

Conservation Action Planning

June 2017 Summary



WildEyre

A Collaborative, Landscape Planning Approach to
Biodiversity Conservation on Western Eyre Peninsula,
South Australia

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for the WildEyre project team



Acknowledgements

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1. Background

1.1. Introduction

This document summarises the progress of the **WildEyre Conservation Action Planning (CAP)** process to the 30th June 2017. The process commenced in late 2007 and the planning team has met regularly since then to develop and refine a conservation plan for the WildEyre region on western Eyre Peninsula.

Achievements of the WildEyre project to date include:

- development of a comprehensive Conservation Action Plan with spatial prioritisation for all major on-ground works programs based on local expert knowledge as well as GIS analysis
- development of promotional material including: project logo, promotional video, investment prospectus, website and media releases on traditional and social media
- recent launch of a WildEyre short film (21 June 2017), as part of a social media campaign. Since release the content has been viewed over 2,200 times on Facebook, 89 times through YouTube, an estimated 180 views via Twitter.
- development of detailed carbon modelling for the region (completed by Trevor Hobbs from DEWNR) and production of a fact sheet for local landholders
- memorandum of understanding between key partner organisations and successful joint delivery of programs like the Biodiversity Fund
- major on-ground works programs commenced including coastal weed control (all core Boxthorn infestations along several hundred kilometres of coastline), stewardship program to conserve Sheoak Grassy Woodlands and large-scale revegetation of Sheoak grassy woodland in priority areas in Lake Newland Conservation Park, Venus Bay Conservation Park, Lake Hamilton area and AWC's Dakalanta property
- extensive involvement of Traditional Owner groups in the program, particularly the Ceduna Aboriginal Corporation through on-ground activities such as seed collection and weed control
- successful funding applications totalling in excess of \$7M from the Caring for Our Country Program, Biodiversity Fund and Native Vegetation Council Significant Environmental Benefits Fund
- implementation of a landscape monitoring program (woodland birds, native vegetation condition; NCSA 2015, NCSA 2017, respectively).
- implementation of comprehensive performance monitoring programs associated with major on-ground works programs (African Boxthorn control, Red Gum grazing exclusion trials, Sustainable Sheoak project, rotational grazing trial at Russel Butchers (in progress))
- application of the national Society of Ecological Restoration Australia (SERA) restoration standards to relatively old (10-15 years post planting) sheoak grassy woodlands sites and development of a comprehensive performance monitoring approach (Koch 2017).
- development of a "lessons learnt" document based on an evaluation of the Biodiversity Fund program (in progress)
- development of an EPBC Threatened Ecological Community nomination process for Sheoak Grassy Woodlands (and other open woodlands on shallow calcareous soils, in progress).

1.1.1. Conservation Action Planning

The planning process for the WildEyre Project is based on the Open Standards for the Practice of Conservation (aka Conservation Action Planning). This framework is widely used in the development of international conservation projects and has also become widely adopted in Australia, particularly for planning large scale conservation projects with multiple stakeholders. One of the underpinning goals of CAP planning is to move conservation projects from the site scale (10's or 100's of hectares) to the conservation and preservation of functional landscapes (100,000's hectares) which are able to sustain biodiversity at an eco-regional scale (Low 2003).

The CAP process typically involves a series of conservation planning workshops with 5-10 participants from multiple organisations. The process is facilitated by a trained CAP coach and uses a standard step-by-step methodology (refer Low 2003) and purpose-built planning and project management software called Miradi, to guide participants through the development of a 1st iteration landscape conservation plan.

Whilst built on solid scientific principles, the approach recognises that there are often large gaps in ecological knowledge and data, and hence a strong on-going adaptive management ethic is implied throughout the process. It also recognises that a large amount of knowledge exists with local landholders and conservation practitioners, and therefore incorporates local practitioner input into the planning process.

The major steps in the CAP process are:

- an analysis of the regional context in which conservation is to occur;
- the identification of conservation assets and nested assets (i.e. ecosystems, communities and species);
- an analysis of the viability (i.e. health) of the conservation assets and the key threats;
- the development of measurable objectives to achieve the long-term conservation of the assets;
- the development of conservation strategies, action steps and key programs to achieve the conservation objectives;
- the development of a practical monitoring and evaluation program and adaptive management framework.



Figure 1. Adaptive management cycle, Open Standards for the Practice of Conservation v3.0.

1.2 Regional Planning Context

The WildEyre planning process is conducted at a sub-NRM regional scale. The conservation objectives and strategies developed complement existing regional NRM plans and strategies and contribute to national and state funding priorities (refer Table 1 below)

1.2.1 Eyre Peninsula Natural Resources Management (NRM) Board Region

The Eyre Peninsula NRM region extends from Whyalla in the north-east, Port Lincoln in the south and to the edge of the Nullarbor Plain in the north-west. The region contains approximately one third of South Australia's coastline including 254 offshore islands. In total the NRM region covers in excess of 8 million hectares of land and sea and supports a population of approximately 55,000 people (www.epnrm.sa.gov.au).

The WildEyre planning area makes up approximately 15% of the NRM region (refer to Map 1).

1.2.2 Biodiversity Conservation Organisations

The principle organisations involved in biodiversity conservation in the region are the Eyre Peninsula Natural Resources Management Board and the State Government Department for Environment, Water and Natural Resources (DEWNR). These organisations underwent a merger in 2010/11 and now function primarily as one organisation.

Other organisations involved in biodiversity conservation in the region include local government (i.e. Streaky Bay, Elliston), non-government organisations (Australian Wildlife Conservancy, Nature Conservation Society of South Australia, The Wilderness Society, Australian Conservation Volunteers, Greening Australia), private landholders and community groups (e.g. Friends of Scale Bay).

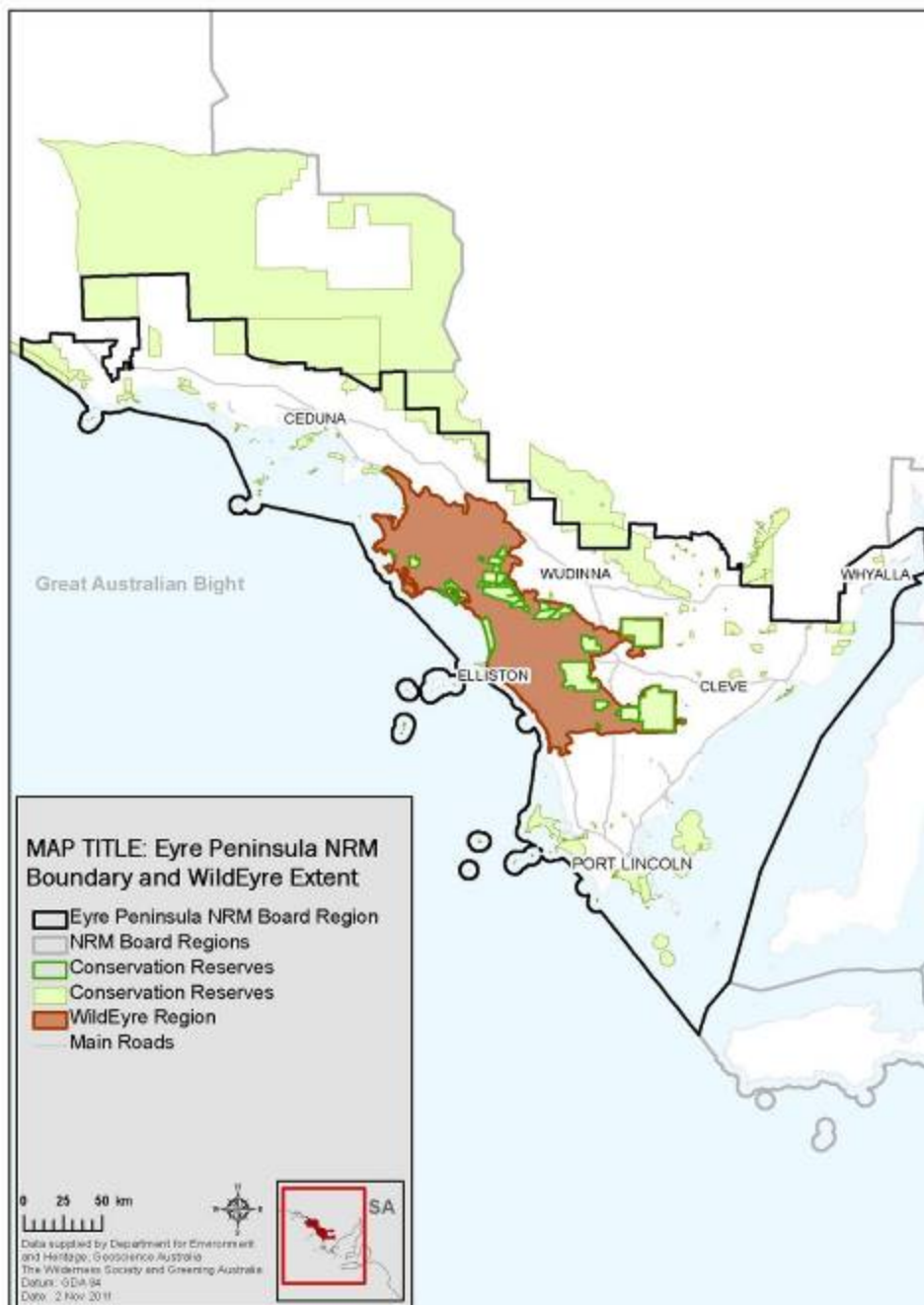
Table 1: Existing Biodiversity Programs, Strategies and Legislation

National	State (SA)	Regional (EP NRM)	National and State Legislation
<ul style="list-style-type: none"> • Caring for Our Country • Biodiversity Fund • Clean Energy Futures Program • National Water Initiative • National Strategy for the Conservation of Australia's Biological Diversity • Australian Government Climate Change Policies 	<ul style="list-style-type: none"> • State Strategic Plan • Tackling Climate Change • State Natural Resources Management Plan • No Species Loss • NatureLinks 	<ul style="list-style-type: none"> • Eyre Peninsula NRM Plan • Eyre Peninsula Biodiversity Plan • DENR Biodiversity Strategy • Threatened Species Recovery Plans • East Meets West NatureLinks 	<ul style="list-style-type: none"> • Environment Protection and Biodiversity Conservation Act 1999 (National) • National Parks and Wildlife Act 1972 (SA) • Native Vegetation Act 1991 (SA) • Natural Resources Management Act 2004 (SA) • Development Act 1993 (SA)

1.3 WildEyre Project Area

The WildEyre planning area covers over 1.2 million hectares of western Eyre Peninsula including the coastal townships of Sheringa and Elliston in the south, Streaky Bay in the north and extending inland to the large Wilderness Protection Areas of Hincks and Hambidge (see Map 1). The area contains some of the largest intact and contiguous stretches of bushland in South Australia's agricultural districts, supporting numerous national and state threatened plant and animal species. The region is recognised as of state and national significance for biodiversity conservation being a focus of the State Government's *NatureLinks* Program and a priority area for The Wilderness Society's *WildCountry* vision.

Map 1: Eyre Peninsula NRM Boundary and location of WildEyre project



1.3.1 Regional Landforms

The planning area largely follows the Talia IBRA subregion (Interim Biogeographic Regionalisation of Australia) which is characterised by extensive undulating dunefields and calcrete near the surface. Further inland and to the north the land surface is characterised by parallel sand dune systems associated with the Eyre Mallee IBRA Subregion. Other landforms of note include the geologically recent coastal sand dunes at Lake Newland, the sheltered low-energy coasts of Venus Bay, Sceale Bay and Streaky Bay and the high-energy exposed cliffs along much of the remaining coast. Granite outcrops are scattered through the central and northern part of the region and major features include Mount Wedge, Mount Damper and Murphy's Haystack.

1.3.2 Climate and Rainfall

The area is subject to a typical Mediterranean climate with mild wet winters and hot dry summers. Annual average rainfall decreases from south to north with Elliston recorded at 427mm and Streaky Bay with 380 mm. Rainfall also decreases toward the drier interior of the peninsula with Wudinna (just east of the project area) recording an average annual rainfall of approximately 268 mm. Temperatures, winds and rainfall are heavily influenced by the open coast along the western part of the region.

1.3.4 European Land Use History

European settlement began at Port Lincoln in 1839 and pastoral occupation extended slowly along the coasts until the 1890s (www.atlas.sa.gov.au). Agricultural expansion occurred from the 1930s and accelerated in the post Second World War period due to an increased use of superphosphate and medic pastures which improved soil fertility and grain yields. The majority of native vegetation clearance occurred in the post Second World War period which is relatively recent in the context of the southern agricultural region of South Australia.

1.3.5 Native Vegetation

The western Eyre Peninsula contains a high proportion of native vegetation cover compared with many other agricultural districts of South Australia, principally due to the unsuitability of the limestone country for agriculture. Native vegetation covers over 730,000 hectares or 60% of the planning area with the majority in the central parts of the region away from the coast. The dominant vegetation types are mallee associations on deep sand in central Eyre Peninsula (dominated by *Eucalyptus incrassata*, *E. yalataensis*, *E. dumosa*), on limestone in sub-coastal areas (*Eucalyptus diversifolia*) and in inland limestone areas (*E. dumosa*, *E. oleosa*, *E. gracilis*, *E. socialis*, *E. brachycalyx*).

Woodlands of Mallee Box (*Eucalyptus porosa*), Native Pine (*Callitris gracilis*) and Drooping Sheoak (*Allocasuarina verticillata*) were once a dominant vegetation type in the region. However Drooping Sheoak Woodlands in particular have declined significantly in extent since European settlement. The understorey of these woodlands is often dominated by grasses and sedges with a scattered shrub layer, although it does vary from predominantly grassy to predominantly sedges to densely shrubby. Most of the open ground with native grasses and sedges in the region probably once supported an overstorey of Sheoak, Native Pine or Mallee Box.

Coastal areas support tall shrublands comprised of *Olearia axillaris*, with *Leucopogon parviflorus*, *Rhagodia candolleana*, *Acacia anceps* (now *Acacia* sp. 'Winged'), *Acacia cupularis* and *Templetonia retusa* over smaller coastal shrubs, climbers and groundcovers. Rear dunes often support Drooping Sheoak (*Allocasuarina verticillata*) woodlands with tall shrubs including those listed above and other species such as *Acacia nematophylla*. A large example of this vegetation type can be found at Lake Newland Conservation Park between Elliston and Venus Bay.

The margins of coastal wetlands and inlets are dominated by samphires with *Sarcocornia* spp. in regularly inundated zones and *Tecticornia* spp. in less frequently inundated zones. Swamp Paperbarks (*Melaleuca halmaturorum*) also occur on wetland margins adjacent to *Gahnia filum* sedgeland. Other common salt-tolerant species include *Wilsonia humilis*, *Suaeda australis*, *Samolus repens*, *Maireana oppositifolia* and *Hemichroa pentandra*. Pockets of River Red Gum (*Eucalyptus camaldulensis* var. *camaldulensis*) woodland also occur amongst limestone where trees can access

groundwater or where surface water collects. Commonly associated shrubs include Scarlet Bottlebrush (*Callistemon rugulosus*) and Native Hibiscus (*Alyogyne heugelii*).

Vegetation communities of conservation significance include Drooping Sheoak (*Allocasuarina verticillata*) Grassy Low Woodland (not including coastal woodland on sand), Thatching Grass (*Gahnia filum*) Sedgeland and Cummins Mallee (*Eucalyptus penninsularis*) +/- White Mallee (*E. dumosa*) Mallee

Flora species of conservation significance

A high diversity of plant species is found in the project area including at least 118 species which are Endangered, Vulnerable or Rare at the state level under National Parks and Wildlife Act 1974, and at least 16 which are rated nationally threatened under the Environment Protection and Biodiversity Conservation Act 1996. Selected threatened flora records are displayed in Map 3 and Appendix 1 contains a complete list of state and nationally rated flora species.

Gillam and Urban (2009) analysed the conservation status of plant species on Eyre Peninsula by IBRA subregion and in addition to the regional conservation status, trends show that 14 species in the Talia subregion and 13 species in the Eyre Mallee subregion are considered as definitely declining, and 131 species and 143 species respectively are considered as probable declining in distribution and/or abundance.

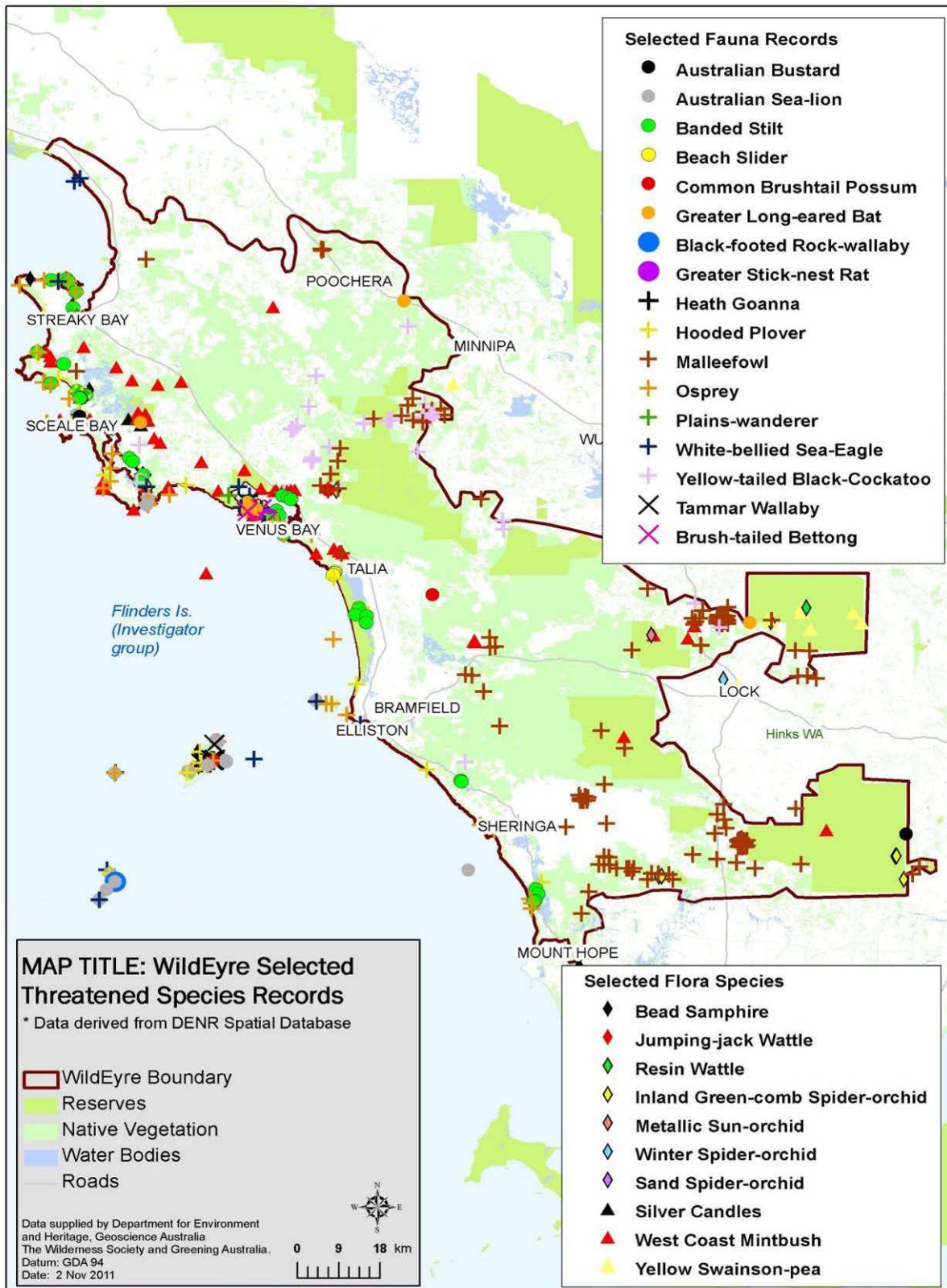
1.3.6 Fauna

According to the biodiversity plan for Eyre Peninsula (DEWNR 2002) over 475 vertebrate fauna species have been recorded on Eyre Peninsula. It is difficult to estimate the number of species which were historically found in the WildEyre region but it is known that many species have declined or disappeared due to the impacts of vegetation clearance/habitat loss and the introduction of feral predators (foxes and cats).

