southern Boobook			NT

Species	Common Name	#Conservation Status		
		EPBC	SA	MLR
<i>Fulmarus glacialis</i>	Southern Fulmar			
<i>Macronectes giganteus</i>	Southern Giant-petrel	E	V	
<i>Drymodes brunneopygia</i>	Southern Scrub-robin			
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater			RA
<i>Porzana abuenensis</i>	Spotless Crake		R	EN
<i>Streptopelia chinensis</i>	Spotted Dove			
<i>Eurostopodus argus</i>	Spotted Nightjar			RA
<i>Pardalotus punctatus</i>	Spotted Pardalote			NT
<i>Threskiornis spinicollis</i>	Straw-necked Ibis			NT
<i>Pardalotus striatus</i>	Striated Pardalote			LC
<i>Acanthiza lineata</i>	Striated Thornbill			LC
<i>Coturnix pectoralis</i>	Stubble Quail			NT
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			LC
<i>Malurus cyaneus</i>	Superb Fairy-wren			LC
<i>Circus approximans</i>	Swamp Harrier			VU
<i>Podargus strigoides</i>	Tawny Frogmouth			NT
<i>Gliciphila melanops</i>	Tawny-crowned Honeyeater			EN
<i>Petrochelidon nigricans</i>	Tree Martin			NT
<i>Daphoenositta chrysoptera</i>	Varied Sittella			VU
<i>Diomedea exulans</i>	Wandering Albatross	V	V	
<i>Aquila audax</i>	Wedge-tailed Eagle			LC
<i>Smicronis brevirostris</i>	Weebill			LC
<i>Hirundo neoxena</i>	Welcome Swallow			LC
<i>Haliastur sphenurus</i>	Whistling Kite			EN
<i>Cheramoeca leucosterna</i>	White-backed Swallow			
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle		E	EN
<i>Pomatostomus superciliosus</i>	White-browed Babbler			EN
<i>Sericornis frontalis</i>	White-browed Scrubwren			LC
<i>Egretta novaehollandiae</i>	White-faced Heron			LC
<i>Epthianura albifrons</i>	White-fronted Chat			VU
<i>Sterna striata</i>	White-fronted Tern			
<i>Pterodroma lessonii</i>	White-headed Petrel			
<i>Melithreptus lunatus</i>	White-naped Honeyeater			VU
<i>Ardea pacifica</i>	White-necked Heron			VU
<i>Ptilotula penicillatus</i>	White-plumed Honeyeater			LC
<i>Cormobates leucophaea</i>	White-throated Treecreeper			NT
<i>Chlidonias leucopterus</i>	White-winged Black Tern			
<i>Lalage sueurii</i>	White-winged Triller			RA
<i>Rhipidura leucophrys</i>	Willie Wagtail			NT
<i>Oceanites oceanicus</i>	Wilson's Storm-petrel			
<i>Acanthiza nana</i>	Yellow Thornbill			NT
<i>Platalea flavipes</i>	Yellow-billed Spoonbill			VU

Species	Common Name	#Conservation Status		
		EPBC	SA	MLR
Caligavis chrysops	Yellow-faced Honeyeater			LC
Thalassarche chlororhynchos	Yellow-nosed Albatross		E	
Ptilotula ornatus	Yellow-plumed Honeyeater			RA
Acanthiza chrysorrhoa	Yellow-rumped Thornbill			NT
Calyptorhynchus funereus	Yellow-tailed Black-cockatoo		V	VU
Manorina flavigula	Yellow-throated Miner			

*Denotes introduced species

#Conservation Status

AUS = Australia EPBC Act 1999: CR = Critically Endangered, EN = Endangered, VU = Vulnerable

SA = South Australia NPW Act 1972: E = Endangered, V = Vulnerable, R = Rare

AMLR = Adelaide and Mount Lofty Botanical Region:³¹ CR = Critically Endangered, EN=Endangered, VU=Vulnerable, RA=Rare, NT = Near Threatened

³¹ Definitions based on regional ratings obtained from Lang, P.J. & Kraehenbuehl, D.N. (2008). *Plants of Particular Conservation Significance in South Australia's Agricultural Regions*. July 2008 update of unpublished database. Department for Environment and Heritage.

Appendix 3: BushRAT monitoring data

It is not the intent of this report to provide an extensive overview of the use and application of the BushRAT methodology. A full description of the method and its application can be found within DEWNR (2012)³². The following is a simple overview of the contribution of different scoring components to the BushRAT overall score. Note: A low score indicates poor condition for that attribute, a high score indicates good condition. Thus a very high weed score means there are very few weeds, and a very low weed score means there is a profusion of threatening weeds.

Vegetation Condition Scores (/80)

Vegetation condition component	Overview description
Native Plant Species Diversity (15)	A count of the number of species present is compared to a “benchmark” value for that vegetation type. This is then allocated a score from 0-15.
Weed Score (15)	The cover and abundance of all weed species present is recorded. The 5 weeds with the highest product of threat rating and cover are summed to provide a score. This is then compared to a “benchmark” value for that vegetation type, and allocated a score from 0-15.
Native Plant Life Forms (10)	The cover of different native plant life forms is compared to a “benchmark” value for that vegetation type. This is then allocated a score from 0-10.
Regeneration (8)	The total number of woody native species in juvenile or seedling form is recorded and compared to a “benchmark” value for that vegetation type. This is then allocated a score from 0-8.
Native:exotic Understorey Biomass (10)	The percentage of the total <i>vegetative biomass</i> of shrubs and groundcover plants < 2m high that is native is noted. This is then allocated a score from 0-10.
Bare Ground (3)	The percentage of the grounds surface that is truly bare is noted and allocated a score from 0-3.
Tree Health (5)	Average overall overstorey canopy health is allocated to a category, and then a score from 0-5. NOTE: NOT SCORED FOR COASTAL SHRUBLAND VEGETATION.
Tree Hollows (5)	This score relates to the number of small and large tree hollows present, with a rating of 0-5. NOTE: NOT SCORED FOR COASTAL SHRUBLAND VEGETATION.
Fallen timber (5)	This score relates to the amount of branch and trunk sized logs present, with a rating of 0-5. NOTE: NOT SCORED FOR COASTAL SHRUBLAND VEGETATION.
Grazing Evidence (4)	This score relates to evidence of grazing pressure, including pugging, compacting and chewing. The score is from 0-4.

³² DEWNR (2012) NVBMU BushRAT assessment and scoring Manual. Unpublished document, Department for Environment, Water and Natural Resources, Waite.

BushRAT Site 1: *Olearia axillaris* +/- *Acacia longifolia* ssp. *sophorae* +/- *Leucopogon parviflorus* Shrubland

Management Unit: 1 Parsons Beach dunes and foredunes **Date of assessment:** 2/12/2015

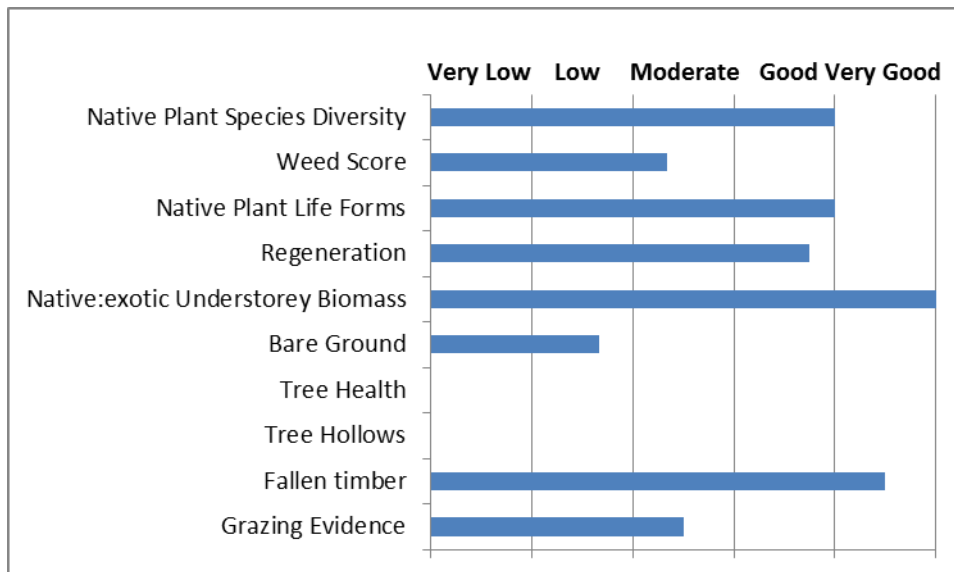
GPS Location of Photograph: 271172 6054048 **Direction:** SW