Notable remaining fauna species include Australian Sea-lions (*Neophoca cinerea*) along the coast, birds such as the Malleefowl (*Leipoa ocellata*), White-bellied Sea-Eagle (*Haliaeetus leucogaster*) and Yellow-tailed Black Cockatoo (*Calyptorhynchus funereus*) and mammals such as the Sandhill Dunnart (*Sminthopsis psammophila*) and Greater Stick-nest Rat (*Leporillus conditor*). The region is also notable for the reintroduction of Greater Bilby (*Macrotis lagotis*) and Brush-tailed Bettong (*Bettongia penicillata*) to offshore islands and within Venus Bay Conservation Park. Also of note is the population of Pearsons Black-footed Rock-wallaby (*Petrogale lateralis pearsoni*) on Pearson Island which is one of only 5 populations nationally occurring on offshore islands (DEWNR 2002).

The DEWNR spatial database records show over 60 vertebrate fauna species of state or national conservation significance currently occur within the region. This number does not include whale species which frequently visit the coast or some of the highly mobile pelagic birds such as albatross species. Selected threatened fauna records are displayed in Map 3 and Appendix 2 contains a complete list of state and nationally rated fauna species. Gillam and Urban (2009) also analysed the conservation status of vertebrate fauna species on Eyre Peninsula by IBRA. In addition to the regional conservation status, trends show that 20 species in the Talia subregion and 10 species in the Eyre Mallee subregion are considered in definite decline and 52 species and 54 species respectively are considered in probable decline.

Map 2: Selected Threatened Species Records (DEWNR 2007)



1.4 Social Context

1.4.1 Population

The project area is sparsely populated compared with many other areas in the southern agricultural districts of South Australia. The Local Government Areas of Streaky Bay and Elliston comprise most of the project area and in 2006 supported 2,024 and 1,132 person respectively (www.abs.gov.au). The main population centres are the coastal towns of Streaky Bay which recorded 1059 persons within the urban locality in 2006, Elliston (201 persons), and Venus Bay (139 persons). The workforce is predominantly agricultural with 42% of the workforce in the District Council of Elliston and 27.8% of the workforce in the District Council of Streaky Bay identifying their main occupation as sheep, beef cattle or grain farming.

Table 5: Selected Demographic Statistics from the 2006 Census

Location (LGA)	Population 2006	Labour Force	Farming Labour Force	% Involved Farming
Streaky Bay	2024	1018	273	27.8%
Elliston	1132	579	235	42%
TOTAL	3156	1597	508	

1.4.2 Aboriginal Communities

Traditional owners retain strong connections to country in the WildEyre landscape and evidence of Aboriginal occupation exists throughout the project area, including stone artefacts, campsites, middens, stone arrangements, burial sites, paintings and engravings. Furthermore, many Aboriginal people live within or regularly visit the area.

The WildEyre project area covers three existing Native Title claims: Wirangu No. 2; Nauo-Barngarla and Barngarla. The Ceduna Aboriginal Corporation has developed strong links with the WildEyre project in recent years, participating in seed collection, weed control and other on-ground activities.

1.4.3 Current Land Management and Ownership

There are between 500 and 600 landholders in the WildEyre region with most properties between 1,000 hectares and 5,000 hectares.

The project area also includes land under 6 local government jurisdictions, however the vast majority falls under the District Council of Streaky Bay in the north and the District Council of Elliston in the south. The area also contains 24 conservation reserves managed by DEWNR (including offshore islands) and 83 Heritage Agreements totalling approximately 103,000 hectares or 8.5% of the area.

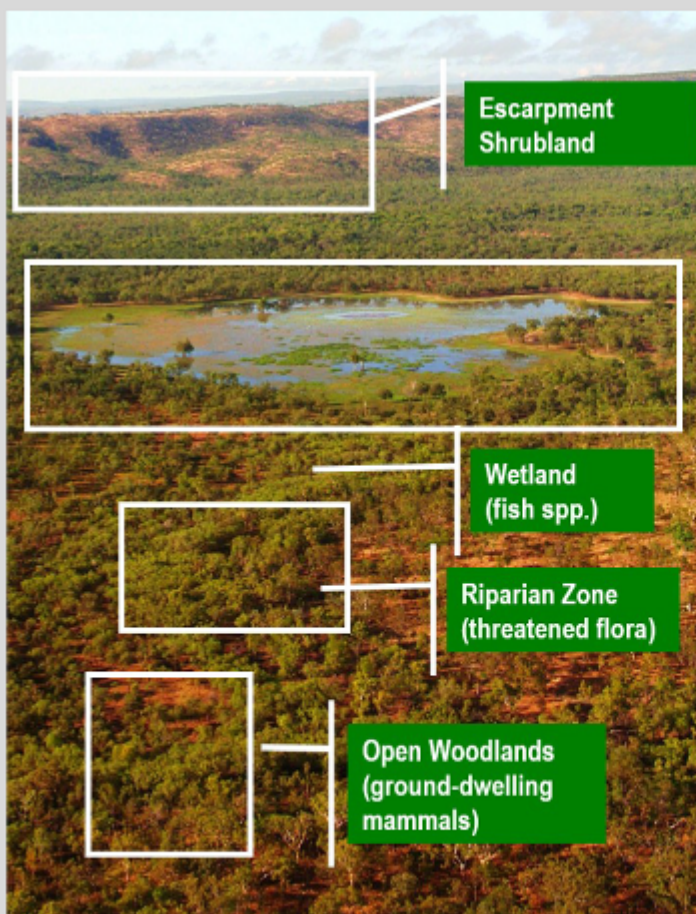
2. Conservation Assets

BOX 1: Asset Identification

The first step in the conservation action planning process involves the identification focal conservation assets (i.e. ecosystems, communities or species) that collectively represent the biodiversity of a region. The implicit assumption within this process is that by conserving representative examples of broad-scale communities and ecosystems, the majority of species will also be conserved. The list of focal conservation assets therefore need not be long and exhaustive; rather, it should be short and representative. In general, the CAP methodology recommends that no more than eight conservation assets are selected to be the focus of a landscape conservation program.

The asset selection process begins by identifying the coarse-scale ecosystems and communities for conservation. The principle idea is that different types of assets require different types of management, so in developing a plan we need to consider how different communities differ in their conservation requirements. The issue of whether to lump individual ecosystems and communities together or split into individual conservation assets is often a difficult one. In general, ecosystems and communities are lumped together if they:

- co-occur across the landscape
- share similar ecological processes
- share similar threats



The next step is to screen for species and communities occurring at smaller scales that are not well “nested” within the broader set of ecosystems or communities; that is, those species and communities whose conservation requirements are not met through the conservation of the coarse-scale assets (as suggested by Noss et al. 1999; Margules and Pressey 2000; MacNally et al. 2002). This approach is known as the coarse filter–fine filter approach (Groves 2003). Examples of species often not captured by coarse-scale assets include:

- threatened species with specialised habitat requirements
- species with highly disjunct (spatially separate) populations or restricted distributions
- wide-ranging species

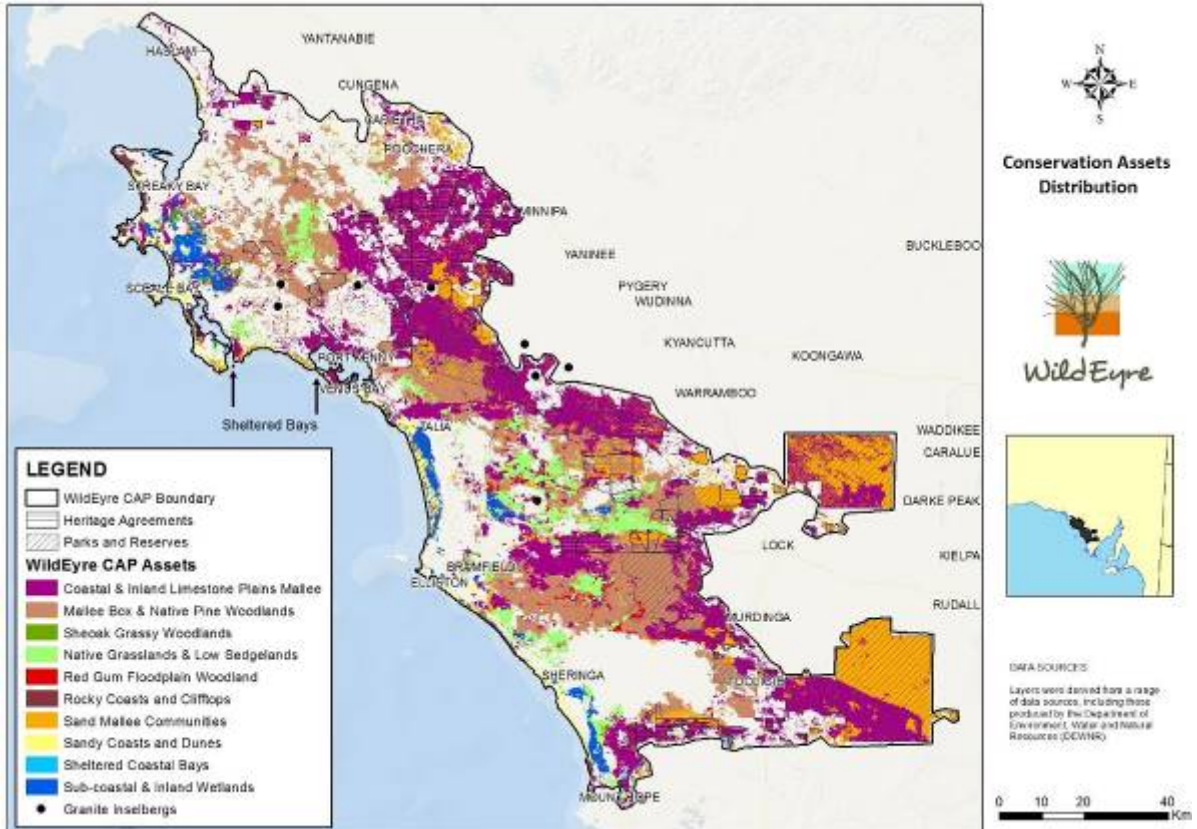
Pragmatic reasons may also influence decisions about whether to make a species an asset rather than a nested asset, for example a project team may decide to nest a threatened species that has specialized conservation requirements but is already the focus of a separate recovery program with a dedicated recovery team.

2.1. Conservation Assets

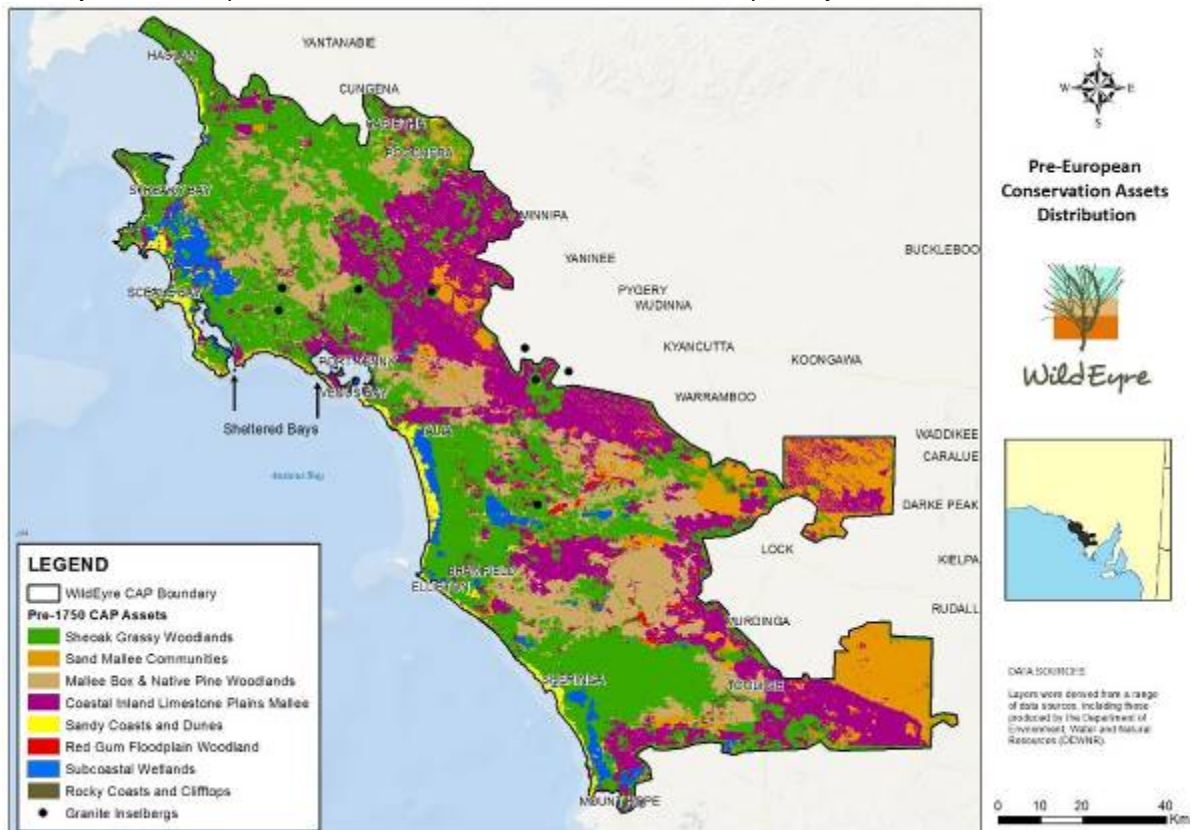
Ten focal conservation assets have been identified by the WildEyre planning team. Each conservation asset is associated with numerous nested assets (i.e. individual communities, species assemblages and threatened species) which help further define the asset and provide a focus for conservation efforts. The spatial distribution of the assets is presented in Map 4.

- 1. Sandy Coasts and Dunes**
- 2. Rocky Coasts and Cliffs**
- 3. Sheltered Coastal Bays**
- 4. Sub-coastal Wetlands**
- 5. Sub-coastal & Limestone Plains Mallee**
- 6. Sand Mallee (including dune top remnants)**
- 7. Red Gum Woodlands**
- 8. Mallee Box and Native Pine Woodlands**
- 9. Sheoak Grassy Woodlands (includes Native Grasslands and Low Sedgelands)**
- 10. Granite Outcrops**

Map 3: Conservation Assets of the WildEyre Project Area



Map 4: Pre-European Extent of Conservation Assets of the WildEyre Project Area



2.1.1. Sandy Coasts and Dunes

Sandy coasts and dunes refer to the high energy beach and dune systems on the western Eyre Peninsula. The most notable example occurs at Lake Newland Conservation Park where almost 6,000 hectares of tall dunes form a barrier between the coast and a lowland wetland system. Smaller coastal dunes occur between Elliston and Sheringa and in the Venus Bay to Streaky Bay region. These areas provide critical habitat for Hooded Plovers, Fairy Terns and a range of other coastal bird species. Near-shore waters support sand and sea-weed mosaics which provide important habitat for marine fish species.



Nested Assets		AUS	SA
Plant Communities	Coastal Dune Shrublands (<i>Olearia axillaris</i> , <i>Leucopogon parviflorus</i>)		
Threatened Birds	Hooded Plover (<i>Thinornis rubricollis</i>)		V
Threatened Birds	Fairy Tern (<i>Sterna nereis</i>)		V
Threatened Reptiles	Beach Slider (<i>Lerista arenicola</i>)		R
Threatened Reptiles	Long-legged Slider (<i>Lerista microtis</i>)		R
Threatened Reptiles	Heath Monitor / Goanna (<i>Varanus rosenbergii</i>)		R
Other Species of Note	Pacific Gull (<i>Larus pacificus</i>) note: largest nesting colony		
Other Species of Note	Little Penguin (<i>Eudyptula minor</i>)		
SPECIES ASSEMBLAGE	Shore birds (Plovers, Sandpipers, Sanderlings, Godwit, Terns, Stints, Knots, Oyster-catchers)		
SPECIES ASSEMBLAGE	Fish & shellfish (KG Whiting, Flathead, School Shark, Razorfish, Cockles)		

2.1.2. Rocky Coasts and Cliffs

Rocky coasts and cliffs occur in high energy environments and are characterised by tall cliffs and rocky shore platforms. These areas support diverse low shrublands on clifftops and provide important habitat for threatened species such as the White-bellied Sea-Eagle (*Haliaeetus leucogaster*), Eastern Osprey (*Pandion haliaetus*) and West Coast Mintbush (*Prostanthera calycina*). The rocky shoreline also provides critical habitat for the nationally vulnerable Australian Sea-lion (*Neophoca cinerea*).



Nested Assets		AUS	SA
Plant Communities	Coastal Cliff Shrubland (<i>Leucophyta brownii</i> , <i>Lasopetalum discolour</i>)		
Threatened Mammals	Australian Sea-Lion (<i>Neophoca cinerea</i>)	VU	
Threatened Birds	White Bellied Sea-Eagle (<i>Haliaeetus leucogaster</i>)		V
Threatened Birds	Osprey (<i>Pandion haliaetus</i>)		R
Threatened Birds	Rock Parrot (<i>Neophema petrophila</i>)		R
Threatened Plants	West Coast Mintbush (<i>Prostanthera calycina</i>) – EP Endemic	VU	
SPECIES ASSEMBLAGE	Seals, Sea Lions		

2.1.3. Sheltered Coastal Bays

Sheltered coastal bays are low-energy environments which provide vital habitats for shorebirds, waterbirds, fish and marine mammals. A mix of vegetation types occur around these bays including areas of samphire low shrubland and small stands of Grey Mangrove (*Avicennia marina*). Important coastal bays include Bairds Bay, Streaky Bay and Venus Bay.