Benchmark Vegetation Community Type: SMLR Co Community 7.2 - Coastal Shrublands and Tall Shrublands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT score sheet

SITE: 1 Parsons Beach dunes	
DESCRIPTION: Olearia axillaris +/- Acacia sophorae +/- Leucopogon parviflorus Shrubland	
VEGETATION CONDITION SCORE (max. in brackets)	score
Native Plant Species Diversity (15)	12
Weed Score (15)	7
Native Plant Life Forms (10)	8
Regeneration (8)	6
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	1
Tree Health (5)	0
Tree Hollows (5)	0
Fallen timber (5)	4.5
Grazing Evidence (4)	2
TOTAL (ADD UP ALL POINTS)	50.5
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	62.1

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Centaurea melitensis</i>	1	2	2
<i>Asparagus asparagoides</i>	2	5	10
<i>Lthyrus tingitanus</i>	1	2	2
<i>Euphorbia terracina</i>	1	3	3
<i>Reichardia tingitana</i>	1	2	2
Total Cover x Threat Invasion			19

BushRAT Site 2: +/- *Leucophyta brownii* +/- *Lomandra effusa* Low Open Shrubland with emergent *Leucopogon parviflorus*, *Acacia longifolia* ssp. *sophorae*, *Rhagodia candolleana*

Management Unit: 3 Parsons Beach clifftops **Date of assessment:** 2/12/2015

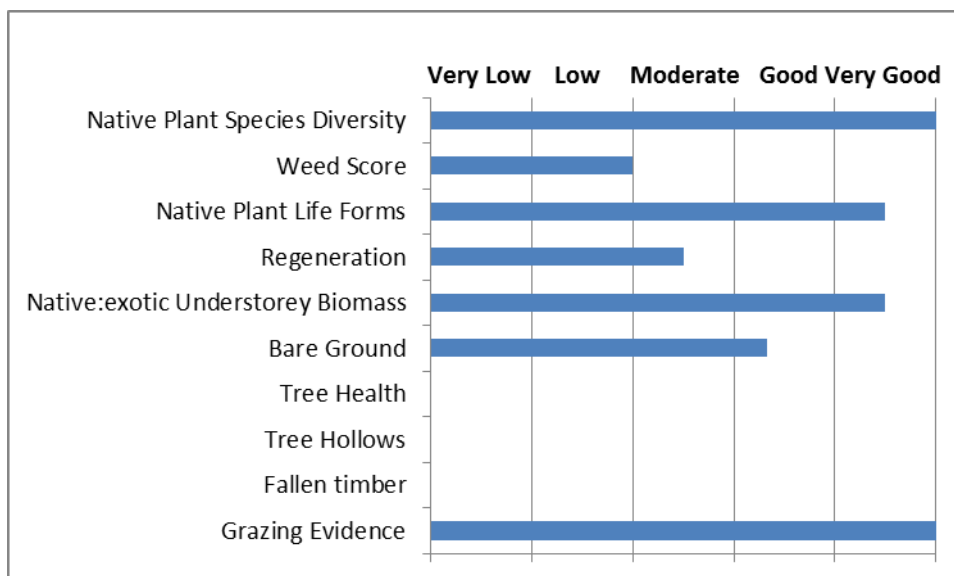
GPS Location of Photograph: 271401 6052803 **Direction:** N

Benchmark Vegetation Community Type: SMLR Co Community 7.4 - Coastal Cliff Low Shrublands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT score sheet

SITE 2: Clifftop Heath, Parsons Beach	
DESCRIPTION: +/- <i>Leucophyta brownii</i> +/- <i>Lomandra effusa</i> Low Open Shrubland with emergent <i>Leucopogon parviflorus</i> , <i>Acacia sophorae</i> , <i>Rhagodia candolleana</i>	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	15
Weed Score (15)	6
Native Plant Life Forms (10)	9
Regeneration (8)	4
Native:exotic Understorey Biomass (10)	9
Bare Ground (3)	2
Tree Health (5)	0
Tree Hollows (5)	0
Fallen timber (5)	0
Grazing Evidence (4)	4
TOTAL (ADD UP ALL POINTS)	49
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	60.27

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Leptosperum laevigatum</i>	1	4	4
<i>Asparagus asparagoides</i>	1	5	5
<i>Ehrharta longiflora</i>	1	2	2
<i>Scabiosa atropurpurea</i>	1	2	2
<i>Reichardia tingitana</i>	1	2	2
		Total Cover x Threat Invasion	15

BushRAT Site 3: *Leucopogon parviflorus* +/- *Eucalyptus diversifolia* +/- *Acacia sophorae* +/- *Olearia axillaris* Shrubland

Management Unit: 4 Back dunes **Date of assessment:** 2/12/2015

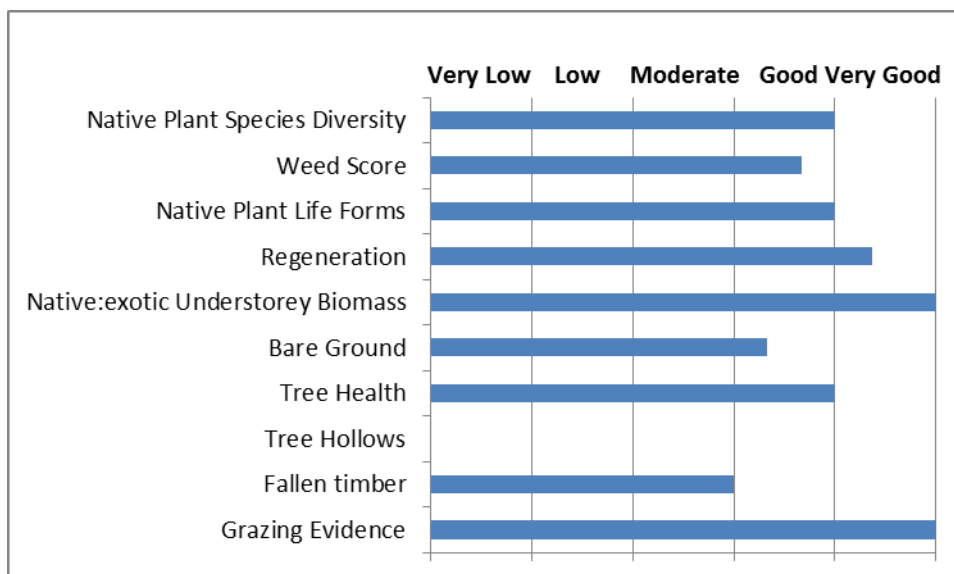
GPS Location of Photograph: 271465 6053853 **Direction:** SW

Benchmark Vegetation Community Type: SMLR Co Community 7.2 - Coastal Shrublands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 3: Dune Slope, Parsons Beach	
DESCRIPTION: Leucopogon parviflorus +/- Eucalyptus diversifolia +/- Acacia sophorae +/- Olearia axillaris Shrubland	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	13
Weed Score (15)	11
Native Plant Life Forms (10)	8
Regeneration (8)	7
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	2
Tree Health (5)	4
Tree Hollows (5)	0
Fallen timber (5)	3
Grazing Evidence (4)	4
TOTAL (ADD UP ALL POINTS)	62
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	76.26

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)
<i>Cakile maritima</i>	1	2
<i>Limonium companyonis</i>	1	2
<i>Lagurus ovatus</i>	1	2
<i>Polypogon</i>	1	2
<i>Reichardia tingitana</i>	1	2
		Total Cover x Threat Invasion

Site 4: *Eucalyptus diversifolia* +/- *E. fasciculosa* +/- *E. cosmophylla* Low Forest