Nested Assets		AUS	SA
Plant Communities	Coastal Mangroves (<i>Avicennia marina</i>) Low forests		
Plant Communities	Samphire (<i>Halosarcia sp.</i> , <i>Sclerostegia sp.</i> , <i>Sarcocornia sp.</i>) shrublands		
Plant Communities	Coastal dune (<i>Olearia axillaris</i> , <i>Leucopogon parviflorus</i>) shrubland		
Plant Communities	Coastal Cliff (<i>Leucophyta brownii</i> , <i>Lasiopetalum sp</i>) Low shrubland		
Threatened Mammals	Australian Sea-Lion (<i>Neophoca cinerea</i>)	VU	
Threatened Plants	Beaded Samphire (<i>Halosarcia flabelliformis</i>) check distribution?	VU	
Threatened Birds	Slender-billed Thornbill (<i>Acanthiza iredalei</i>)	VU	
Threatened Birds	Eastern Curlew (<i>Numenius madagascariensis</i>)		V
SPECIES ASSEMBLAGE	Shore birds (Plovers, Sandpipers, Sanderlings, Godwit, Terns, Stints, Knots, Oyster-catchers)		
SPECIES ASSEMBLAGE	Water birds (Ducks, Pelicans, Swans, Cormorant, Darters, Egrets, Heron)		
SPECIES ASSEMBLAGE	Fish & shellfish (KG Whiting, Flathead, School Shark, Razorfish, Cockles)		
SPECIES ASSEMBLAGE	Seals, Sea Lions		
IMPORTANT WETLANDS	Bairds Bay, Streaky Bay, Point Labatt		

2.1.4. Sub-coastal Wetlands

Sub-coastal wetlands occur adjacent to coastal dunes and cliffs and include nationally important areas such as Lake Newland and Lake Hamilton. These wetlands support Salt Paperbark low forests (*Melaleuca halmaturorum*, *M. brevifolia*), low samphire shrublands and state vulnerable Thatching Grass (*Gahnia filum*) sedgeland. Sub-coastal wetlands provide critical habitat for many migratory wading birds and Lake Newland is internationally recognised as a valuable migratory bird habitat.



Nested Assets		AUS	SA
Plant Communities	Saltwater Paperbark (<i>Melaleuca halmaturorum</i> , <i>M. brevifolia</i>) forest		
Plant Communities	Thatching Grass (<i>Gahnia filum</i>) Sedgelands		V
Plant Communities	Samphire Low Shrublands, Nitre bush (<i>Nitraria billardierei</i>) Shrublands		
Threatened Birds	Slender-billed Thornbill (<i>Acanthiza iredalei</i>) (possible occurrence)	VU	R
Threatened Birds	Eastern Curlew (<i>Numenius madagascariensis</i>)		V
Threatened Invertebrates	Yellowish sedge-skipper (<i>Hesperilla flavescens flavia</i>)	EN	
SPECIES ASSEMBLAGE	Shore birds (Plovers, Sandpipers, Sanderlings, Godwit, Terns, Stints, Knots, Oyster-catchers)		
SPECIES ASSEMBLAGE	Water birds (Ducks, Pelicans, Swans, Cormorant, Darters, Egrets, Heron)		
IMPORTANT WETLANDS	Lake Newland, Lake Hamilton		

2.1.5. Sub-coastal and Limestone Plains Mallee

Sub-coastal and Limestone Plains Mallee associations comprise the majority of the remnant native vegetation in the project area and support a high diversity of flora and fauna species. Flora species of note include the nationally vulnerable West Coast Mintbush (*Prostanthera calycina*). Notable fauna species include the nationally vulnerable Malleefowl (*Leipoa ocellata*), Greater Long-eared Bat (*Nyctophilus timoriensis*) and a number of small mammal species such as the Western Pygmy Possum (*Cercartetus concinnus*).



Nested Assets		AUS	SA
Plant Communities	Coastal Mallee (<i>Eucalyptus diversifolia</i>)		
Plant Communities	Limestone Plains Mallee (<i>E. gracilis</i> , <i>E. oleosa</i> , <i>E. dumosa</i> , <i>E. brachycalyx</i>)		
Threatened Mammals	Greater Long-eared Bat (<i>Nyctophilus timoriensis</i>)		V
Threatened Birds	Mallee Fowl (<i>Leipoa ocellata</i>)	VU	V
Threatened Birds	EP Yellow Tailed Black Cockatoo (<i>Calyptorhynchus funereus</i>)		E
Threatened Reptiles	Heath Goanna (<i>Varanus rosenbergi</i>)		R
Threatened Reptiles	Carpet Python (<i>Morelia spilota</i>)		V
Threatened Plants	West Coast Mintbush (<i>Prostanthera calycina</i>) EP Endemic	VU	V
Threatened Plants	Goldsack's Leek-orchid (<i>Prasophyllum goldsackii</i>)		E
Threatened Plants	Yellow Swainson-pea (<i>Swainsona pyrophila</i>)	EN	R
SPECIES ASSEMBLAGE	Small Mammals (Pygmy Possum, Dunnarts, Ningai, Hopping-mouse)		
SPECIES ASSEMBLAGE	Mammals (Western Grey Kangaroo, Bats, Echidnas)		
SPECIES ASSEMBLAGE	Reptiles (Goannas, skinks, Dragons, Geckos, Snakes, Pythons)		
SPECIES ASSEMBLAGE	Woodlands Birds, Ground-dwelling Birds (Emus, Quail)		

2.1.6. Sand Mallee (including dune top remnants)

Sand mallee occurs on light sandy soils in the eastern parts of the region. Dominant over-storey species include *Eucalyptus incrassata*, *E. leptophylla*, *E. dumosa* and *E. socialis*. Shrubland areas are dominated by Shrubby Cypress-pine (*Callitris verrucosa*) and Broombush (*Melaleuca uncinata*). Large areas of this habitat type occur in Hinks and Hambidge wilderness areas and provide important habitat for nationally threatened fauna such as the Mallee Fowl and the Sandhill Dunnart. Sand mallee areas outside of the formal reserve system are heavily fragmented and occur as narrow strips on inland dunes.



Nested Assets		AUS	SA
Plant Communities	Sand Mallee (<i>Eucalyptus incrassata</i> , <i>E. leptophylla</i> , <i>Callitris verrucosa</i>)		
Threatened Mammals	Sandhill Dunnart (<i>Smithnopsis psammophila</i>)	EN	E
Threatened Birds	Mallee Fowl (<i>Leipoa ocellata</i>)	VU	
Threatened Birds	EP Yellow Tailed Black Cockatoo (<i>Calyptorhynchus funereus</i>)		E
Threatened Reptiles	Dwarf four-toed Slider (<i>Lerista distinguenda</i>)		R
Threatened Plants	Sand Spider Orchid (<i>caladenia</i> sp. Southeast)	EN	
Threatened Plants	Yellow Swainson-pea (<i>Swainsona pyrophila</i>)	EN	R
SPECIES ASSEMBLAGE	Small Mammals (Pygmy Possum, Dunnarts, Ningai, Hopping-mouse)		
SPECIES ASSEMBLAGE	Mammals (Western Grey Kangaroo, Bats, Echidnas)		
SPECIES ASSEMBLAGE	Reptiles (Goannas, skinks, Dragons, Geckos, Snakes, Pythons)		
SPECIES ASSEMBLAGE	Woodland Birds, Ground-dwelling Birds (Emus, Quail)		

2.1.7. Red Gum Woodlands

Red Gum Woodlands are a relatively uncommon habitat type with a patchy distribution in the project area. The main occurrence is on limestone soils east of Elliston and toward Bascome Well Conservation Park. These woodlands are commonly associated with shallow depressions in the limestone where surface water may collect or groundwater is easily accessible. Red Gum Woodlands provide important habitat for woodland birds.



Nested Assets		AUS	SA
Plant Communities	Red Gum (<i>Eucalyptus camaldulensis</i>) Woodland		
Threatened Birds	Plains-wanderer (<i>Pediononus torquatus</i>) – (unlikely but possible)	VU	E
SPECIES ASSEMBLAGE	Mammals (Hairy-nosed Wombat, Western Grey Kangaroo, Brushtail Possum, Bats, Echidnas)		
SPECIES ASSEMBLAGE	Reptiles (Goannas, skinks, Dragons, Geckos, Snakes, Pythons)		
SPECIES ASSEMBLAGE	Birds of Prey (Hawks, Eagles, Kites, Falcons, Kestrels)		
SPECIES ASSEMBLAGE	Woodland Birds (Pigeons, Ringnecks, Budgerigars, Cuckoos, Owls, Frogmouths, Kingfishers, Bee-eaters, Tree-creepers, Wrens, Pardalotes, Thornbills, Honeyeaters, Wattlebird, Chats, Robins, Babblers, Whistlers, Flycatchers, Wagtails, Woodswallow, Magpie, Ravens, Swallows)		
SPECIES ASSEMBLAGE	Ground-dwelling Birds (Emus, Quail)		

2.1.8. Mallee Box and Native Pine Woodlands

Mallee Box Woodlands occur throughout the project area with Native Pine Woodlands more restricted in their distribution. This vegetation type generally occurs with an open understorey dominated by grasses, sedges and low shrubs. Livestock grazing is common within this vegetation type.



Nested Assets		AUS	SA
Plant Communities	Native Pine (<i>Callitris gracilis</i>) Woodland		
Plant Communities	Mallee Box (<i>Eucalyptus porosa</i>) Low woodlands / mallee		
Threatened Birds	Plains-wanderer (<i>Pediononus torquatus</i>)	VU	E
SPECIES ASSEMBLAGE	Mammals (Hairy-nosed Wombat, Western Grey Kangaroo, Bats, Brushtail Possum, Echidnas)		
SPECIES ASSEMBLAGE	Reptiles (Goannas, Skinks, Dragons, Geckos, Snakes)		
SPECIES ASSEMBLAGE	Birds of Prey (Hawks, Eagles, Kites, Falcons, Kestrels)		
SPECIES ASSEMBLAGE	Birds (Pigeons, Ringnecks, Budgerigars, Cuckoos, Owls, Frogmouths, Kingfishers, Bee-eaters, Tree-creepers, Wrens, Pardalotes, Thornbills, Honeyeaters, Wattlebird, Chats, Robins, Babblers, Whistlers, Flycatchers, Wagtails, Woodswallow, Magpie, Ravens, Swallows)		
SPECIES ASSEMBLAGE	Ground-dwelling Birds (Emus, Quail)		

2.1.9 Sheoak Grassy Woodlands

Sheoak Grassy Woodlands occur on shallow limestone soils with an understorey dominated by native grasses, sedges, herbs and low shrubs. This habitat type has been heavily cleared and fragmented in the project area with approximately 5% of its original distribution remaining. Most remnant areas are in private ownership and subject to livestock grazing. Sheoak Grassy Woodlands provide important habitat to a range of declining woodland bird species. This asset includes treeless native grasslands and low sedgelands that are dominated by Spear-grass (*Austropstipa spp.*), Wallaby Grass (*Austrodanthonia spp.*) and Black-grass (*Gahnia lanigera*). It is likely that the vast majority of these grasslands formerly had a sheoak overstorey that has been lost over time through sustained grazing pressure. Native grasslands provide habitat for the nationally vulnerable Plains-wanderer (*Pediononus torquatus*).



Nested Assets		AUS	SA
Plant Communities	Sheoak (<i>Allocasuarina verticillata</i>) Grassy woodlands		V
Threatened Birds	Plains-wanderer (<i>Pediononus torquatus</i>) – (unlikely but possible)	VU	E
Threatened Birds	Diamond Firetail (<i>Stagonopleura guttata</i>)		V
SPECIES ASSEMBLAGE	Mammals (Hairy-nosed Wombat, Western Grey Kangaroo, Bats, Brushtail Possum, Echidnas)		
SPECIES ASSEMBLAGE	Reptiles (Goannas, Skinks, Dragons, Geckos, Snakes)		
SPECIES ASSEMBLAGE	Birds of Prey (Hawks, Eagles, Kites, Falcons, Kestrels)		
SPECIES ASSEMBLAGE	Woodland Birds (Pigeons, Ringnecks, Budgerigars, Cuckoos, Owls, Frogmouths, Kingfishers, Bee-eaters, Tree-creepers, Wrens, Pardalotes, Thornbills, Honeyeaters, Wattlebird, Chats, Robins, Babblers, Whistlers, Flycatchers, Wagtails, Woodswallow, Magpie, Ravens, Swallows)		
SPECIES ASSEMBLAGE	Ground-dwelling Birds (Emus, Quail)		

2.1.10 Granite Outcrops

Granite outcrops and inselbergs in the project area are small and unique environments. There is a clear link between the presence of granite and the distribution of specific plant species and vegetation communities. This includes Nodding Grass lily (*Stypandra glauca*), Needle leaf honey myrtle (*Melaleuca armillaris ssp akineta*) and woodlands of Mallee Box (*Eucalyptus porosa*) and Native Pine (*Callitris gracilis*). It is also suspected that granite outcrops support unique assemblages of fauna species (e.g. reptiles). Important granite outcrops include Murphy's Haystack, Snaggle Rock, Cocata Hill, The Kurbla, Mt Cooper, Mt Hall, Ucontitchie Hill and Mt Wedge). There is a band of 10 to 15 granite outcrops running north to south (i.e. Murphy's – northern, Mt Wedge – southern) in the project area with many in private ownership.



Nested Assets		AUS	SA
Plant Communities	Mallee Box (<i>Eucalyptus porosa</i>) Woodlands		
Plant Communities	Native Pine (<i>Callitris gracilis</i>) Woodlands		
Threatened Reptiles	Carpet Python (<i>Morelia spilota</i>)		V
Threatened Plants	Needle-leaf Honey-myrtle (<i>Melaleuca amillaris ssp akineta</i>)		R
Threatened Plants	Sandalwood (<i>Santalum spicatum</i>)		V
Threatened Plants	Granite Mudwart (<i>Limosella granitica</i>)	VU	
Threatened Plants	Nodding Grass Liliy (<i>Stypandra glauca</i>)		VU
SPECIES ASSEMBLAGE	Mammals (Hairy-nosed Wombat, Western Grey Kangaroo, Echidna)		
SPECIES ASSEMBLAGE	Birds of Prey (Hawks, Eagles, Kites, Falcons, Kestrels)		
SPECIES ASSEMBLAGE	Reptiles (Goannas, Skinks, Dragons, Geckos, Snakes)		
KEY LOCATIONS	Murphy's Haystack, Snaggle Rock, Cocata Hill, The Kurbla, Mt Cooper, Mt Hall, Ucontitchie Hill and Mt Wedge		

3. Viability Assessment

BOX 2: Viability Assessment

This step asks you to look at each of your conservation assets carefully to determine how to measure its “health” over time. And then to identify how the asset is doing today and what a “healthy state” might look like. This step is the key to knowing which assets are most in need of management. Specific questions that this step answers include:

“How do we define ‘health’ (viability) for each of our assets?”

“What is the current status of each of our assets?”

“What is our desired status for each of our assets?”

The viability assessment process involves first identifying “key attributes” (critical aspects of ecosystem function) for each asset, then identifying indicators for each attribute (measurable aspects of the key attribute), then developing indicator rating criteria against (Poor, Fair, Good and Very Good categories; definitions below).

Asset: *Eucalypt Woodland*

Key Attribute: Fire Regime

Indicator: Percentage of woodland with acceptable fire frequency (10-15 years)

Very Good: >75% (of woodland has fire frequency of 10-15 years)

Good: 50-75%

Fair: 25-50%

Poor: <25%

Poor <i>Imminent Loss</i>	Fair <i>Vulnerable</i>	Good <i>Minimum Integrity</i>	Very Good <i>Optimal Integrity</i>
<i>Allowing the factor to remain in this condition for an extended period will make restoration or preventing extirpation practically impossible</i>	<i>The factor lies outside of its range of acceptable variation & requires human intervention. If unchecked, the target will be vulnerable to serious degradation</i>	<i>The factor is functioning within its range of acceptable variation; it may require some human intervention</i>	<i>The factor is functioning at an ecologically desirable status, and requires little human intervention</i>

The overall health of a conservation asset can usually be assessed based on 3-5 indicators carefully selected across size, condition and landscape context criteria. For example, the asset “grassy woodlands” would be considered viable or in “good” overall condition if it was ranked “good” across three or more of the following indicators:

Patch size (% of patches >1000ha in size)

Total extent (% of pre-European extent)

Vegetation structure and composition (% of total extent considered to be in “good” condition)

Fire regime (% of the total extent with fire frequency within acceptable range)

Fauna composition (& of characteristic fauna species are not threatened or declining)

3.1 Viability Assessment Results

The overall viability of the conservation assets, as assessed by the planning team, is displayed in Table 7. Viability was determined by identifying and rating the current status of the key ecological attributes of each conservation asset based on considerations of size, condition and landscape context (refer Table 6). These assessments were supported by existing monitoring data for some key ecological attributes, and in other cases were based purely on local expert opinion. The absence of quantitative data for assessing the viability of many key ecological attributes highlights a gap in the existing biodiversity monitoring program and an area for future development.

Rocky Coasts and Cliffs, Sheltered Coastal Bays, Sub-coastal Limestone Plains Mallee, Sand Mallee and Mallee Box and Native Pine Woodlands were assessed to be of good overall viability. The remainder of the conservation assets were assessed to be of fair overall viability with the exception of **Sheoak Grassy Woodlands** and **Sand Mallee Dune-top Remnants** which were assessed to be poor.

Table 6: Key Ecological Attributes of Conservation Assets

Conservation Asset	Landscape Context	Condition	Size
Sandy Coasts and Dunes	<ul style="list-style-type: none"> Coastal dune processes Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Rocky Coasts and Cliffs	<ul style="list-style-type: none"> Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Sheltered Coastal Bays	<ul style="list-style-type: none"> Water Flows / Movement Water quality 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	
Sub-coastal Wetlands	<ul style="list-style-type: none"> Hydrological regime Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Sub-coastal and Limestone Plains Mallee	<ul style="list-style-type: none"> Appropriate Fire Regime Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Sand Mallee	<ul style="list-style-type: none"> Appropriate Fire Regime Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Sand Mallee Dune-top Remnants	<ul style="list-style-type: none"> Appropriate Fire Regime Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Red Gum Woodlands	<ul style="list-style-type: none"> Hydrological regime Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Mallee Box and Native Pine Woodlands	<ul style="list-style-type: none"> Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Sheoak Grassy Woodlands	<ul style="list-style-type: none"> Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Native Grasslands / Low Sedgeland	<ul style="list-style-type: none"> Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	<ul style="list-style-type: none"> Total Area Remaining
Granite Outcrops	<ul style="list-style-type: none"> Hydrological regime Landscape connectivity 	<ul style="list-style-type: none"> Native Fauna Condition Native Flora Condition 	

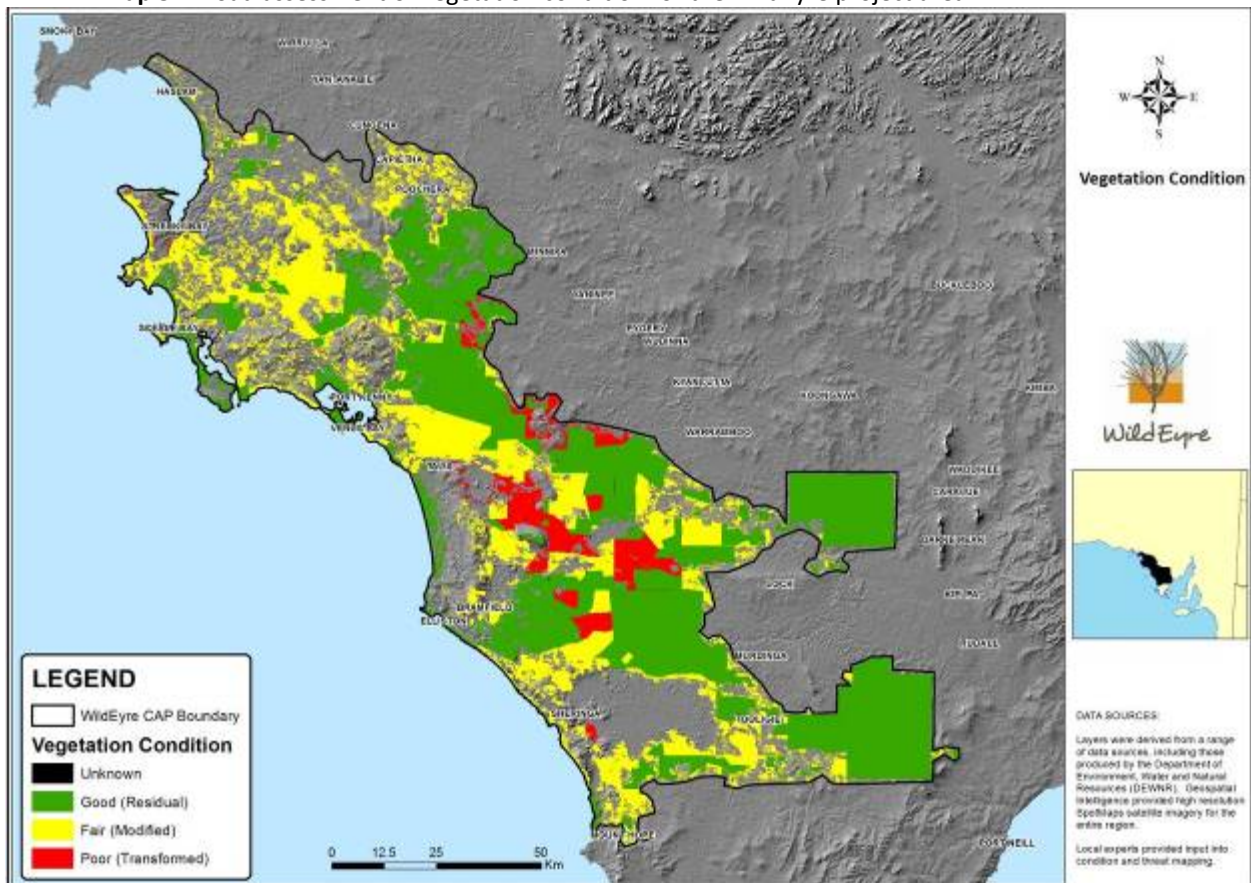
Note: Status of Key Ecological Attribute - **Poor, Fair, Good**

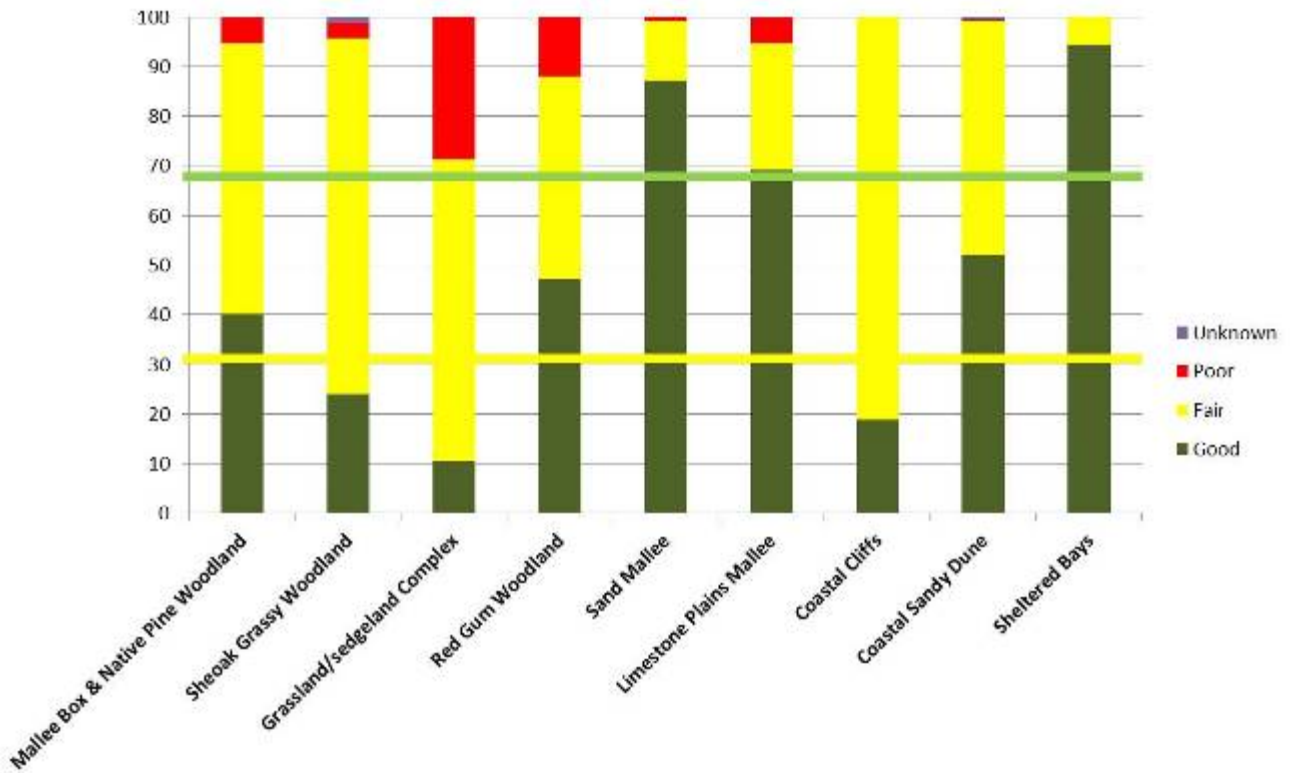
Table 7: Overall Viability Ratings for Conservation Assets

	Conservation Asset	Landscape Context	Condition	Size	Overall Viability
1	Sandy Coasts and Dunes	Fair	Fair	Good	Fair
2	Rocky Coasts and Cliffs	Good	Fair	Good	Good
3	Sheltered Coastal Bays	Good	Good	-	Good
4	Sub-coastal Wetlands	Poor	Good	Good	Fair
5	Sub-coastal and Limestone Plains Mallee	Fair	Good	Very Good	Good
6a	Sand Mallee	Fair	Good	Good	Good
6b	Sand Mallee Dune-top Remnants	Poor	Poor	Poor	Poor
7	Red Gum Woodlands	Fair	Fair	Fair	Fair
8	Mallee Box and Native Pine Woodlands	Good	Fair	Good	Good
9	Sheoak Grassy Woodlands	Fair	Poor	Poor	Poor
10	Granite Outcrops	Fair	Fair	-	Fair
Overall Landscape Viability					Fair

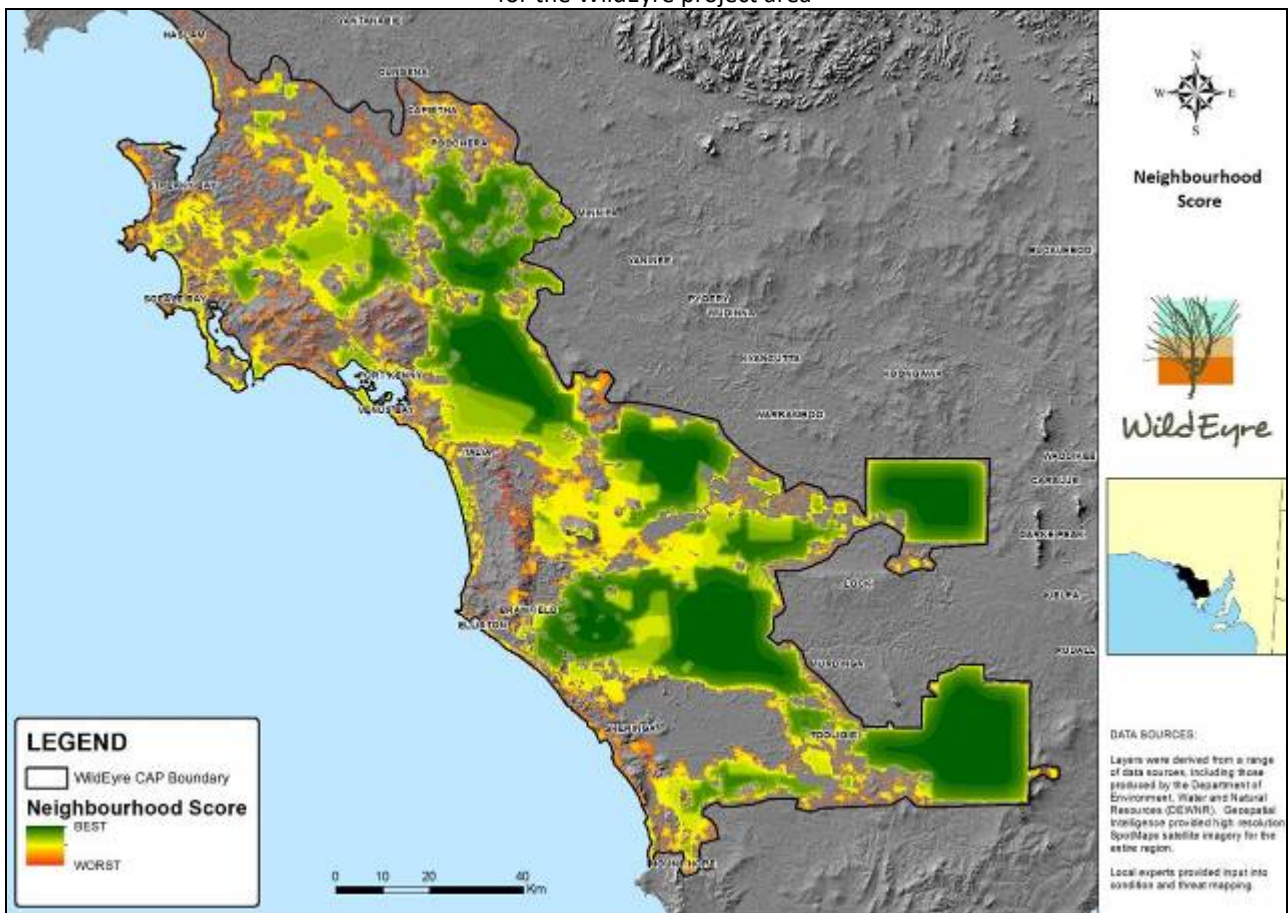
Map 5 shows a broad vegetation condition map produced during a priority area mapping project for the WildEyre region and Map 6 shows the results of landscape context analysis (Koch 2013).

Map 5: Broad assessment of vegetation condition for the WildEyre project area





Map 6: Analysis of landscape context (averaging focal statistics scores across 100m, 1km and 5km focal radii) for the WildEye project area



4. Threat Assessment

BOX 1: Threat Ranking

The third step in the conservation action planning process involves the identification and ranking of major threats to the conservation assets. The final rank is produced based on a sum of the ranks of severity, scope and irreversibility ranks as follows:

Severity of the damage where it occurs i.e. what level of damage can reasonably be expected within 10 years under current circumstances

Very High	Destroys or eliminates the conservation asset
High	Seriously degrades the conservation asset
Medium	Moderately degrades the conservation asset
Low	Slightly impairs the conservation asset

Scope of the damage i.e. what is the geographic scope of impact on the conservation asset that can be reasonably expected within 10 years under current circumstances

Very High	Very widespread (71-100% of it's occurrence)
High	Widespread (31-70%)
Medium	Localised (11-30%)
Low	Very localised (1-10%)

Irreversibility of the damage i.e. the degree to which the impacts of the threat can be reversed and the asset restored

Very High	Not reversible for all intents and purposes
High	Reversible, but not practically affordable
Medium	Reversible with a reasonable commitment of resources
Low	Easily reversible at low cost

4.2. Threats to the Conservation Assets in the WildEyre Project Area

The key threats to the conservation assets, as assessed by the planning team, are displayed in Table 8. The table shows that current dominant grazing practices (termed 'incompatible stock grazing') are considered a high threat to a number of conservation assets, as are grazing pressure from feral herbivores (eg. rabbits) and abundant kangaroos. Other high ranked threats included habitat fragmentation and encroachment of agriculture (i.e. a result of historical vegetation clearance), environmental weeds, unsustainable groundwater extraction, feral carnivores, fire management coastal development and coastal recreational access. **Sheoak Grassy Woodlands** are the most highly threatened conservation asset, followed by **Sand Mallee Dune-top Remnants**, **Red Gum Woodlands** and **Mallee Box and Native Pine Woodlands**.

Table 8: Key Threats to Conservation Assets

Threats Across Targets	Sandy Coasts and Dunes	Rocky Coasts and Cliffs	Coastal Bays	Sub-coastal wetland	Sub-coastal & Limestone Mallee	Sand Mallee	Sand Mallee Dune-tops	Red Gum Wood-lands	Mallee Box & Native Pine Wood-lands	Sheoak Wood-lands	Grass-lands	Granite Outcrop	Overall Threat Rank
Incompatible stock grazing	Medium	Medium		Medium	Low	Low	High	High	High	Very High	High	Medium	Very High
Feral herbivores (rabbit grazing)	Medium			Low	Low	Low	Medium	High	High	High	Medium	Low	High
Loss of vegetation buffers				Medium			High					High	High
Abundant native species grazing (kangaroo)					Low			Medium	Medium	High	Medium	Low	Medium
Altered hydrological regimes				Medium				High					Medium
Habitat fragmentation (historic loss of vegetation)					Low	Low	Low	Low		High			Medium
Weeds	Medium	Low	Low	Low	Low	Low	Medium	Medium	Low	Medium		Low	Medium
Feral carnivores	Medium	Low	Low	Low	Medium	Medium	Medium	Low			Low	Low	Medium
Coastal development	Medium	Medium	Low										Medium
Unmanaged recreational access and commercial activities (e.g. abalone farmers)	Medium	Medium	Low										Medium
Fire management / suppression (lack of mosaic, patchy burns)					Medium	Medium							Medium
Honey Bees					Low								Low
Introduced Starlings					Low								Low
Mining exploration					Low								Low
Over use of marine resources (fishing, cockles)			Low										Low
Threat Status	Medium	Medium	Low	Medium	Medium	Medium	High	High	High	Very High	Medium	Medium	Very High

5. WildEyre Goals and Objectives

Conservation objectives have been developed by the WildEyre planning group to address the medium and high ranked threats to the conservation assets (refer Table 8). Three foundational objectives are also presented in this section. Foundational objectives underpin the development and successful implementation of landscape-scale projects and address funding, community engagement and knowledge gaps.

Objectives are developed in accordance with the S.M.A.R.T principles (i.e specific, measurable, attainable, realistic and time-bound) and are aimed at addressing high priority threats or achieving improvements in size, condition and landscape context attributes.

An analysis of the formal protection status of each conservation asset (ie. within conservation reserves and private Heritage Agreements) has also been undertaken to help set numerical area targets for conservation objectives (refer Table 9). The analysis is based on the simplified 30-50% vegetation cover principle as outlined in Section 5.1 above.

5.1 Foundational Goals (2017 to 2020)

The following diagram articulates key success factors for the WildEyre program over the next three years (2017 to 2020).



5.2 Conservation Objectives

Coastal Sustainable Recreational Access Objective:

By 2020, at least ten priority fauna breeding sites (Ospreys, White-bellied Sea Eagles, Hooded Plovers, Pied Oystercatchers) in high value coastal areas have adequate protection (sufficient to enable acceptable level of breeding success) from inappropriate recreation activities.

Coastal Weed Control Objective:

By 2017, treat all infestations of African Boxthorn and Italian Buckthorn in coastal conservation areas and maintain at low levels through followup control and private landholder engagement.

Coastal Sustainable Development Objective:

Ensure coastal development is maintained at low levels and is restricted to environmentally sensitive designs and locations by 2025

Revegetation Buffers and Linkage Objectives:

By 2025, revegetate 12000 hectares of Sheoak Grassy Woodlands on non-regenerative sites to buffer sub-coastal wetlands, establish key landscape linkages and ensure adequate patch size and total area.

By 2025, buffer all granite outcrops greater than 1 hectare through 500 hectares of revegetation to conserve a unique habitat type and landform.

By 2020, reconnect Hincks Conservation Park to Barwell Conservation Park, establishing at least 500ha of sand mallee habitat (with spinifex understorey where possible) for ground-dwelling fauna such as Sandhill Dunnart and Malleefowl.

Sustainable Stock Grazing Objectives:

By 2020, achieve landscape-scale control of total grazing pressure (roos, rabbits and stock) across 3 priority sublandscapes to achieve measurable improvement of BCM scores and regeneration of **Sheoak Grassy Woodlands** (5000 ha), **Red Gum Woodlands** (1000 ha) and **Mallee Box and Native Pine Woodlands** (2000 ha), plus 5 priority West Coast Mintbush sites.

Hydrological Regimes Objective:

Ensure groundwater extraction is maintained at levels required to maintain healthy Red Gum Woodlands (canopy health within natural range of variation) by 2020

Ecological Fire Regimes Objective:

Ongoing maintenance of suitable fire regimes in mallee communities to minimise the risk of large fires destroying threatened species populations, encourage the regeneration of fire dependent plants and provide a mosaic of habitat at different successional stages

Feral Carnivore Control Objective:

By 2020 maintain fox-baiting and cat-control methods at level required to achieve viable (desired distribution and increasing in abundance) of shorebirds, malleefowl and other predation-sensitive fauna at at least five high priority sites

Feral Herbivores Objective:

By 2020, control rabbits to the level required to optimise regeneration of West Coast Mintbush and have adequate protection measures in place for all new revegetation sites. Develop effective solutions for minimising the impact of kangaroos on revegetation sites by 2017.