Management Unit: 5 Parsons Low Forest/Mallee **Date of assessment:** 2/12/2015

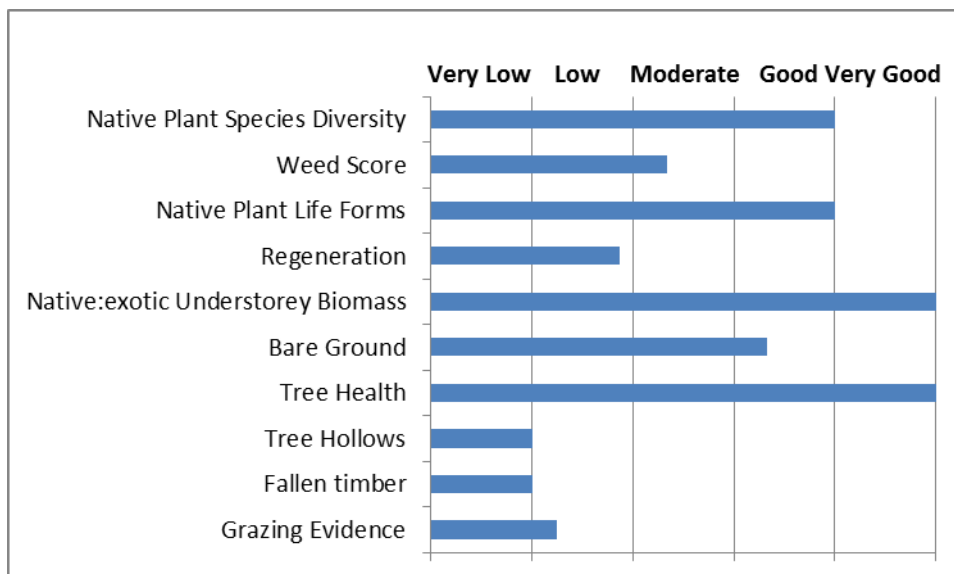
GPS Location of Photograph: 271823 6054408 **Direction:** SE

Benchmark Vegetation Community Type: SMLR 1.2 - Coastal Very Low Woodlands with heath understorey

Site photograph:



Scores for individual BushRAT components:



BushRAT Scoresheet:

SITE 4: Parsons Beach	
DESCRIPTION: Eucalyptus diversifolia +/- E. fasciculosa +/- E. cosmophylla Low Forest	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	13
Weed Score (15)	7
Native Plant Life Forms (10)	8
Regeneration (8)	3
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	2
Tree Health (5)	5
Tree Hollows (5)	1
Fallen timber (5)	1
Grazing Evidence (4)	1
TOTAL (ADD UP ALL POINTS)	51
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	51

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Chrysanthemoides monilifera</i>	1	3	3
<i>Vulpia sp.</i>	1	2	2
<i>Aira sp.</i>	1	1	1
<i>Hypochaeris glabra</i>	1	1	1
<i>Asparagus asparagoides</i>	2	5	10
		Total Cover x Threat Invasion	17

BushRAT Site 5: *Eucalyptus fasciculosa* +/- *Allocasuarina verticillata* +/- *E. leucoxylon* Woodlands

Management Unit: 6 Parsons Beach woodland **Date of assessment:** 2/12/2015

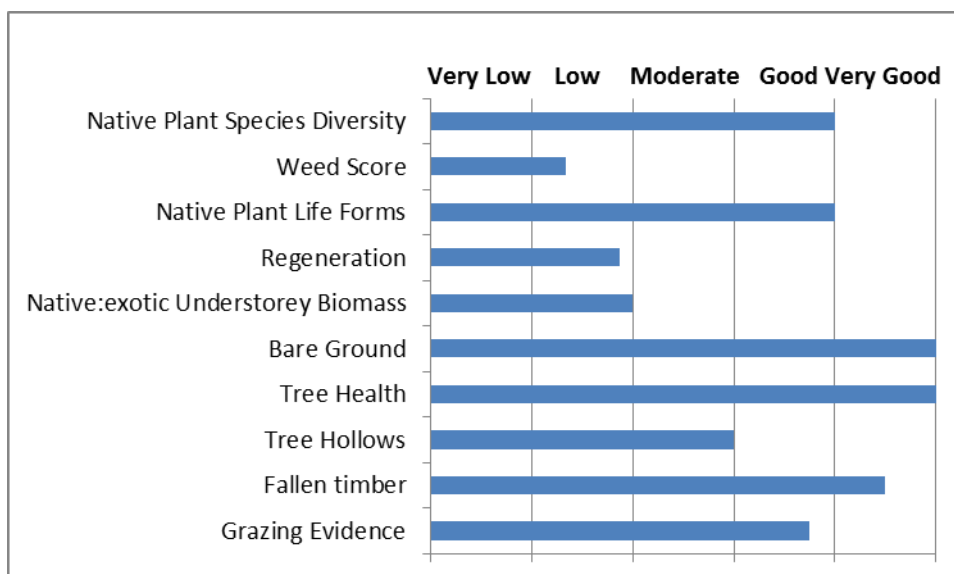
GPS Location of Photograph: 271793 6055134 **Direction:** S

Benchmark Vegetation Community Type: SMLR 2 - Forests and Woodlands with an open sclerophyll shrub understorey

Site photograph:



Scores for individual BushRAT components:



BushRAT Scoresheet:

SITE 5: Parsons Beach	
DESCRIPTION: Eucalyptus fasciculosa +/- Allocasuarina verticillata +/- E. leucoxylon Woodland	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	12
Weed Score (15)	4
Native Plant Life Forms (10)	8
Regeneration (8)	3
Native:exotic Understorey Biomass (10)	4
Bare Ground (3)	3
Tree Health (5)	5
Tree Hollows (5)	3
Fallen timber (5)	4.5
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	49.5
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	49.5

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta longiflora</i>	2	2	4
<i>Rhamnus alaternus</i>	1	3	3
<i>Solanum linnaeanum</i>	1	3	3
<i>Asparagus asparagoides</i>	3	5	15
<i>Pentameris pallida</i>	2	3	6
		Total Cover x Threat Invasion	31

BushRAT Site 6: *Cassinia complanata*, *Eucalyptus cosmophylla*, *E. diversifolia* Low Shrubland

Management Unit: 14 Newland Head and Witpinga Cliffs clifftops and cliff-faces

Date of assessment: 8/12/2015

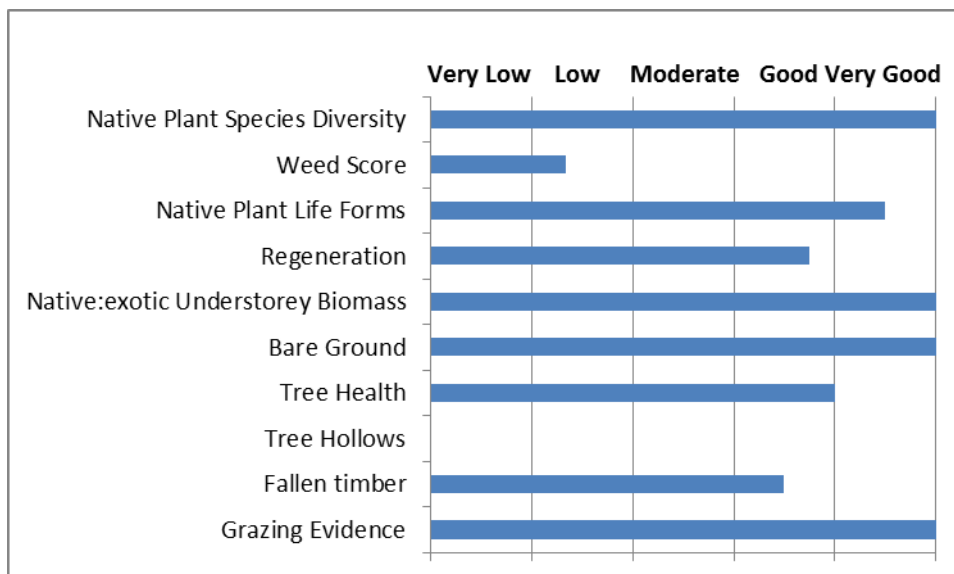
GPS Location of Photograph: 279212 6056624 **Direction:** ENE

Benchmark Vegetation Community Type: SMLR Co 7.4 Coastal Cliff Low Shrublands and Very Low Open Woodlands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT score sheet

SITE 6: Waitpinga cliff top and cliff face heath	
DESCRIPTION: Cassinia complanata, Eucalyptus cosmophylla, E. diversifolia Low Shrubland	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	15
Weed Score (15)	4
Native Plant Life Forms (10)	9
Regeneration (8)	6
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	3
Tree Health (5)	4
Tree Hollows (5)	0
Fallen timber (5)	3.5
Grazing Evidence (4)	4
TOTAL (ADD UP ALL POINTS)	58.5
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	58.5

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta longiflora</i>	1	2	2
<i>Disa bracteata</i>	1	3	3
<i>Ehrharta calycina</i>	2	4	8
<i>Asparagus asparagoides</i>	1	5	5
<i>Plantago lanceolata</i>	1	2	2
		Total Cover x Threat Invasion	20

BushRAT Site 7: *Eucalyptus fasciculosa*, *E. cosmophylla* Low Woodland

Management Unit: 9 Intact scrub areas of Secion 1380 and extending along the Waitpinga Cliffs

Date of assessment: 8/12/2015

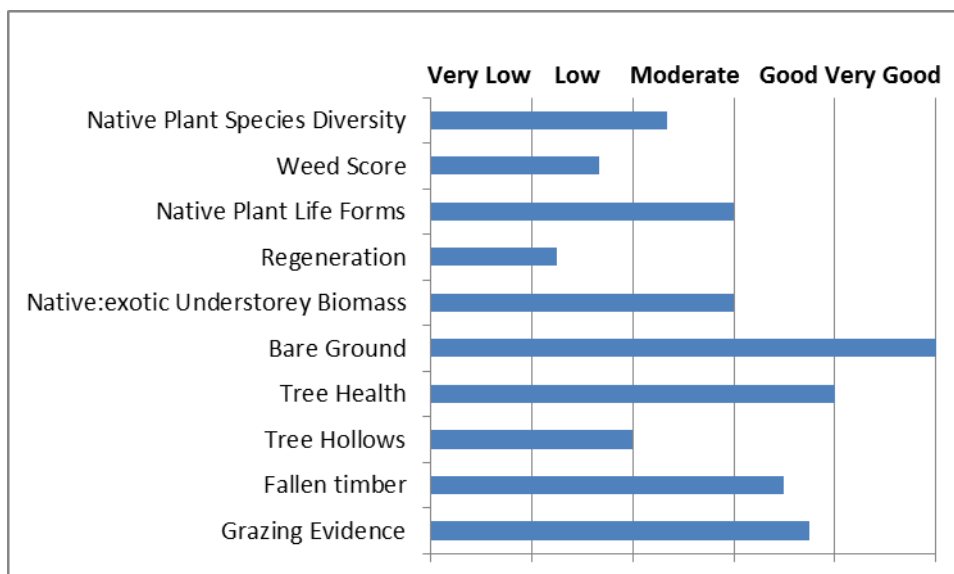
GPS Location of Photograph: 279370 6056766 **Direction:** W

Benchmark Vegetation Community Type: SMLR 1.2 - Coastal Very Low Woodlands with heath understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT score sheet

SITE 7: Waitpinga	
DESCRIPTION: Eucalyptus fasciculosa, E. cosmophylla Low Woodland	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	7
Weed Score (15)	5
Native Plant Life Forms (10)	6
Regeneration (8)	2
Native:exotic Understorey Biomass (10)	6
Bare Ground (3)	3
Tree Health (5)	4
Tree Hollows (5)	2
Fallen timber (5)	3.5
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	41.5
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	41.5

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta longiflora</i>	2	2	4
<i>Briza maxima</i>	2	2	4
<i>Ehrharta calycina</i>	2	4	8
<i>Asparagus asparagoides</i>	1	5	5
<i>Plantago lanceolata</i>	1	2	2
		Total Cover x Threat Invasion	23

BushRAT Site 8: *Eucalyptus cosmophylla* +/- *E. fasciculosa* Low Open Woodland (revegetation)

Management Unit: 15 Lot 22 Revegetation block, fenced revegetation block NE corner of Sn 1381 and 'Firetail Haven' **Date of assessment:** 8/12/2015

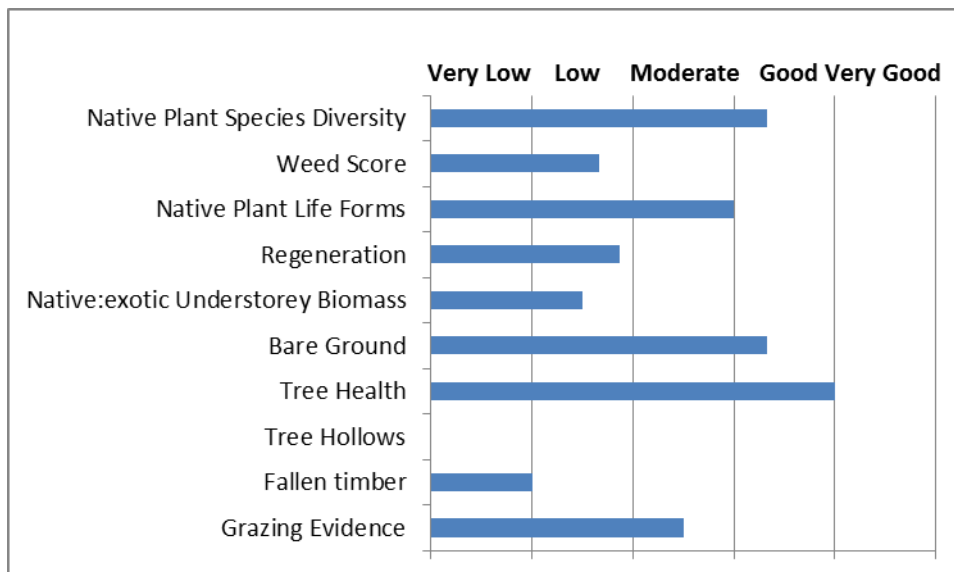
GPS Location of Photograph: 279811 6057085 **Direction:** NW

Benchmark Vegetation Community Type: SMLR 1.2 - Coastal Very Low Woodlands with heath understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 8: Waitpinga	
DESCRIPTION: Eucalyptus cosmophylla +/- E. fasciculosa Low Open Woodland (revegetation)	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	11
Weed Score (15)	5
Native Plant Life Forms (10)	6
Regeneration (8)	3
Native:exotic Understorey Biomass (10)	3
Bare Ground (3)	2
Tree Health (5)	4
Tree Hollows (5)	0
Fallen timber (5)	1
Grazing Evidence (4)	2
TOTAL (ADD UP ALL POINTS)	37
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	37

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Asparagus asparagoides</i>	1	5	5
<i>Avena barbata</i>	2	2	4
<i>Ehrharta calycina</i>	2	4	8
<i>Briza maxima</i>	2	2	4
<i>Disa bracteata</i>	1	3	3
		Total Cover x Threat Invasion	24

BushRAT Site 9: *Eucalyptus diversifolia* +/- *E. cosmophylla* +/- *E. fasciculosa* +/- *Melaleuca lanceolata* Mallee

Management Unit: 9 Intact scrub areas of Secion 1380 and extending along the Waitpinga Cliffs and 11 Intact scrub areas north of the track in Section 1380

Date of assessment: 8/12/2015

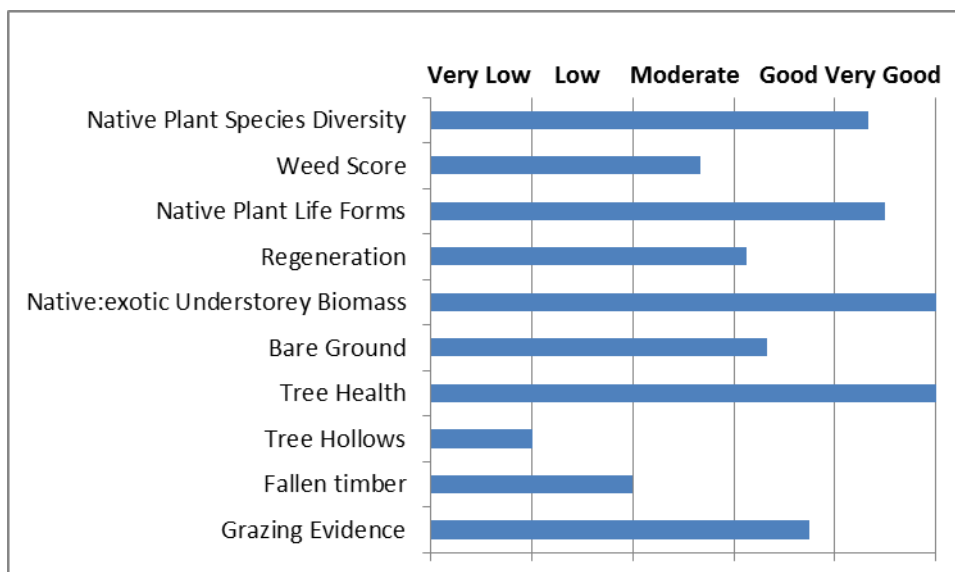
GPS Location of Photograph: 277114 6054633 **Direction:** SE

Benchmark Vegetation Community Type: SMLR 1.2 - Coastal Very Low Woodlands with heath understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 9: Newland Head CP	
DESCRIPTION: Eucalyptus diversifolia +/- E. cosmophylla +/- E. fasciculosa +/- Melaleuca lanceolata Mallee	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	13
Weed Score (15)	8
Native Plant Life Forms (10)	9
Regeneration (8)	5
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	2
Tree Health (5)	5
Tree Hollows (5)	1
Fallen timber (5)	2
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	58
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	58