Formal Protection of Under-represented Ecosystems Objective:

By 2012, restore & secure long term protection (private land agreements, formal reserves) for an additional 1,300 ha of the high quality Sheoak Grassy Woodlands, 2,000 ha of high quality, threatened species habitats within Red Gum Woodlands, and 10,000 ha of high quality Native Pine & Mallee Box Woodlands to ensure an adequate network of protected areas.

6. Conservation Strategies and Actions






This section presents the conservation strategies and action steps developed by the planning team to achieve the foundational goals and conservation objectives identified in Section 5. It also orders the objectives, strategies and actions steps into program areas which reflect the implementation approach taken by on-ground operational teams. An indication of the progress made toward achieving the objective is also given in this section through the use of the terms **On Track** or **Completed** next to the Action Steps (if applicable).

6.1. FOUNDATIONAL PROGRAM (2017 to 2020)

Actions and Activities	Progress
 Ongoing indigenous engagement program providing varied opportunities for employment and involvement	Not Specified
 Rewilding projects to restore important ecosystem functions in progress	Not Specified
 Promote WildEyre as an ideal site for state & national rewilding projects	Not Specified
 Pursuit funding partnerships and trial innovative species control technologies	Not Specified
 Commence reintroduction projects for functionally important native species	Not Specified
 Strong funding base with a mix of ecosystem services trading, government, corporate and private donors	Not Specified
 Review and refine WildEyre Investment Prospectus	On-Track
 Launch WildEyre video and invite potential funding partners	On-Track
 Secure EPBC-listing for Sheoak Grassy Woodlands	On-Track
 Include WildEyre priority projects in GA national southern funding campaign	On-Track
 Local and state funding campaign aimed at EP corporates, philanthropic organisations and potential donors	Not Specified
 Training for local staff in developing funding partnerships	Not Specified
 Identify and engage potential local corporate partners and donors	Not Specified
 Develop tailored funding proposals for donors as required	Not Specified
 Develop viable carbon funding models and implement innovative carbon-funded projects	Not Specified
 Strong public profile and community engaged in project activities	Not Specified
 Update WildEyre website with project achievements, monitoring outcomes, video, webmap etc.	On-Track
 Develop flagship citizen science projects with strong WildEyre association	Not Specified
 Engage high school students in WildEyre activities	Not Specified
 Promote WildEyre through websites, regular events and media releases and social media	Not Specified
 Strong sustainable grazing program with broad adoption of innovative farming practices	Not Specified
 Well thought out climate adaptation strategies in place	Not Specified

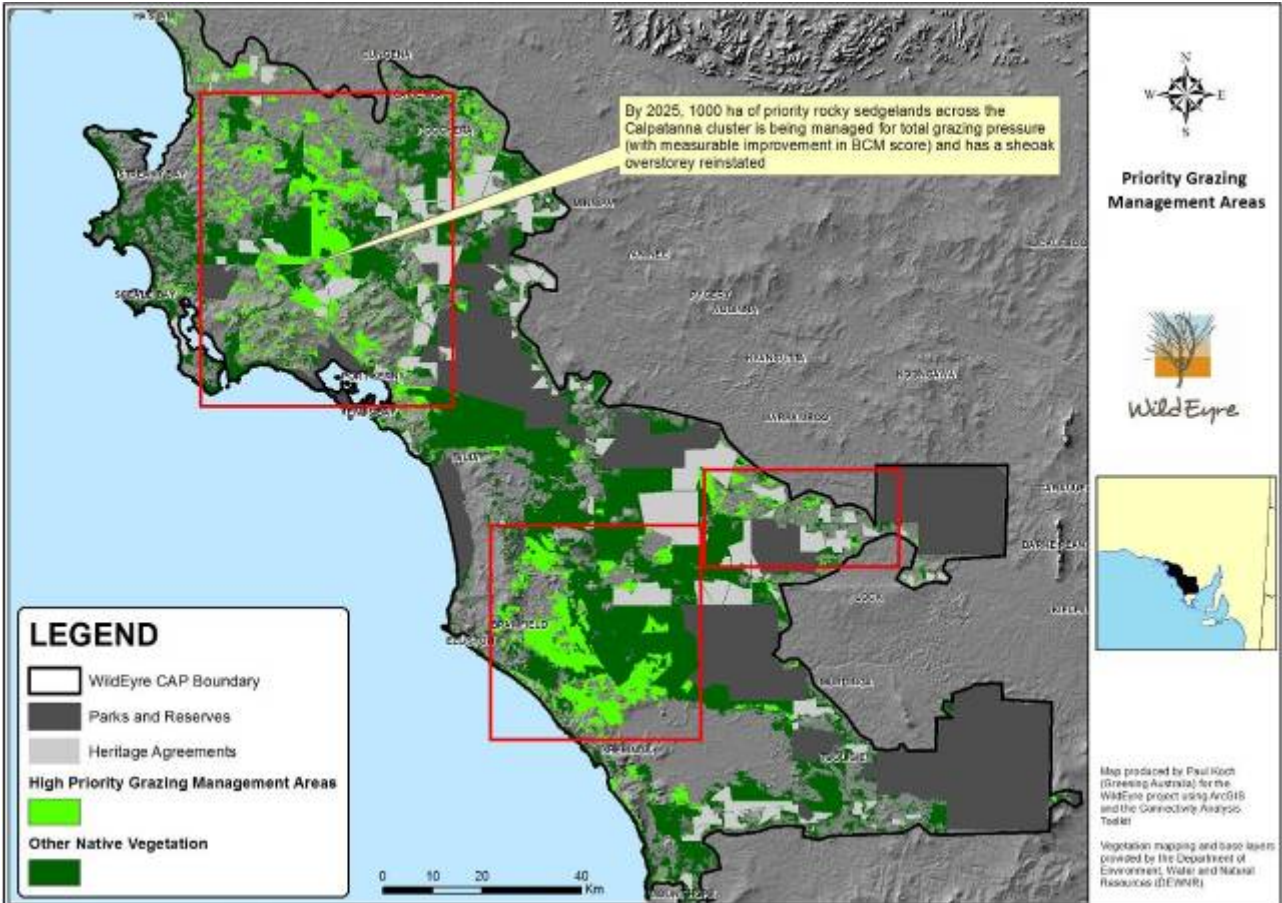
6.2. SUSTAINABLE STOCK GRAZING PROGRAM

Objective: By 2020, achieve landscape-scale control of total grazing pressure (roos, rabbits and stock) across 3 priority sublandscapes to achieve measurable improvement of BCM scores and regeneration of **Sheoak Grassy Woodlands** (5000 ha), **Red Gum Woodlands** (1000 ha) and **Mallee Box and Native Pine Woodlands** (2000 ha), including five priority West Coast Mintbush sites.

Actions and Activities	Progress
 SUSTAINABLE STOCK GRAZING PROGRAM	
 Landscape planning, mapping and prioritisation for grazing management	On-Track
<input type="checkbox"/> Improve mapping of Sheoak grassy woodlands and Red Gum woodlands	Not Specified
<input type="checkbox"/> Develop vegetation condition layer and stock grazing threat severity layer and integrate with CAP and BCM monitoring	Completed
<input type="checkbox"/> Mapping of priority grazing management sites based on threat severity and conservation significance	Completed
<input type="checkbox"/> Develop states and transitions model for key vegetation communities linked to grazing management (link with BCM monitoring)	On-Track
<input type="checkbox"/> Develop factsheet for landholders based on existing knowledge around best practices for grazing in grassy ecosystems.	On-Track
 Engage key stakeholders and obtain funding for implementing sustainable stock grazing program	Scheduled
<input type="checkbox"/> Develop a grant to run a landholder engagement, training and incentives program	Not Specified
 Implement landholder engagement, training and incentives program for sustainable grazing management	On-Track (17000 ha of vegetation protected and mapped)
<input type="checkbox"/> Consult with land managers to understand attitudes and potential barriers to changing stock grazing regimes	On-Track
<input type="checkbox"/> Identify and promote regional case studies of best practice grazing management in grassy woodland systems	On-Track
<input type="checkbox"/> Develop and run practical landholder training courses in sustainable stock grazing in grassy ecosystems using demonstration sites	Not Specified
<input type="checkbox"/> Provide ongoing specialist extension support for landholders and targeted farming system groups in priority areas (e-parf and agricultural bureaus)	Not Specified
<input type="checkbox"/> Provide financial incentives and technical support to targeted landholders for new fencing, waterpoints etc.	Not Specified
<input type="checkbox"/> Engage Native Vegetation Council to approve land management agreements that enable landholders to adopt sustainable grazing without fear of "5 year rule"	Not Specified
<input type="checkbox"/> Improve fencing of high conservation value parks	Not Specified
 Develop and implement long term grassy ecosystems monitoring program that tracks improvement in biodiversity condition and production values	Not Specified

Actions and Activities	Progress
<input type="checkbox"/> Develop monitoring plan linking BCM and Bird monitoring as key performance	Completed
<input type="checkbox"/> Develop results chain for grazing management program to identify any additional	Completed
<input type="checkbox"/> Update monitoring plan to include additional key performance indicators for grazing	On-Track
<input type="checkbox"/> Implement additional monitoring against identified KPIs once grazing management program is commenced	Not Specified

Map 7: Priority grazing management areas, including subobjective for priority linkage area in Calpatanna Waterhole area.




















6.3 REVEGETATION BUFFERS AND LINKAGES PROGRAM

Objective: By 2025, revegetate 12,000 hectares of **Sheoak Grassy Woodlands** on non-regenerative sites to buffer sub-coastal wetlands, establish key landscape linkages and ensure adequate patch size and total area.

Objective: By 2020, buffer all **granite outcrops** greater than 1 hectare through 5,00 hectares of revegetation, primarily mallee box and native pine woodlands, to conserve a unique habitat type and landform.

Objective: By 2020, reconnect Haimbidge Conservation Park to Barwell Conservation Park, establishing at least 500ha of **sand mallee** habitat (with spinifex understorey where possible) for ground-dwelling fauna such as Sandhill Dunnart and Malleefowl.

Actions and Activities	Progress Summary
 Revegetation buffers and linkages program	On-Track (approx. 1317 ha revegetated)
 Landscape planning, mapping and prioritisation for revegetation	On-Track
 Identify and map priority areas for revegetation buffers and linkage areas	Completed
 Map pre-European vegetation types across WildEyre	Completed
 Map all rocky areas and other areas with high regenerative capacity and integrate into priority area mapping (linkages mapping)	Completed
 Define revegetation objectives and key performance indicators against SERA national restoration standards and 5 star rating system and link with BCM indicators	Completed
 Identify public reserves and other available lands potentially compatible with revegetation/ regeneration	On-Track
 Develop scoping reports for high priority sites	On-Track
 Develop one subjective for each landscape linkage area	On-Track
 Develop best practice guidelines for revegetation and determine necessary innovations and capacity building initiatives	On-Track
 Set up excel database with species mix appropriate to each vegetation type, seed requirements (weight) etc.	Completed
 Identify priority species (structurally/compositionally important but problematic species) for research & development.	Not Specified
 Develop specific best practice revegetation guidelines document/database for each vegetation community and identify key knowledge gaps	Not Specified
 Undertake local seed collection, seedbank management and nursery development to support revegetation	On-Track
 Investigate the development of a new seed production area for grassy groundcovers	Not Specified
 Investigate WOPR program for Sheoak & Native Pine and Mallee Box woodland restoration (and implement trial if feasible)	Not Specified
 Assess the cost-effectiveness of WOPR and alternative delivery models against the achievement of 3 star and 5 star sites	Not Specified

<input type="radio"/> Pull together available information on best practice kangaroo control methods and integrate with site management plans	On-Track
<input type="radio"/> Undertake carbon analysis of the landscape to identify opportunities for future carbon offset funding	On-Track
<input type="radio"/> Implement trial to establish the cost-effectiveness of various kangaroo deterrent options at revegetation sites	On-Track
<input type="radio"/> Develop states and transitions model for the revegetation of Sheoak Grassy Woodlands	Completed
<input checked="" type="radio"/> Obtain funding for implementing revegetation program	On-Track
<input checked="" type="radio"/> Chain Of Bays and Lake Newland wetland buffers	On-Track
<input type="radio"/> Undertake full-cost revegetation of buffers on available public land in priority areas and ensure results with site maintenance	On-Track
<input type="radio"/> Identify and implement initial pilot high quality "5 star" revegetation project	On-Track
<input type="radio"/> Develop site management plans for major revegetation sites and ensure land management agreements are in place	On-Track
<input type="radio"/> Identify and engage key landholders to understand their attitudes and potential barriers to implementation	On-Track
<input type="radio"/> Ongoing, specialist extension support for landholders in priority areas to develop/implement site-based plans	On-Track
<input type="radio"/> Provision of appropriate financial incentives for private landholders in priority areas to undertake revegetation and encourage regeneration	On-Track
<input checked="" type="radio"/> Develop site monitoring plans for individual sites and link to landscape scale indicators of success	On-Track
<input type="radio"/> Develop results chain to identify measures of success	Completed
<input type="radio"/> Develop monitoring plan for revegetation program	Completed
<input type="radio"/> Ongoing site monitoring and evaluation. Adjust site management plans and undertake maintenance as required	On-Track

Table 10 shows the results of a workshop process prioritising among eight landscape linkage areas in terms of revegetation suitability for sheoak grassy woodland (see Maps 8) according to the following agreed criteria: Biodiversity Benefits, Feasibility Criterion 1 (amount of grazing land vs cropping land), Feasibility Criterion 2 (landholder interest), Feasibility Criterion 3 (amount and quality of rocky sedgelands in linkage area). The Chain of Bays and Bascombe Well to Kaliparu linkage areas emerged as the highest priority areas for revegetation of sheoak grassy woodland because they scored well both in terms of existing biodiversity values and across feasibility factors.

Map 8: High priority revegetation areas to expand, link and reconnect focal vegetation communities (Koch 2013) with linkage area subobjectives developed during recent workshops for high priority areas (refer to Table 10).

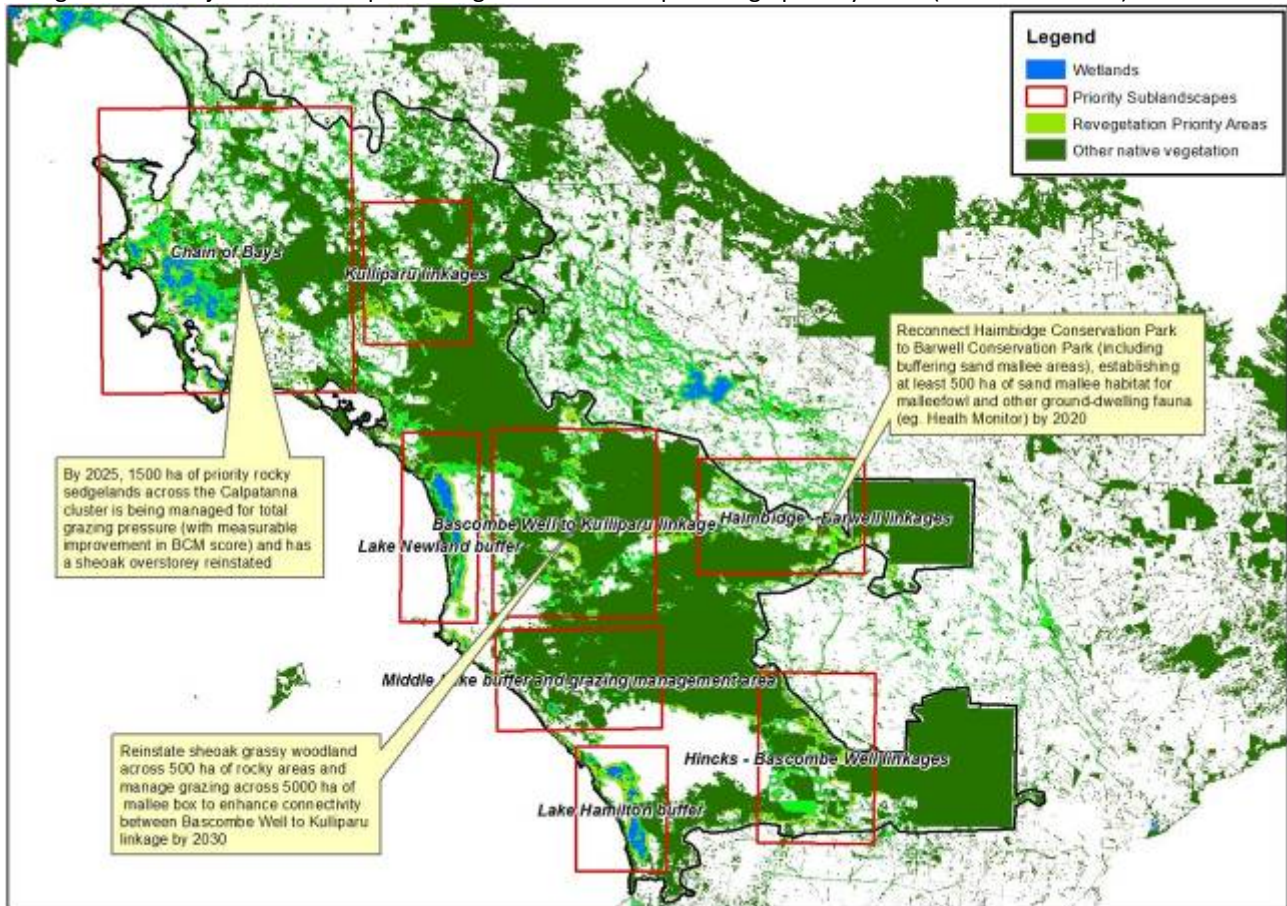
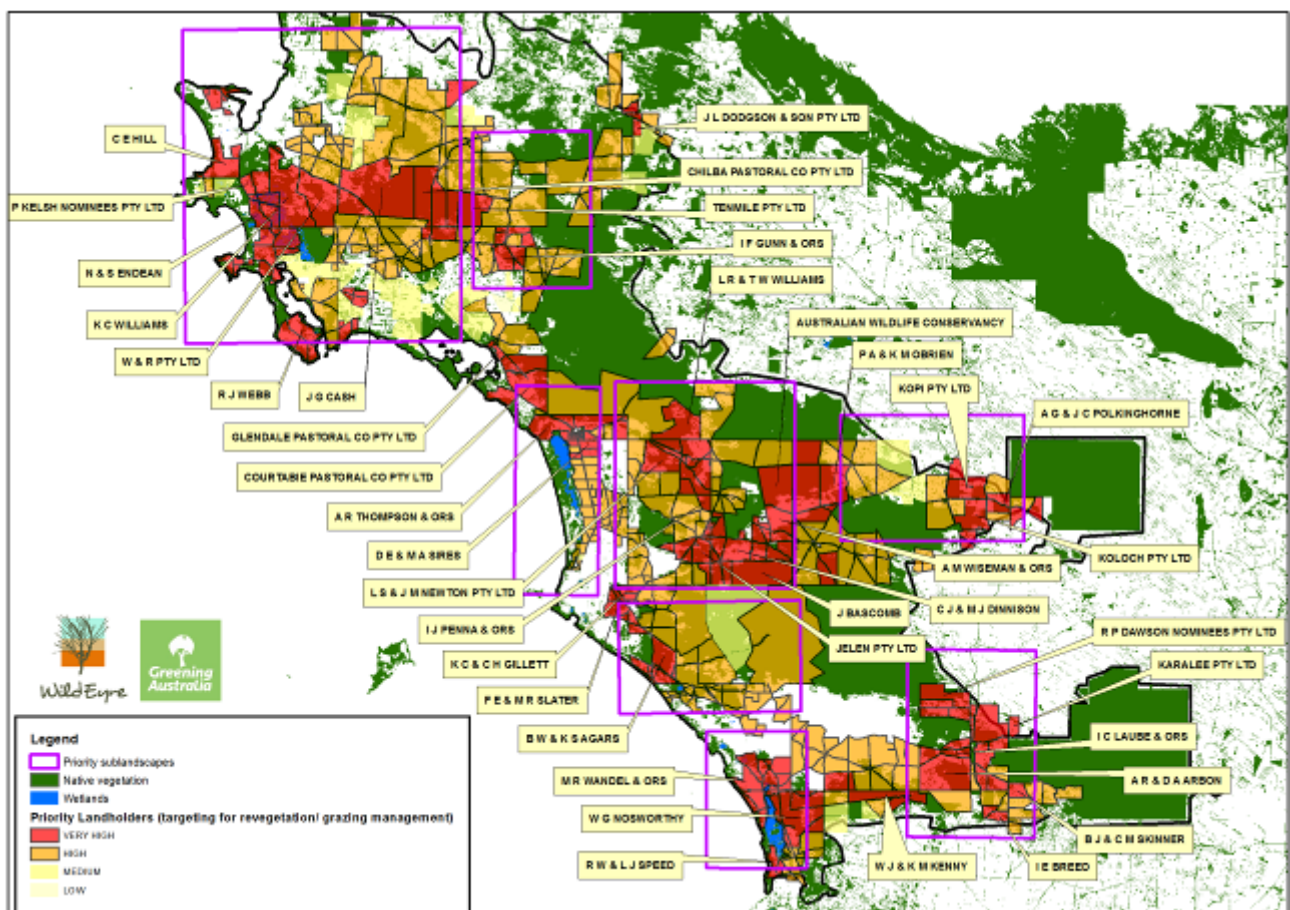