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta longiflora</i>	1	2	2
<i>Asparagus asparagoides</i>	2	5	10
<i>Vulpia sp.</i>	1	2	2
<i>Aira sp.</i>	1	1	1
			0
Total Cover x Threat Invasion			15

BushRAT Site 10: *Ehrharta calycina*, *Phalaris* sp. Grassland with emergent *Eucalyptus diversifolia*, *Acacia pycnantha*, *Allocasuarina verticillata*, *Xanthorrhoea semiplana*

Management Unit: 13 “Rehabilitation” areas of Sn 1380 **Date of assessment:** 8/12/2015

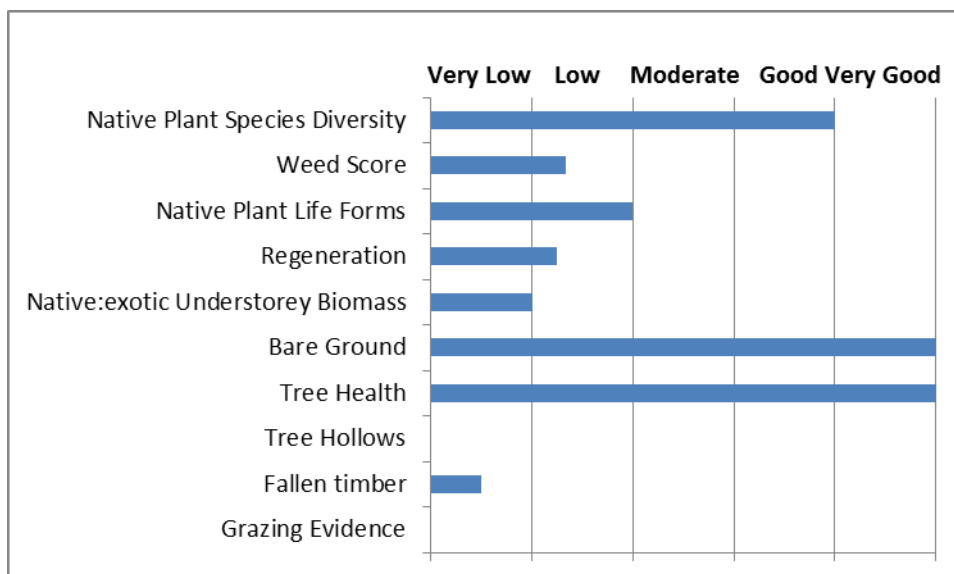
GPS Location of Photograph: 276109 6056632 **Direction:** WSW

Benchmark Vegetation Community Type: SMLR Co 2 - Forests and Woodlands with an Open Sclerophyll Shrub Understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 10: Newland Head CP	
DESCRIPTION: Ehrharta calycina, Phalaris sp. Grassland with emergent Eucalyptus diversifolia, Acacia pycnantha, Allocasuarina verticillata, Xanthorrhoea semiplana	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	12
Weed Score (15)	4
Native Plant Life Forms (10)	4
Regeneration (8)	2
Native:exotic Understorey Biomass (10)	2
Bare Ground (3)	3
Tree Health (5)	5
Tree Hollows (5)	0
Fallen timber (5)	0.5
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	35.5
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	35.5

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta calycina</i>	3	4	12
<i>Asparagus asparagoides</i>	2	5	10
<i>Vulpia sp.</i>	2	2	4
<i>Disa bracteata</i>	1	3	3
<i>Arctotheca calendula</i>	2	2	4
		Total Cover x Threat Invasion	33

BushRAT Site 11: *Eucalyptus baxteri*, *E. diversifolia* +/- *E. fasciculosa* Woodland

Management Unit: 8 Intact scrub areas of Secions 1381, 399 and 400 **Date of assessment:** 8/12/2015

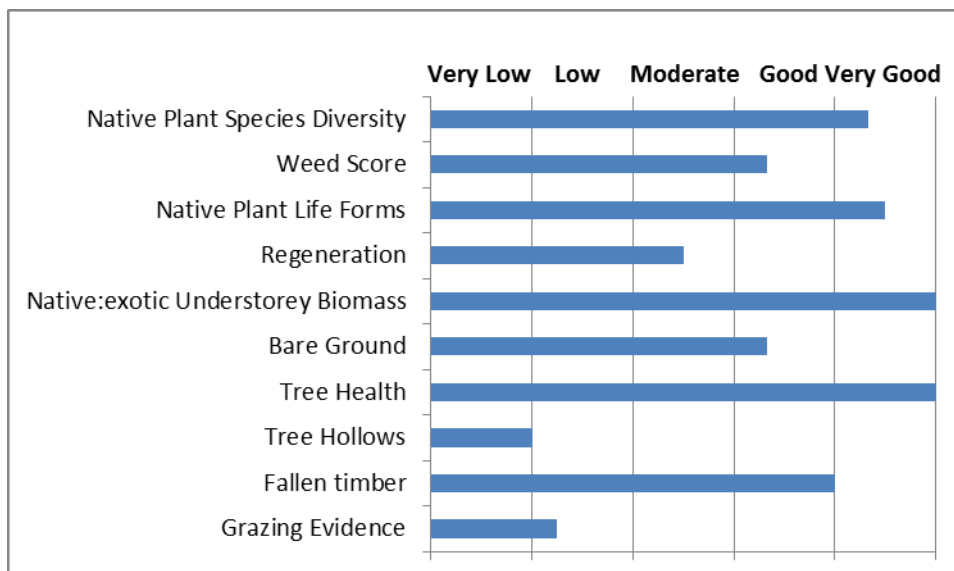
GPS Location of Photograph: 274902 6056105 **Direction:** SE

Benchmark Vegetation Community Type: SMLR Co 2 - Forests and Woodlands with an Open Sclerophyll Shrub Understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 11: Newland Head CP	
DESCRIPTION: Eucalyptus baxteri, E. diversifolia +/- E. fasciculosa Woodland	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	13
Weed Score (15)	10
Native Plant Life Forms (10)	9
Regeneration (8)	4
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	2
Tree Health (5)	5
Tree Hollows (5)	1
Fallen timber (5)	4
Grazing Evidence (4)	1
TOTAL (ADD UP ALL POINTS)	59
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	59

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta calycina</i>	1	4	4
<i>Senecio pterophorus</i>	1	3	3
<i>Disa bracteata</i>	1	3	3
<i>Ehrharta longiflora</i>	1	2	2
<i>Arctotheca calendula</i>	1	2	2
		Total Cover x Threat Invasion	14

BushRAT Site 12: *Eucalyptus diversifolia* +/- *E. fasciculosa* Mallee (patchy)

Management Unit: 12 Patchy mallee areas in Sn 1380 **Date of assessment:** 8/12/2015

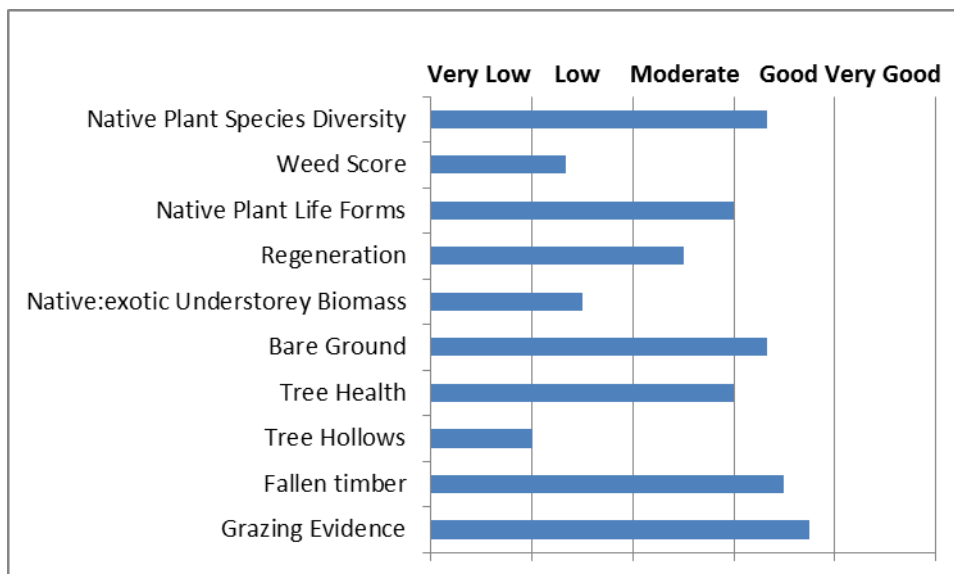
GPS Location of Photograph: 274309 6054897 **Direction:** SE

Benchmark Vegetation Community Type: SMLR Co 2 - Forests and Woodlands with an Open Sclerophyll Shrub Understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 12: Newland Head CP	
DESCRIPTION: Eucalyptus diversifolia +/- E. fasciculosa Mallee (patchy)	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	10
Weed Score (15)	4
Native Plant Life Forms (10)	6
Regeneration (8)	4
Native:exotic Understorey Biomass (10)	3
Bare Ground (3)	2
Tree Health (5)	3
Tree Hollows (5)	1
Fallen timber (5)	3.5
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	39.5
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	39.5

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta calycina</i>	2	4	8
<i>Asparagus asparagoides</i>	2	5	10
<i>Vulpia sp.</i>	3	2	6
<i>Ehrharta longiflora</i>	2	2	4
<i>Disa bracteata</i>	1	3	3
		Total Cover x Threat Invasion	31

BushRAT Site 13: *Beyeria lechenaultii*, *Olearia axillaris* +/- *Acrotriche cordata* Low Shrubland with emergent *Eucalyptus diversifolia*, *Melaleuca lanceolata*, *Leucopogon parviflorus*

Management Unit: 14 Newland Head Waitpinga Cliff faces and cliff-tops **Date of assessment:** 18/1/2016

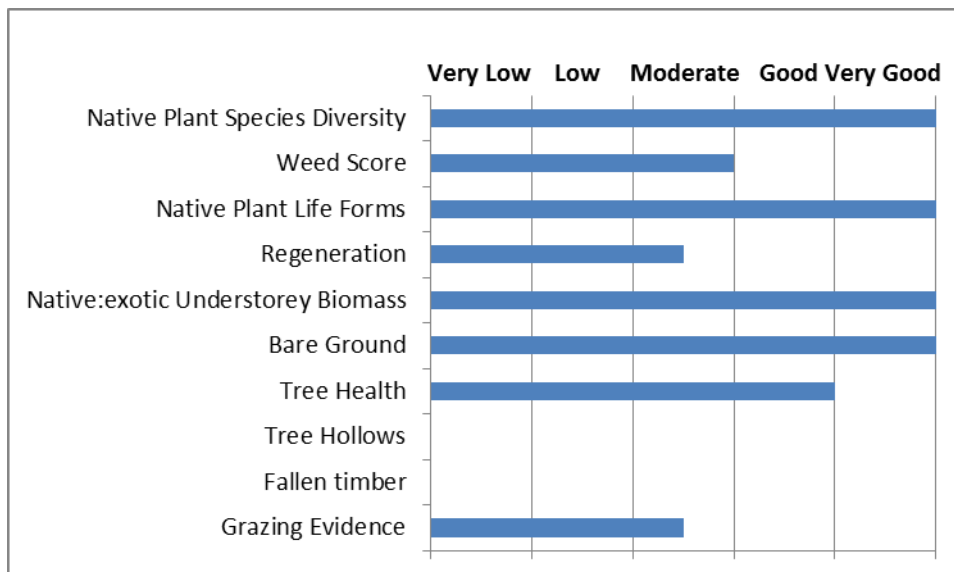
GPS Location of Photograph: 275204 6053195 **Direction:** S

Benchmark Vegetation Community Type: SMLR Co 7.4 - Coastal Cliff Low Shrublands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 13: Newland Head CP	
DESCRIPTION: Beyeria lechenaultii, Olearia axillaris +/- Acrotriche cordata Low Shrubland with emergent Eucalyptus diversifolia, Melaleuca lanceolata, Leucopogon parviflorus	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	15
Weed Score (15)	9
Native Plant Life Forms (10)	10
Regeneration (8)	4
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	3
Tree Health (5)	4
Tree Hollows (5)	
Fallen timber (5)	
Grazing Evidence (4)	2
TOTAL (ADD UP ALL POINTS)	57
If community is naturally treeless x TOTAL by 1.23	70.11
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	70.11
CONSERVATION SIGNIFICANCE SCORE:	score
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E ecosystem/ecological	0
2 pts for each State-R, 4 pts for each State-V, 6 pts for each State-E or Nationally-V, 8 pts for each Nationally-E plant species present ² .	4
1 pt for each State-R, 2 pts for each State-V, 3 pts for each State-E or Nationally-V, 4 pts for each Nationally-E fauna species for which suitable habitat is present. Double points for a sighting. ³	
% native vegetation remaining in IBRA Assoc. 0-2% = 5 pts; >2-5% = 4 pts; >5-10% = 3 pts; >10-20% = 2 pts; >20-50% = 1 pt; >50% = 0 pts	2
1 pt if Site contains a riparian zone, 2 pts if contains swamp/wetland (+/- riparian zone)	0
CONSERVATION SIGNIFICANCE SCORE	6

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Ehrharta longiflora</i>	1	2	2
<i>Brassica tournefortii</i>	1	2	2
<i>Vulpia sp.</i>	1	2	2
<i>Lagurus ovatus</i>	1	2	2
<i>Trifolium campestre</i>	1	2	2
Total Cover x Threat Invasion			10

BushRAT Site 14: *Eucalyptus diversifolia*, *Leucopogon parviflorus* +/- *Melaleuca lanceolata* Shrubland

Management Unit: 14 Newland Head and Waitpinga Cliff faces and cliff-tops **Date of assessment:** 18/1/2016

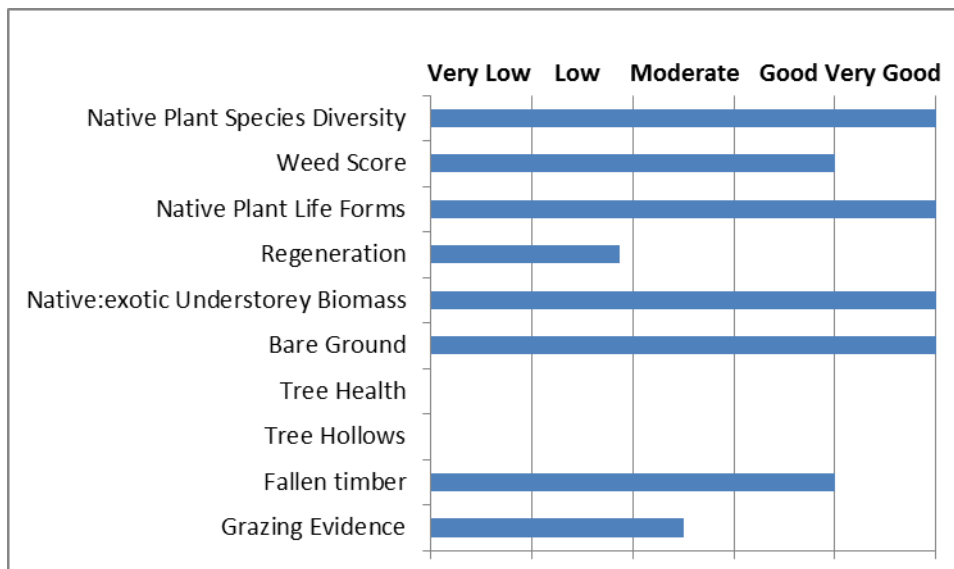
GPS Location of Photograph: 275909 6053211 **Direction:** S

Benchmark Vegetation Community Type: SMLR Co 7.4 - Coastal Cliff Low Shrublands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 14: Newland Head CP	
DESCRIPTION: Eucalyptus diversifolia, Leucopogon parviflorus +/- Melaleuca lanceolata Shrubland	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	15
Weed Score (15)	12
Native Plant Life Forms (10)	10
Regeneration (8)	3
Native:exotic Understorey Biomass (10)	10
Bare Ground (3)	3
Tree Health (5)	
Tree Hollows (5)	
Fallen timber (5)	4
Grazing Evidence (4)	2
TOTAL (ADD UP ALL POINTS)	59
If community is naturally treeless x TOTAL by 1.23	72.57
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	72.57

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Anagallis arvensis</i>	1	1	1
<i>Polypogon monspeliensis</i>	1	2	2
<i>Petrorhagia dubia</i>	1	1	1
<i>Thistle sp.</i>	1	2	2
	1		0
		Total Cover x Threat Invasion	6

BushRAT Site 15: *Eucalyptus diversifolia*, *Melaleuca lanceolata* Very Low Open Forest/Mallee