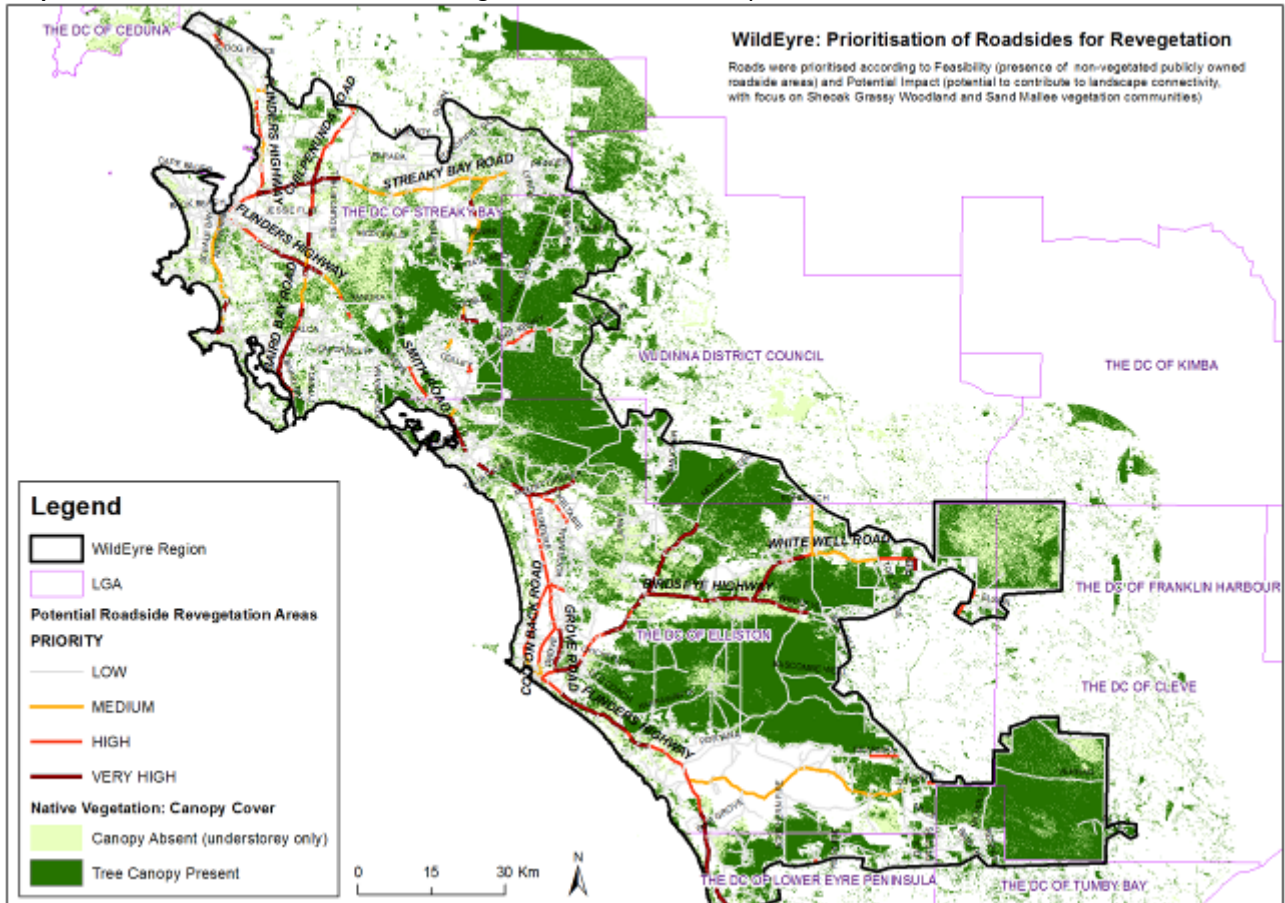
Table 10. Prioritisation of landscape linkage areas for sheoak grassy woodland revegetation (in conjunction with grazing management).

Linkage Area	BENEFITS: biodiversity values associated with area (sheoak & grassland remnancy, focal threatened sp., wetlands, granite buffers etc.)	FEASIBILITY/ OPPORTUNITY FACTORS			OVERALL PRIORITY	Rank
		Land use change feasibility (how much cropping land in target area)	Landholder interest level	Site suitability (how much rocky sedgeland area with partial understorey occurs in target area)		
Chain of Bays	VH	H-M	H	VH	VH	1
Bascombe Well to Kalliparu	H	VH	M	VH	H-VH	2
Lake Newland	H-VH	H	H	H	H	3
Lake Hamilton	L	H	H	H	H	3
Hincks – Bascombe Well	H	M	M	H	M-H	4
Kalliparu	M	L	H	L	M	5
Middle Lake	L	H	H	L	M	5
Haimbidge to Barwell	H	L	M	L	M	5

Map 9: Prioritisation of landowners for engagement in revegetation and grazing management associated with Sheoak Grassy Woodlands. Relevant landowners were ranked on a four-point scale from Very high to Low based on property size, strategic importance and favourability of condition states for revegetation (see Map 10).
















Map 10: Prioritisation of roadsides for revegetation of Sheoak Grassy Woodlands.







6.4. COASTAL PROGRAM: Coastal Weed Control

Objective: By 2017, treat all infestations of African Boxthorn and Italian Buckthorn in coastal conservation areas and maintain at low levels through followup control and private landholder engagement.

Actions and Activities	Progress Summary
 Protect high value coastal areas from boxthorn and other weed infestations	On-Track
 Develop targeted weed management strategies and monitoring plans for priority weed species	On-Track
 Develop boxthorn control strategy and monitoring plan	Completed
 Trial helicopter application of grazlan for boxthorn control	Completed
 Identify priority sites and develop strategy for the control of other priority weeds (eg. Italian Buckthorn and Bridal Creeper)	Completed
 Determine funding sources and obtain funding for the coastal weed control program	On-Track
 Implement Boxthorn Management Plan and control emerging weed threats	On-Track
 Implement African Boxthorn Management Plan (includes 16 management areas)	On-Track
 Control emerging weed threats (eg. Italian Buckthorn, Bridal Creeper) at priority sites	On-Track
 Ongoing evaluation of boxthorn density, emerging weed threats and reinfestation levels	On-Track
 Pre and post control monitoring of boxthorn density in accordance with boxthorn management plan	On-Track
 Ongoing monitoring for weed reinfestation and follow-up control	On-Track
 Monitor priority sites (infestation prone areas) for emerging weed threats	On-Track





6.5. COASTAL PROGRAM: Sustainable Development

Objective: Ensure coastal development is maintained at low levels and is restricted to environmentally sensitive designs and locations by 2025

Actions and Activities	Progress Summary
 Restrict coastal development in priority areas	On-Track
 Determine "ecologically sensitive" and "less sensitive" coastal areas	On-Track
 Map ecologically sensitive areas based on threatened flora and fauna values (WB Sea Eagle, Osprey, shorebirds)	Completed
 Work with planning approvals agencies where/as required to restrict coastal development in ecologically sensitive areas	Not Specified

6.6. COASTAL PROGRAM: Managing Recreation Impacts

Objective: By 2020, at least 10 priority fauna breeding sites (Ospreys, White-bellied Sea Eagles, Hooded Plovers, Pied Oystercatchers) in high value coastal areas have adequate protection (sufficient to enable acceptable level of breeding success) from inappropriate recreation activities.






Actions and Activities	Progress Summary
 Manage recreational impacts to sensitive coastal fauna	On-Track
 Map priority areas for restricting recreational access based on values for sensitive species and threat severity	On-Track
 Consult with Jane Cooper to map high value and high impact coastal areas for shorebirds and other fauna	Completed
 Consult with WildEyre team and coastcare officers to map priority areas for implementing recreational policy and infrastructure changes	Completed
 Develop detailed action plan for restricting recreational access at priority sites	Completed
 Consult with Birdlife Australia staff in Victoria to develop a pilot community shorebird monitoring program on the Eyre Peninsula	On-Track
 Review access management strategy developed (but not implemented) by District Council of Streaky Bay	Not Specified
 Determine funding sources and obtain funding for the coastal recreation management program	On-Track
 Work with coastal land managers to implement infrastructure changes and access restrictions wherever possible	Not Specified
 Engage with local communities at priority sites to establish shorebird monitoring program and increase community support for access restrictions	Not Specified
 Install signs, temporary fencing, barriers etc. at priority sites	On-Track
 Progressive implementation of coastal access management strategy developed for Streaky Bay DC	Not Specified
 Lobby state government to purchase Point Gibson and establish new conservation park with restricted access	Not Specified
 Establish shorebird monitoring program that evaluates the success of recreation infrastructure and policy changes	On-Track
 Establish ongoing monitoring of shorebirds (including Hooded Plovers and Pied Oystercatchers) focussed on measuring breeding success	On-Track

Map 11: Priority Areas for Managing Coastal Recreational Impacts (revised May 2015)









6.7 HYDROLOGICAL REGIMES PROGRAM

Objective: Ensure groundwater extraction is maintained at levels required to maintain healthy Red Gum Woodlands (canopy health within natural range of variation) by 2020

Actions and Activities	Progress Summary
 Support implementation of the Water Allocation Plan for the Polda Basin (sustainable groundwater use program) to conserve Red Gum Woodlands and Sub-coastal Wetlands	On-Track
 Review Water Allocation Plan for the Polda Basin and identify any emerging threats related to groundwater extraction	On-Track
 Lobby for Red Gum requirements to be considered in Water Allocation Plan for the Polda Basin	Completed
 Ongoing monitoring of Red Gum health and recruitment	Not Specified
 Monitor the health of Red Gum trees at existing BCM sites using established methodology (ongoing)	Not Specified

6.8 ECOLOGICAL FIRE REGIMES PROGRAM

Objective: By 2017, maintain suitable fire regimes in mallee communities to minimise the risk of large fires destroying threatened species populations, encourage the regeneration of fire dependent plants and provide a mosaic of habitat at different successional stages

Actions and Activities	Progress
 Determine and implement appropriate fire regimes	On-Track
 Determine the suitability of current fire regimes in comparison to ecological requirements and develop a workable fire management plan for the region	Completed
 Meet with local fire management staff to understand current fire management practices in relation to	Completed
 Develop list of potentially "at-risk" flora and fauna species that may require more or less frequent burning	Completed
 Identify "special protection zones" by overlaying maps of fire sensitive species and habitats and provide to fire management personnel	On-Track
 Provide input into prescribed burn plans as required	On-Track

Map 12: Fire age class distribution for native vegetation of the WildEyre region.

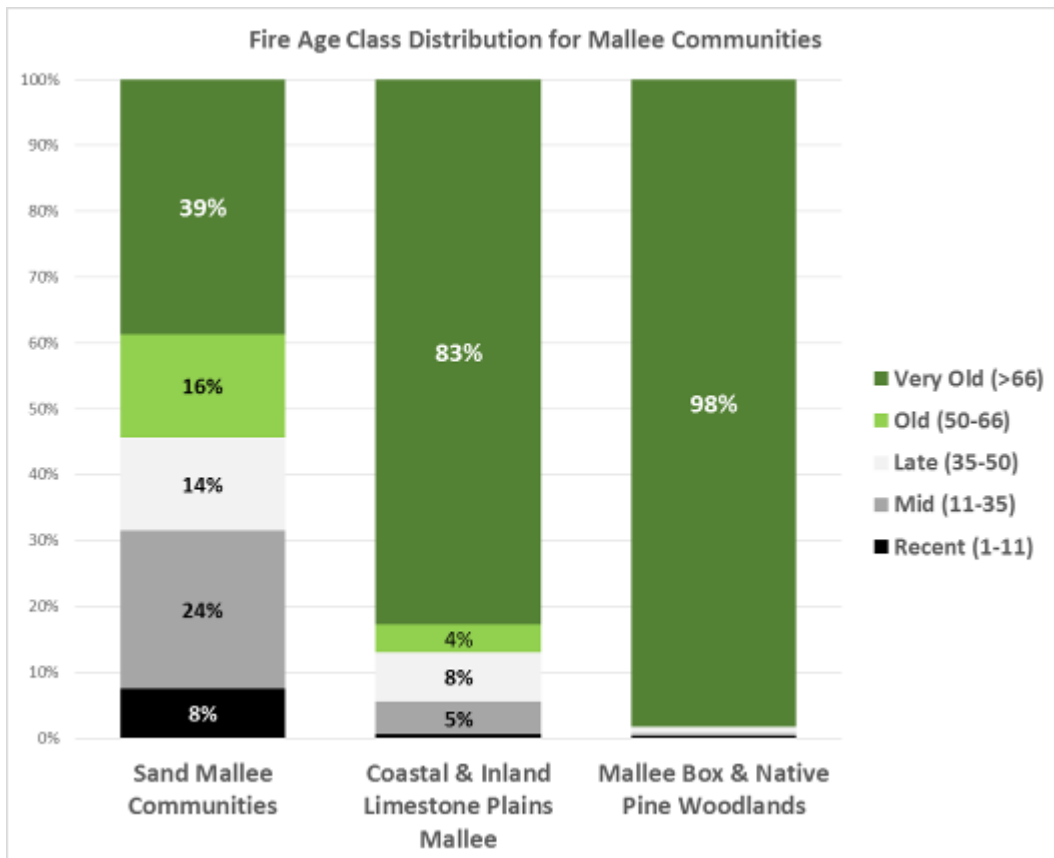
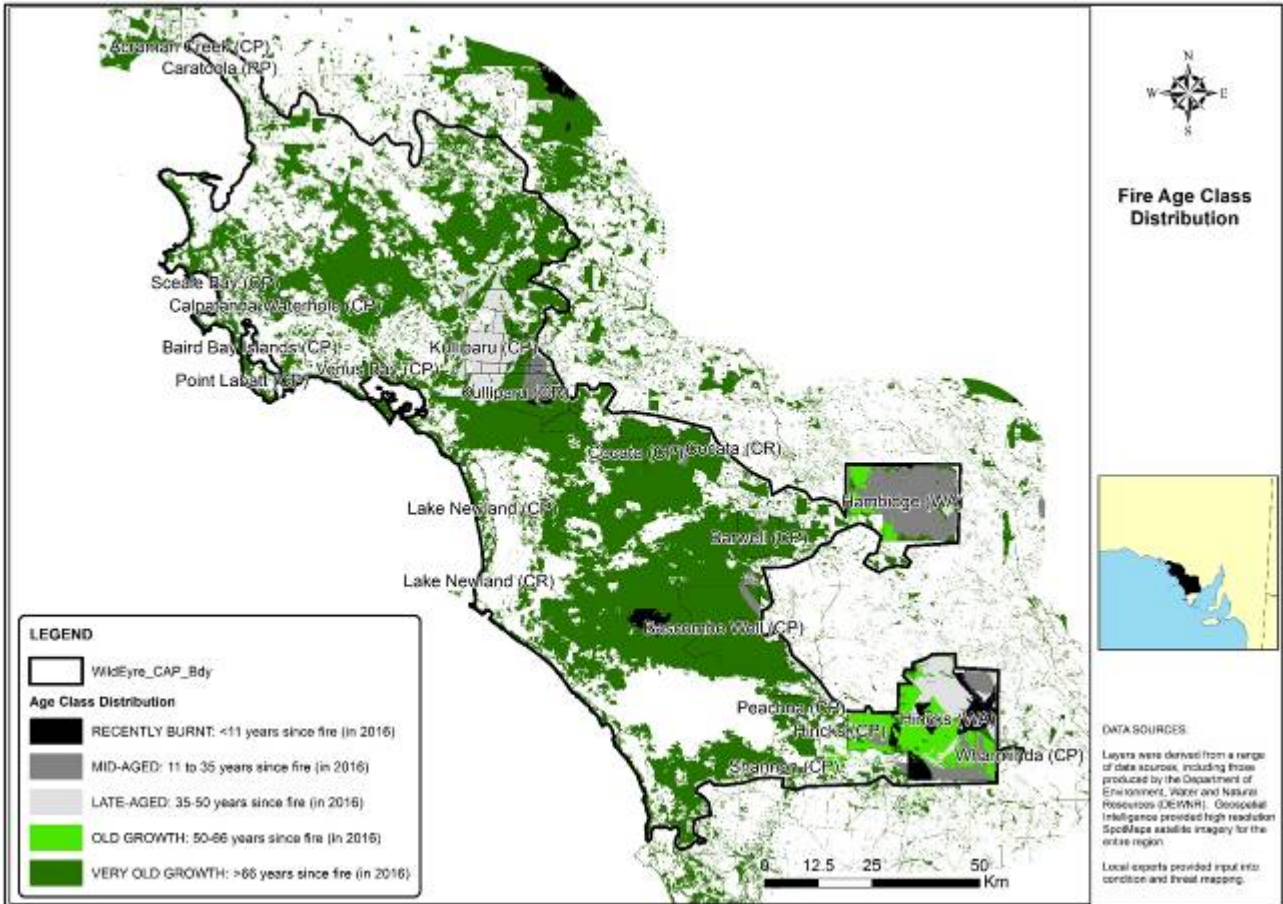


Figure 2. Age class distribution for relevant assets (vegetation groupings) of the WildEyre region.

6.9 FORMAL PROTECTION OF UNDER-REPRESENTED ECOSYSTEMS

Objective: By 2025, long term, formal protection (private land agreements, formal reserves) of 1,300 hectares of Sheoak Grassy Woodlands, 6,500 hectares of coastal dunes and cliffs, 4,500 hectares of sub-coastal wetlands, 2,000 hectares of Red Gum Woodlands and 60,000 hectares of mallee box and native pine woodlands, with priority to high quality, representative areas that support threatened species habitat and key landscape linkages.






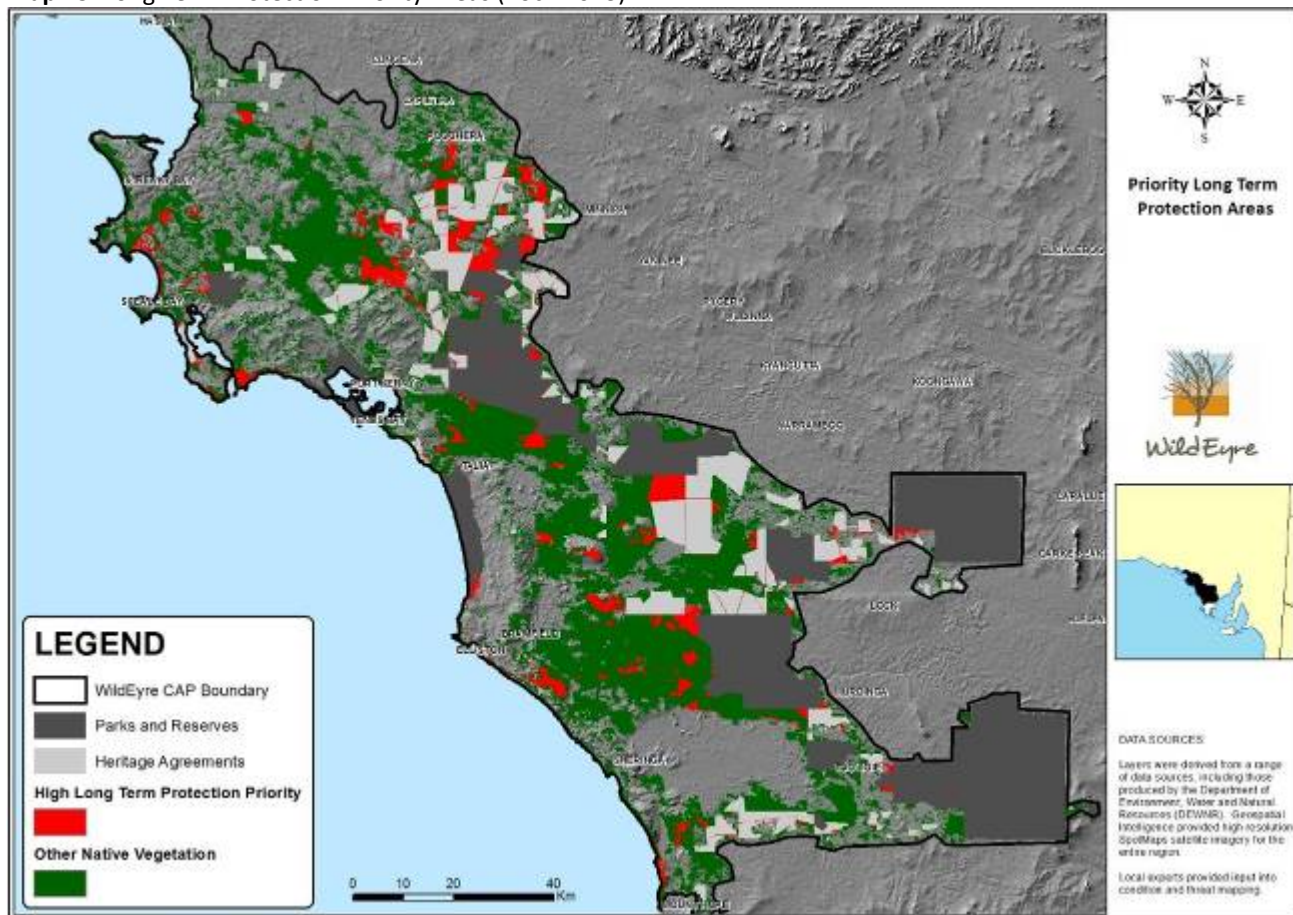
Actions and Activities	Progress
 Targeted long term protection program for high value habitats	Not Specified
 Map priority areas and identify target landholders	On-Track
<input type="checkbox"/> Initial mapping of high priority areas based on value for threatened species and depleted communities and vegetation condition	Completed
<input type="checkbox"/> Identify target landholders associated with high value land parcels	On-Track
 Obtain funding for implementing targeted formal protection program	Not Specified
<input type="checkbox"/> Apply for grant to continue funding for the project	Not Specified
 Implement targeted formal protection program	Not Specified
<input type="checkbox"/> Run initial project development workshops with community representatives to understand and overcome barriers to implementation	Not Specified
<input type="checkbox"/> Discuss with key land managers of priority sites long term private land protection options (formal reserve acquisition, heritage agreements, stewardship payments,	Not Specified
<input type="checkbox"/> Work with DEWNR and NGOs (AWC, Nature Foundation, etc) to purchase properties if made available	Not Specified
<input type="checkbox"/> Implement stewardship payment program for private landholders to put high value areas under long term protection	On-Track
 Monitor improvements in vegetation condition and link to bird monitoring	Not Specified

Table 9: Protected Area Analysis of WildEyre Conservation Assets

Conservation Asset	Total Area (ha)	DENR Reserves (ha)	Heritage Agreement (ha)	DENR & HA (ha)	DENR & HA (%)	30% Target (ha)	Gap (ha)
Coastal Sandy Dunes	21,032	3,964	944	4,909	23	6,310	1,401
Coastal Cliffs	1264	0	55	55	4	379	324
Sheltered Bay Vegetation	342	50	0	50	15	103	53
Sub coastal Wetlands	15,190	2,776	175	2,951	19	4,557	1,606
Coast and Inland Limestone Mallee	351,868	123,488	72,276	195,764	56	105,560	-90,204
Sand Mallee Communities	77,838	60,400	6,371	66,771	86	23,351	-43,419
Red Gum Floodplain Woodlands	4,148	606	239	845	20	2,074*	400
Mallee Box / Native Pine Woodlands	199,087	34213	17,019	51,232	26	59,726	8,494
Sheoak Grassy Woodlands	2669	182	7	189	7	1,335*	1,146
Native Grasslands / Low Sedgeland	57,084	265	1,656	1,921	3	17,125	15,204
Unallocated	7,297	994	249	1,243	17	2,189	946
Total	737,819	226,939	98,992	325,930		221,346	






*Note: 50% target used for highly depleted assets

Map 13: Long Term Protection Priority Areas (Koch 2013)






















6.10 FERAL CARNIVORE CONTROL PROGRAM

Objective: By 2020 maintain fox-baiting and cat-control methods at level required to achieve viable (desired distribution and increasing in abundance) of shorebirds, malleefowl and other predation-sensitive fauna at five high priority sites

Actions and Activities	Progress
 8.0. Cross-tenure feral predator baiting and control program	On-Track
 8.1 Identify priority areas for fox and cat control and develop long term, landscape scale control strategy	Not Specified
<input type="checkbox"/> Identify fauna species most threatened by foxes and cats	Completed
<input type="checkbox"/> Review the status of WildEyre malleefowl population and the relative importance of primary threats in conjunction with national Malleefowl	Not Specified
<input type="checkbox"/> Determine the relative importance of foxes and cats in the region on threatened fauna species	Not Specified
<input type="checkbox"/> Review best practices for fox and cat control and develop costed landscape-scale control strategy	Not Specified
<input type="checkbox"/> Map priority areas for fox and cat control based on the distribution of predation-sensitive fauna	Not Specified
 8.2 Obtain funding for implementing the feral predator control strategy	On-Track
 8.3 Implement cross-tenure feral predator control in priority areas	On-Track (TAG): 2000 ha of fox and cat control completed
<input type="checkbox"/> Implement Targeted Area Grants project in the Chain of Bays area	Completed
<input type="checkbox"/> Trial innovative new cat control technologies.	Completed
 8.4 Establish monitoring program for predation-sensitive fauna to evaluate the impact of control efforts	Not Specified

6.11 FERAL AND ABUNDANT NATIVE HERBIVORE CONTROL PROGRAM

Objective: Achieve a sustained and measurable reduction in total grazing pressure impacts (esp. roos, stock and rabbits) across 1000ha of Sheoak woodland, 500 ha of Red Gum woodland and 5000 ha of Mallee Box woodland by 2025

 9.0. Exotic and over-abundant herbivore control program
 Identify priority areas for rabbit and kangaroo control and develop long term, cross-tenure control strategy
 Analyse existing data from kangaroo surveys and repeat the survey to document population changes
 Rapid assessment survey or research to determine the relative importance of roads, proximity to vegetation and watering points as drivers of kangaroo abundance/ browsing pressure
 Identify priority areas for rabbit control based on understanding of high impact areas, key fauna and flora habitats, landscape connectivity, ability of land to recover and likely landholder willingness
 Conduct aerial surveys to determine the severity of emerging feral herbivore threats such as deer
 Engage commercial roo harvesters and identify strategies to improve profitability
 Determine whether additional funding is required for successful implementation and seek funding as required
 Implement cross-tenure control program in priority areas
 Document total grazing pressure impacts of kangaroos on agriculture and promote to broader community
 Revegetate Cape Radstock (an area that acts like an island where kangaroos can be kept in very low numbers)
 Highly targeted rabbit and integrated pest control program focussing on high priority sites eg. West Coast Mintbush
 Contact BiosecuritySA (Skippy) and determine whether there is a way we can facilitate the spread of Calicivirus RH5
 Simplify the process for landholders obtaining kangaroo shooting permits
 Targeted landholder workshops for kangaroo & stock grazing management including minimisation of water point access and more targeted roo shooting in conjunction with property management
 Knowledge review: talk to the experts and literature review
 Understand and document reasons for landholders current lack of kangaroo management
 Bring in the experts for grazing management workshops
 Ongoing monitoring and evaluation of the success of herbivore control efforts based on vegetation and soil condition

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8. Appendices

Appendix 1: Simple States and Transitions Model for Restoration of Sheoak Grassy Woodlands

Figure 1a shows the different types of condition “states” encountered on cleared land in linkage areas being targeted for revegetation. State 1 (very rocky areas with remnant understorey) tends to occur on rises where extensive limestone rock projects from the soil surface. These areas are often associated with a diverse assortment of native grassland plants, typically dominated by *Gahnia lanigera*. State 1 thus has the most natural regenerative capacity and should provide the best outcome from revegetation for the least cost. State 2 often occurs in the swales between these very rocky areas and is often encountered within target revegetation areas.

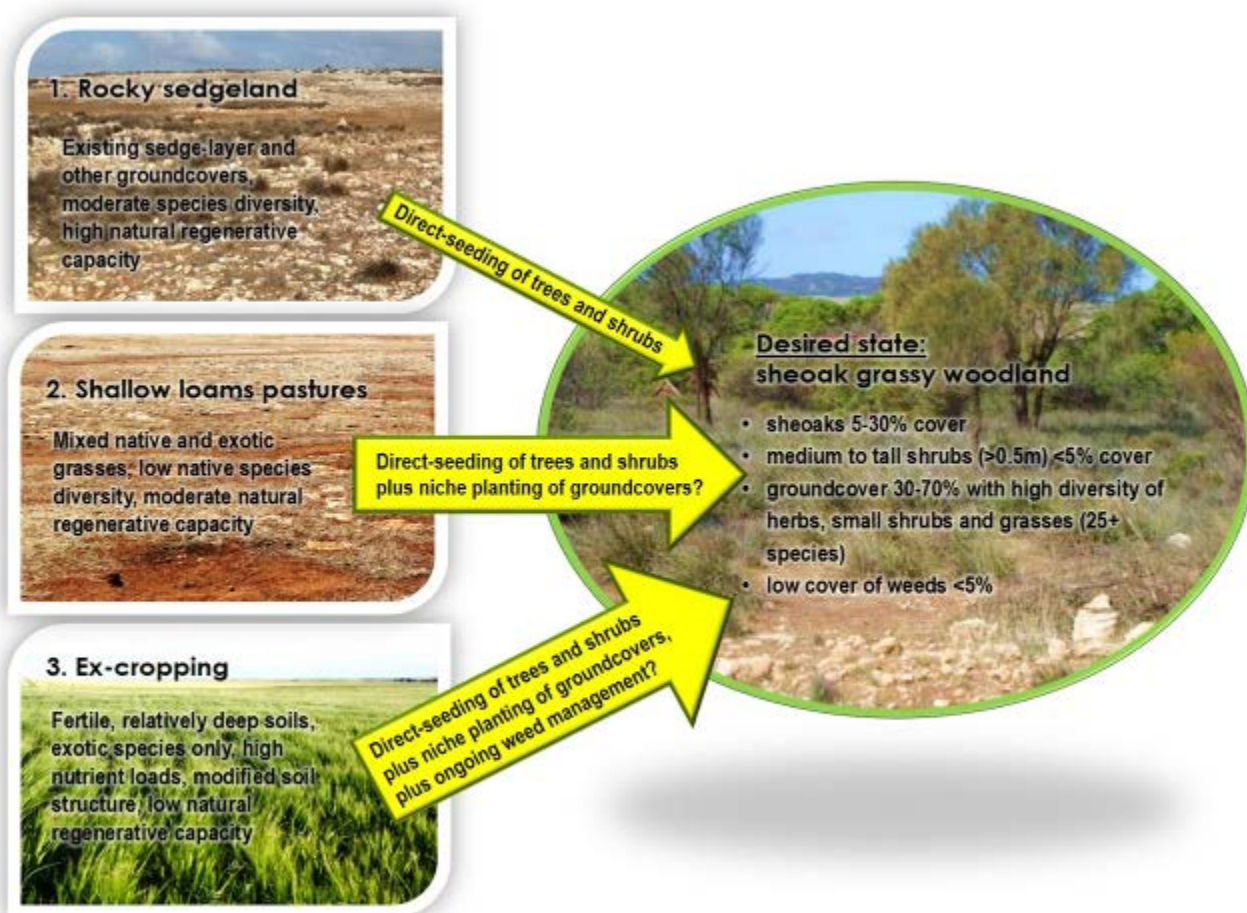
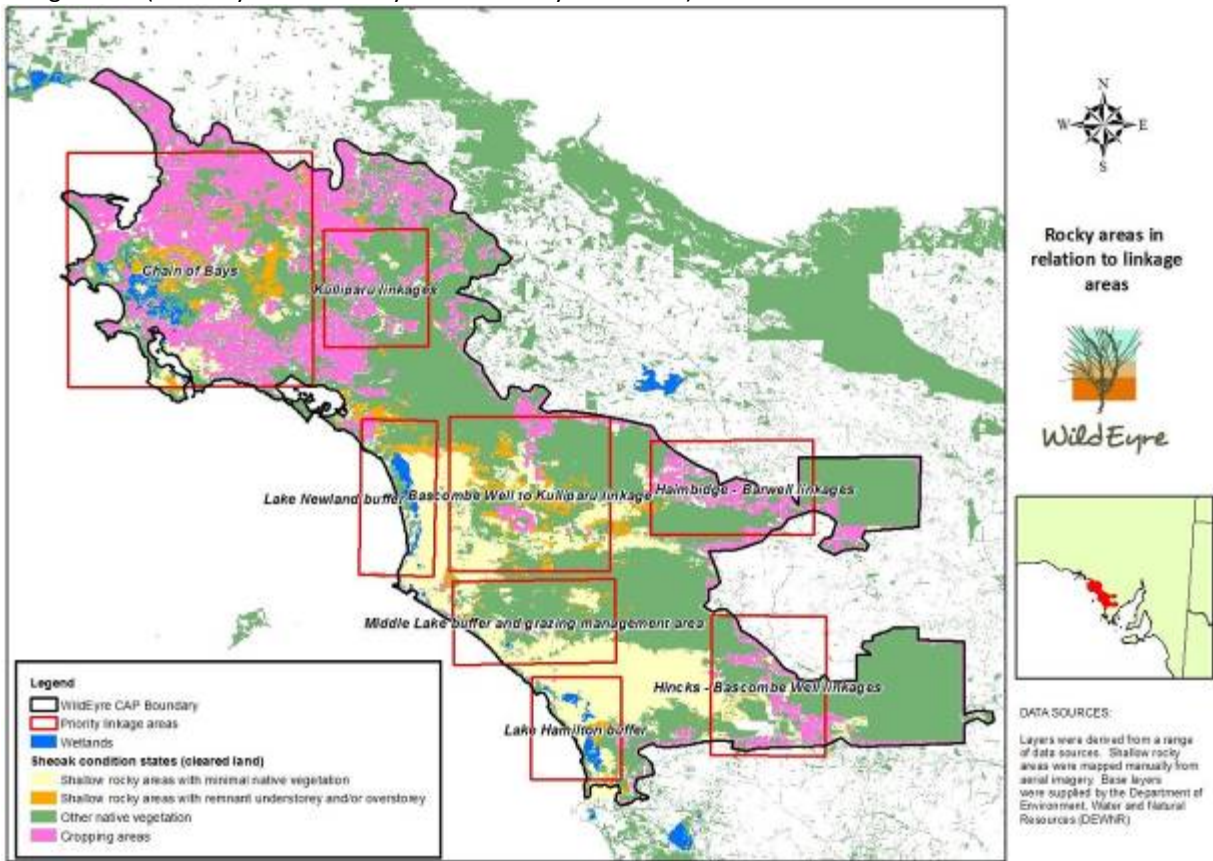


Figure 1a: Different condition “states” encountered on cleared land and theoretical transition (following revegetation) to a Sheoak Grassy Woodland. It is likely that the different condition states would require different revegetation and management inputs to achieve the same result, with state 1 having the most natural regenerative capacity and state 3 the least.

Map 10: Distribution of the three principal condition states on cleared land (described above) targeted for revegetation (formerly dominated by Sheoak Grassy Woodland).