Management Unit: 10 Dune shrubland and coastal mallee patches in Sn 1380 **Date of assessment:** 18/1/2016

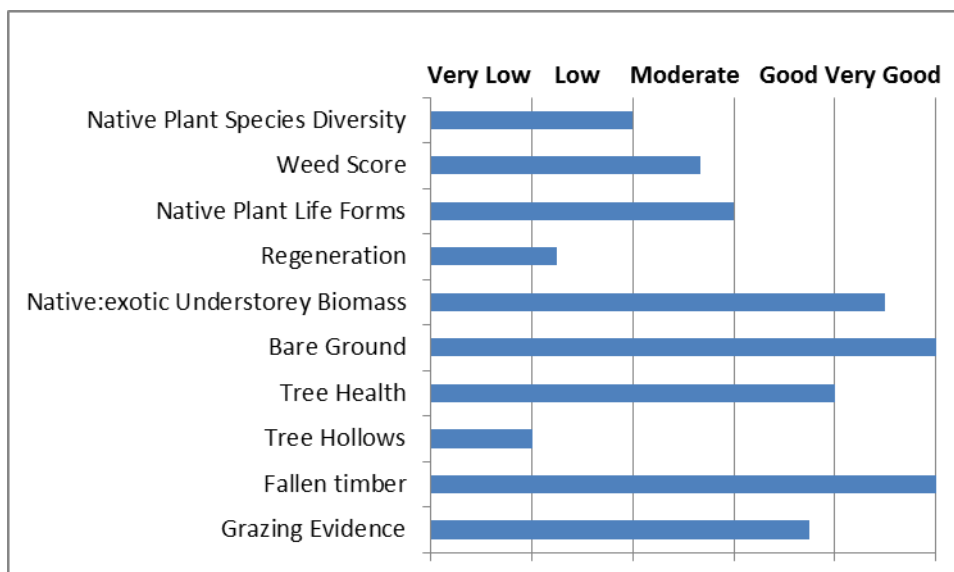
GPS Location of Photograph: 275415 6053471 **Direction:** S

Benchmark Vegetation Community Type: SMLR Co 1.2 - Coastal Very Low Woodlands with Heath Understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 15: Newland Head CP	
DESCRIPTION: Eucalyptus diversifolia, Melaleuca lanceolata Very Low Open Forest/Mallee	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	6
Weed Score (15)	8
Native Plant Life Forms (10)	6
Regeneration (8)	2
Native:exotic Understorey Biomass (10)	9
Bare Ground (3)	3
Tree Health (5)	4
Tree Hollows (5)	1
Fallen timber (5)	5
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	47
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	47

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Asparagus asparagoides</i>	2	5	10
<i>Polypogon monspeliensis</i>	1	2	2
<i>Vulpia sp.</i>	1	2	2
<i>Vicia sativa</i>	1	2	2
	1		0
		Total Cover x Threat Invasion	16

BushRAT Site 16: *Olearia axillaris*, *Acacia uncifolia* Shrubland over *Rhagodia candolleana*, *Adriana quadripartita*

Management Unit: 10 Dune shrubland and coastal mallee patches in Sn 1380 **Date of assessment:** 18/1/2016

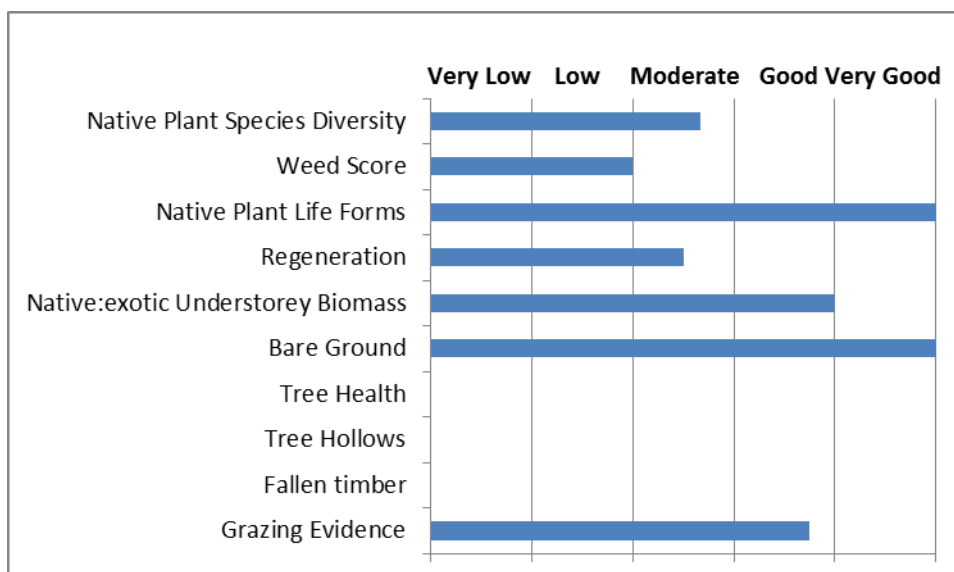
GPS Location of Photograph: 274804 6054501 **Direction:** S

Benchmark Vegetation Community Type: SMLR Co 7.2 - Coastal Shrublands and Tall Shrublands

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 16: Newland Head CP	
DESCRIPTION: Olearia axillaris, Acacia uncifolia Shrubland over Rhagodia candolleana, Adriana quadripartita	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	8
Weed Score (15)	6
Native Plant Life Forms (10)	10
Regeneration (8)	4
Native:exotic Understorey Biomass (10)	8
Bare Ground (3)	3
Tree Health (5)	
Tree Hollows (5)	
Fallen timber (5)	
Grazing Evidence (4)	3
TOTAL (ADD UP ALL POINTS)	42
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	51.66

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Asparagus asparagoides</i>	1	5	5
<i>Lagurus ovatus</i>	2	2	4
<i>Vulpia sp.</i>	3	2	6
<i>Galenia pubescens</i>	1	2	2
<i>Ehrharta longiflora</i>	2	2	4
		Total Cover x Threat Invasion	21

BushRAT Site 17: *Ehrharta calycina* Grassland with emergent *Eucalyptus diversifolia*, *Xanthorrhoea semiplana*

Management Unit: 13 “Rehabilitation” area of Section 1380 **Date of assessment:** 18/1/2016

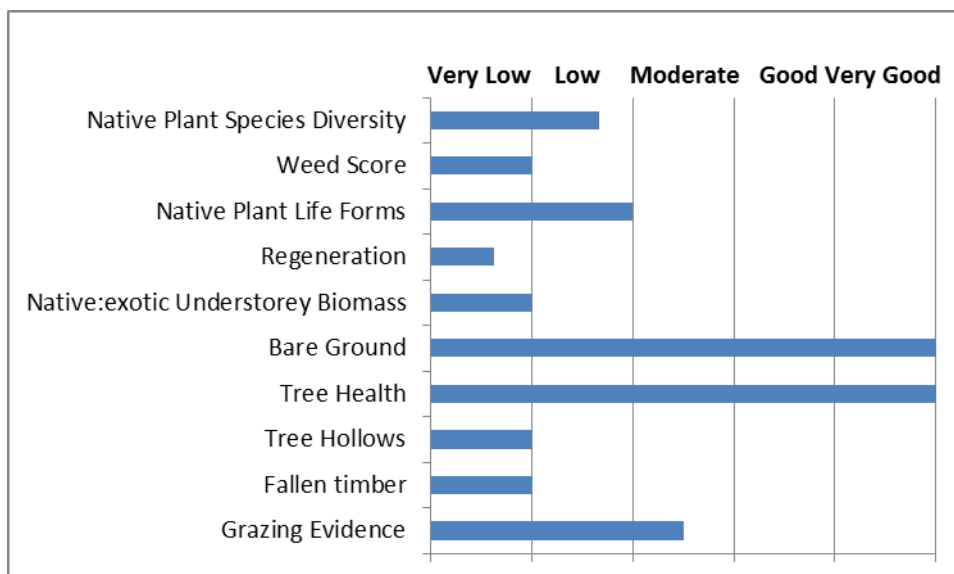
GPS Location of Photograph: 273976 6055237 **Direction:** S

Benchmark Vegetation Community Type: SMLR Co 2 - Forests and Woodlands with an Open Sclerophyll Shrub Understorey

Site photograph:



Scores for Individual BushRAT Components:



BushRAT Scoresheet:

SITE 17: Newland Head CP	
DESCRIPTION: Ehrharta calycina Grassland with emergent Eucalyptus diversifolia, Xanthorrhoea semiplana	
VEGETATION CONDITION SCORE (max. in	score
Native Plant Species Diversity (15)	5
Weed Score (15)	3
Native Plant Life Forms (10)	4
Regeneration (8)	1
Native:exotic Understorey Biomass (10)	2
Bare Ground (3)	3
Tree Health (5)	5
Tree Hollows (5)	1
Fallen timber (5)	1
Grazing Evidence (4)	2
TOTAL (ADD UP ALL POINTS)	27
If community is naturally treeless x TOTAL by 1.23	
If community is not benchmarked for regen x 1.11	
ADJUSTED TOTAL SCORE	27

Weed species (Top 5 Cover x Invasiveness, annuals in bold)	Cover (max. 6)	Invasive Threat Category (max. 5)	C x I
<i>Asparagus asparagoides</i>	2	5	10
<i>Lagurus ovatus</i>	2	2	4
<i>Onopordon acaulon</i>	1	2	2
<i>Ehrharta calycina</i>	4	4	16
<i>Ehrharta longiflora</i>	2	2	4
		Total Cover x Threat Invasion	36

Appendix 4: Revegetation plant species list

Newland Head Revegetation Plant List

Scientific name	Common name
<i>Acacia longifolia</i> var. <i>sophorae</i>	Coastal Wattle
<i>Acacia paradoxa</i>	Kangaroo Thorn
<i>Acacia pycnantha</i>	Golden Wattle
<i>Austrostipa</i> spp.	Spear Grass
<i>Billardiera cymosa</i>	Sweet Apple-berry
<i>Chrysocephalum apiculatum</i>	Common Everlasting
<i>Clematis microphylla</i>	Old Man's Beard
<i>Dianella brevicaulis</i>	Short-stem Flax-lily
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily
<i>Disphyma crassifolium</i>	Round-leaf Pigface
<i>Dodonaea viscosa</i>	Sticky Hop-bush
<i>Enchylaena tomentosa</i>	Ruby Saltbush
<i>Eucalyptus baxteri</i>	Brown Stringybark
<i>Eucalyptus cosmophylla</i>	Cup Gum
<i>Eucalyptus diversifolia</i>	Coastal White Mallee
<i>Eucalyptus fasciculosa</i>	Pink Gum
<i>Ficinia nodosa</i>	Knobby Club-rush
<i>Helichrysum leucopsidium</i>	Satin Everlasting
<i>Kennedia prostrata</i>	Running Postman
<i>Kunzea pomifera</i>	Muntries
<i>Lepidosperma viscidum</i>	Sticky Sword-sedge
<i>Leucopogon parviflorus</i>	Coast Beard-heath
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum
<i>Myoporum insulare</i>	Common Boobialla
<i>Olearia axillaris</i>	Coast Daisy-bush
<i>Pimelea serpyllifolia</i>	Thyme Riceflower
<i>Rhagodia candolleana</i>	Sea-berry Saltbush
<i>Rytidosperma</i> spp.	Wallaby Grass
<i>Senecio odoratus</i>	Scented Groundsel
<i>Scaevola crassifolia</i>	Cushion Fanflower
<i>Tetragonia implexicoma</i>	Bower Spinach
<i>Themeda triandra</i>	Kangaroo Grass

Appendix 5: Photopoint monitoring

Photopoint Monitoring (adapted from DEWNR's Native Vegetation & Biodiversity Unit – BushRAT methodology)

1. PHOTOPOINT RECORD SHEET - instructions

- Your photopoint locations may have already been established for you – however, if they are not permanently marked with a stake you will need to relocate them using a GPS unit and a combination of the photo that was taken and the recorded photo direction. You can then permanently mark them if you wish.
- If not yet established, select at least one site per Vegetation Association, preferably at locations where you will expect to observe significant changes, either in the short term (e.g. through woody weed removal) or longer term (e.g. through revegetation).
- The “camera point” is where you take the photo from, the “target point” is where you aim the camera. Either or both can be marked 10m apart with a survey peg, or could be a designated tree, fence post or other permanent feature. You could also mark the site (approximately) on one of the maps in your Management Plan
- Record details in the table below.
- Take photos a minimum of once each year, preferably at the same time(s) each year.
- Photos should be accompanied by notes that will provide further information, such as the names of plants in the photographs (as these may not be able to be determined from the photos alone) and possible explanations for why a photo differs from the last one (e.g. drought year). Enter these additional details/observations into the table. Other observations that could be recorded to help document and/or explain changes occurring at the site may include things like:
 - Improved condition of the native vegetation compared to that shown in the original photos.
 - Natural regeneration of native plant species eg. native grasses and wattle seedlings.
 - The appearance (natural regeneration) of plant species not previously recorded.
 - Accumulation of leaf litter and fallen timber which show signs of increased insect activity and decomposition.
 - Re-establishment of a moss or lichen crust.

MANAGEMENT UNIT: _____

Year: _____

Vegetation Association/Site	Photopoint Location	Photo taken by:	Direction camera point to target point	Distance camera point to target point	Date	Notes/Observations

2. PHOTOGRAPHS (or submit hard copies)

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Appendix 6: Works record sheets

WORKS RECORD (adapted from DEWNR's Native Vegetation & Biodiversity Unit – BushRAT methodolgy)

All Threats/Management Issues identified as requiring action (as per the Biodiversity Action Table) are listed below. Only some of these will have had actions proposed for this past year. Please fill in the table for these actions and write N/A next to those that did not require action in this past 12-month period.

Management Unit _____ Year _____ Date that you are filling in this form _____

WEEDS

Common Name	Actions undertaken this calendar year These may or may not correspond with the actions you proposed at the start of the year. If you did not propose any actions for this Management Issue this year, write N/A.	Status of infestation(s) State whether the infestations have increased significantly, increased slightly, decreased significantly, decreased slightly, or remained the same since this time last year. State this for all weeds, including those that you did not work on this past year.	Changes to the vegetation, fauna or other features Have you noticed any changes to the vegetation, fauna or other features of the site in the vicinity of your works? This may include an increase in regeneration of plants, new bird species seen in the area, increase in leaf litter, etc., Do you think these changes are a result of your works or other environmental factors?
Bridal Creeper infestation	Spot-sprayed using glyphosate 360g/L at 1:100. It took us 4 hours (2 people x 2 hrs).	All Bridal Creeper populations in Management Unit 2 appear to have remained at the same level. The sprayed population will hopefully have decreased in extent/vigour.	There was good regeneration of Golden Wattles this year, despite the Bridal Creeper. This was possibly a response to last year's hot Summer followed by good rains leading to good seed germination.

PEST ANIMALS

Pest threat or issue	Actions undertaken this calendar year These may or may not correspond with the actions you proposed at the start of the year. If you did not propose any actions for this Management Issue this year, write N/A.	Status of pest issue State whether the pest species or erosion area has increased significantly, increased slightly, decreased significantly, decreased slightly, or remained the same since this time last year. State this for all pests/erosion issues, including those that you did not work on this past year.	Changes to the vegetation, fauna or other features Have you noticed any changes to the vegetation, fauna or other features of the site in the vicinity of your works? This may include an increase in regeneration of plants, new bird species seen in the area, increase in leaf litter, etc., Do you think these changes are a result of your works or other environmental factors?
Foxes	Fumigated all dens using It took us 2 full adys with 2 people.		

VEGETATION REGENERATION/ REVEGETATION

Type of regeneration/revegetation issue	Actions undertaken this calendar year These may or may not correspond with the actions you proposed at the start of the year. If you did not propose any actions for this Management Issue this year, write N/A.	Status of regeneration/revegetation issue Describe the current extent/status/of the issue. Has it improved since last year?	Changes to the vegetation, fauna or other features Have you noticed any changes to the vegetation, fauna or other features of the site in the areas where this threat/issue occurs? This may include an increase in regeneration of plants, increase in tree dieback, new bird species seen in the area, increase in leaf litter, etc., and does not have to be a result of your works.
Poor vegetation structure (lack of groundcover plants)	We fenced and removed grazing stock as required in our clearance Decision Notification. The constructed fence is 2.3km long and is a post and dropper, 5 wire (2 barb) fence).	Vegetation structure has improved, but we are yet to clarify how much of this new growth is native. It would seem that the fencing has already led to positive changes since last year.	As already mentioned, there have been changes to the vegetation structure. It also seems that there are different types of plants emerging. We have seen new species of birds in the site (Red-browed Finch, Red-rumped Parrot) that are eating the grass seeds of the new plants.