Appendix 2: Knowledge Review of Fire Management in Sand Mallee Communities

Aims:

- Review existing knowledge and shortlist species with particular fire management requirements for the WildEyre region
- Determine any important knowledge gaps with respect to fire ecology in the WildEyre region
- Determine the current Fire Age Class Distribution for different CAP Assets

Methods:

- Reviewed DELWP Central EP Fire Management Plan and summarised findings for WildEyre
- Reviewed relevant scientific literature
- Reviewed action statements for threatened flora and fauna
- Mapped current age class distribution and fire frequency across WildEyre region
- Checked threatened flora database for relevant fire sensitive species

Results:

- management practices that promote **some mid-age (11 to 35 years post-fire)** and **large areas of older vegetation (older than 35 years)** are likely to benefit the greatest number of species in semi-arid mallee ecosystems
- Important structural attributes (such as hollows) continue to develop for at least 100 years after fire, so a long-term view of fire management is required. “Indeed, protection of older vegetation may be essential if future climate changes result in increased fire frequency in mallee shrublands...” Taylor et al. (2012)

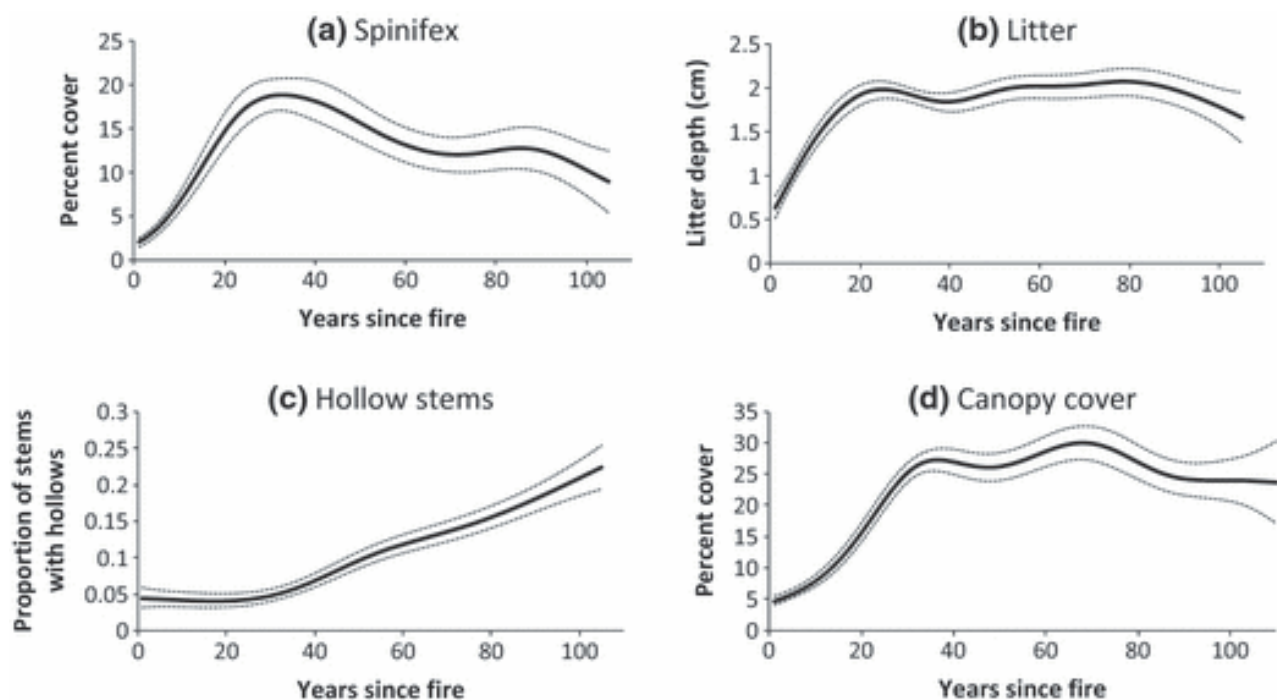
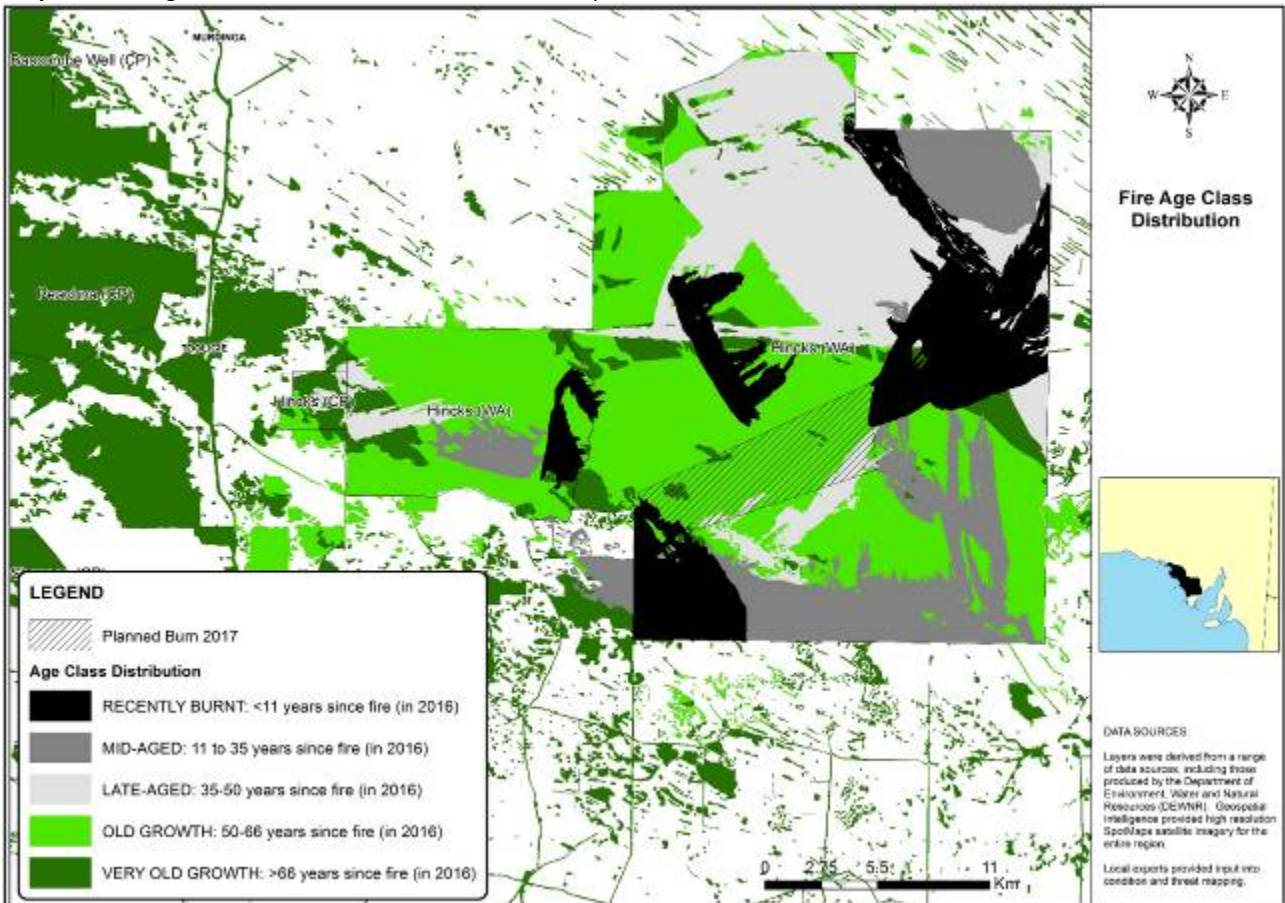


Figure 1. Predicted post-fire changes in several key structural attributes of mallee vegetation across a 105-year time period (Kelly et al. 2012).

Map 16: Fire age class distribution in relation to 2017 planned burn for Hincks Wildlife Area.



Map 17: Fire age class distribution in relation to Sand Mallee communities with spinifex understorey.

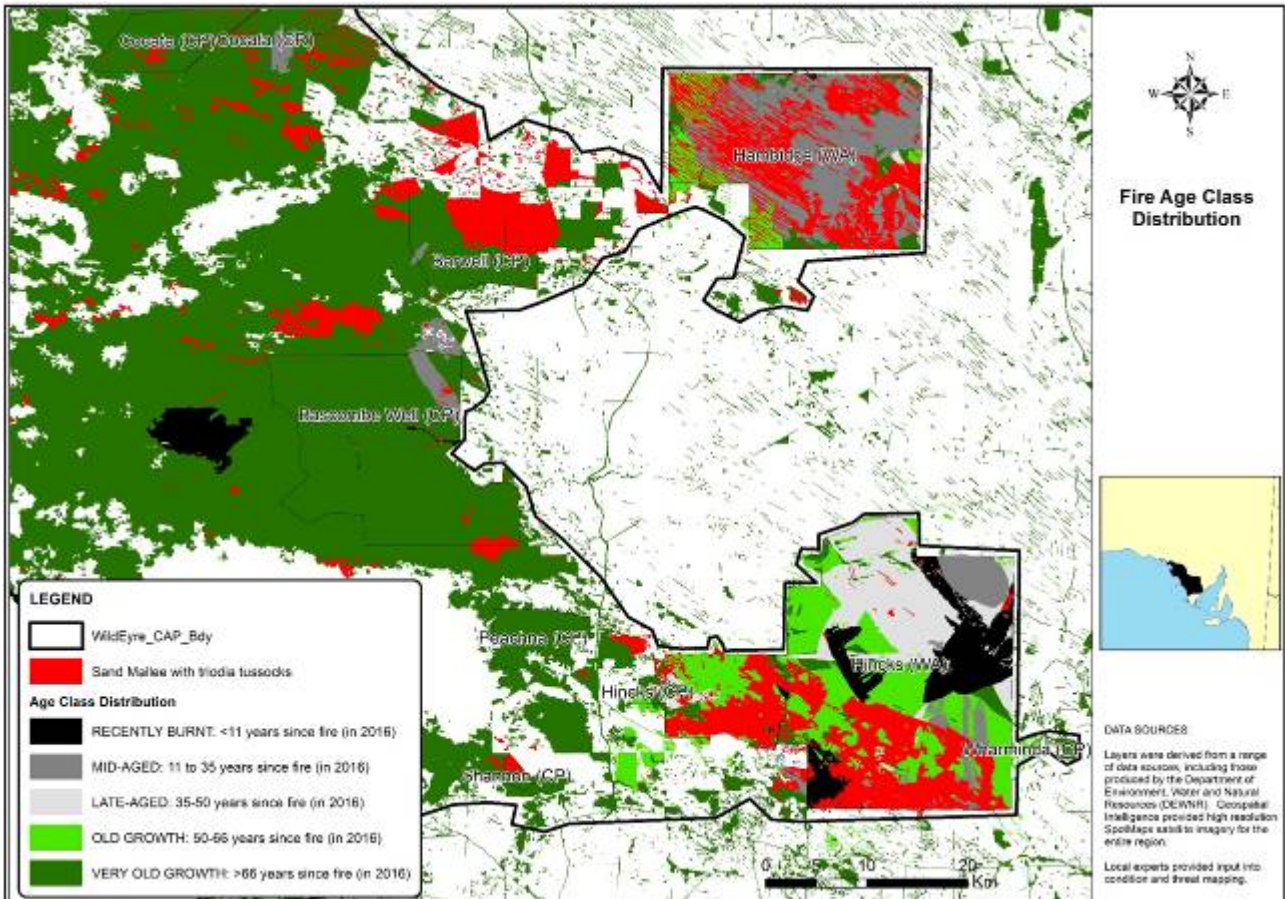


Table 12. Fire-sensitive threatened flora species of the WildEyre region, adapted from DEWNR Central Eyre Peninsula Management Plan.

Species	Common Name	EPBC Status	NPW Status	WildEyre sites	Dependence on fire for germination	Fire management prescription	Regeneration strategy
<i>Acacia enterocarpa</i>	Jumping-jack Wattle	E	E	Hincks	Unknown	Medium fire frequency	Seeding and resprouting?
<i>Acacia rheticarpa</i>	Resin Wattle	V	V	Haimbidge	Likely	Medium fire frequency	Seeding and resprouting?
<i>Caladenia dilatata</i>	Late Spider-orchid		E	Bascombe Well	Unlikely	Unknown	More resprouting
<i>Caladenia tensa</i>	Inland Greencomb Spider-orchid	E		Hincks	Known	Unknown	More seeding
<i>Swainsona pyrophila</i>	Yellow Swainson-pea	V	R	Haimbidge	Likely	Medium fire frequency	
<i>Prasophyllum calcicola</i>	Limestone Leek-orchid		V	Bascombe Well	Likely	Medium (> 20 years)	Seeding

Table 13. Optimal fire regimes for threatened and sensitive fauna species. Key references include Taylor et al. (2012), Kelly et al. (2012), DEWNR (2013) and Moseby et al. (2016).

Species or grouping	EPBC	NPW	Optimal Time since fire	Habitat notes
Malleefowl	VU	V	>35 years old	
Sandhill Dunnart			8 to 20 years (may be a slow decline in habitat quality after 20 years)	
Greater Long-eared Bat	ssp	ssp	>40 years	
Dwarf Four-toed Slider		R	Unknown	
Bardick		R	likely preference for older vegetation	preference for mallee habitats with spinifex
Yellow-throated Miner	ssp	ssp	likely preference for older vegetation	
Chestnut Quail-thrush		ssp	2-15 years (occupies a range of fire age classes but occurs at highest densities in recently burnt)	Ground foraging insects and seeds, sedentary, range of mallee habitats but often spinifex
Purple-gaped Honeyeater		ssp	likely preference for older vegetation	
Gilbert's Whistler		R	likely preference for older vegetation	
Grey Currawong		ssp		
Shy Heathwren		R	Likes well developed shrublayer >35 years since fire	
Birds - general			Older is better (more hollows and habitat diversity)	
Mammals - general			Some species prefer older vegetation but many show no relationship with age since fire	
Reptiles - general			Some species prefer older vegetation but many show no relationship with age since fire	

Sandhill Dunnart (Moseby et al. 2016)

- Best predictor of Sandhill Dunnart **presence** was spinifex **cover** (cover >25%; good for survival)
- Best predictor of Sandhill Dunnart **abundance** was spinifex **height** (height>400mm; good for breeding)
- Spinifex cover peaks at 20-30 years post-fire and starts to decline but spinifex height stays relatively constant
- So Sandhill Dunnart presence more constrained by minimum (>8 years since fire) than maximum (older mallee still provides suitable habitat)
- So habitat suitability should be assessed on the basis of habitat characteristics rather than age-since-fire in isolation
- Avoid burning mid-aged habitat where possible (11-35 years)
- Sandhill Dunnarts may be present in long unburnt areas on private land. These may act as refuges from wildfire.
- Providing dispersal pathways (corridors) as per linkages plan might be important to enable recolonization after fire.

Appendix 3: Prioritisation of Sites for Management of Recreation Access.

Site	Major Biodiversity Values	Biodiversity value of site	Recreational Impacts	Feasibility	Actions required (& comments)	Overall Priority	Funding source	Project Lead
Venus Bay	White-bellied Sea Eagle	NA	NA	NA	Self-managing (inaccessible)	L		
Cape Blanche	White-bellied Sea Eagle	NA	NA	NA	Access management (stones, fencing etc.)	H	TAG	Liz
Elliston	White-bellied Sea Eagle	NA	NA	NA	Self-managing (nesting on Waldegrave Island)	L		
Cape Radstock	White-bellied Sea Eagle	NA	NA	NA	Self-managing (inaccessible, private land with no residence and locked gate)	L		
Pigface Island (tbc)	White-bellied Sea Eagle				Determine location of nest site; determine level of boat and/or car impacts; determine actions required	H	TBD	Mark
Back beach (Corvisart Bay)	Hooded Plover, 1 breeding site, at least two regular breeding pairs south of the board walk, 1 site abandoned due to dogs, one	VH	VH (surf beach, heavy use, high human traffic, lots off dogs off leashes) – both breeding sites	L	Check existing signage (promoting dogs on leashes)	H	TBD	Mark
Hallys Beach (Corvisart Bay)	Hooded Plover, 2 breeding pairs and 2 significant breeding sites	VH	H (pedestrians, dogs; dogs off leashes persist despite signage – largest threat)	L	Existing signage (promoting dogs on leashes). Remove quad bike access point or put new signage at access point and pedestrian dog walking tracks to prevent it becoming a new established track	H	TBD	Mark
Back beach south to High Cliff - includes tractor Beach (Corvisart Bay)	Hooded Plover, 3 breeding pairs closer to Back Beach, 1 breeding pair used to be at Tractor Beach, now gone	VH	M (less pedestrian traffic, backed by private property, dog walkers)	L	No action required, relatively safe area	L		
Fishermans Paradise	Hooded Plover, at least 2 breeding pairs, also breeding pied oystercatchers in dune blowout (in off road vehicle traffic area; camping site and houses)	VH	H (sporadic impacts: pedestrians, dogs, foxes and feral cats noted – doesn't seem to be major issue, increasing pressures from vehicles on beach (but still relatively minor)	H	Needs signage (promoting HP & dogs on leashes) Feral cat control, fox control (lower priority). Use as site to trial Johns cat deodoriser	H	TAG	
Speeds Point	Hooded Plover, 1 breeding pair	H	M (main threat is proximity of camping site to breeding site – 200m)		Adequate signage – 2 lots			
Sceale Bay – (Yanerie to Sceale Bay township)	Hooded Plover, used to be a number of feeding sites at Yanerie, probably 2 breeding pairs between Yanerie Reef and Sceale Bay town, plus at least 6 pairs of breeding Pied Oystercatchers	VH	H	L	Needs signage (promoting HP & dogs on leashes); consider temporary fencing and signage. There is potential to get community support for the project (definitely sceale bay and possibly Yanerie)	H		
Seagull Lake CP	Hooded Plover, shelter, feeding & roosting site in the breeding season; often recorded in May; Coxiella striata snail food source for Hooded Plover; also critical habitat for Bead Samphire, Fairy Tern breeding colonies, Banded Stilt, migratory shorebirds, numerous, EPBC-listing for coastal samphire shrublands, karstic system	H	L	L	Needs signage (promoting shorebirds & dogs on leashes); Fox baiting – needs to be year-round to keep numbers (and include working with neighbours) – currently being ramped up and on track <u>Unregulated water extraction</u> from wells connected to water-extraction from well sites adjacent to Seagull lake for road-making (now complete); impacts on spring water levels – particular issue for breeding Fairy Terns; ongoing issue with water for mining; Use as focal area for lobbying to prevent further water extraction	H (fox baiting program underway and at sufficient scale; water extraction on activities largely complete)		

					May be other impacts from stock water extraction?			
Searcy Bay	Hooded Plover (1 breeding pair, nearby Osprey nest since abandoned), 500-600 Sanderling periodically	M	L	L	Access is through private land, no action required	L		
Baird Bay	Hooded Plover	L (Not a known breeding habitat)	L	L	-	L		
Tyringa Beach	Hooded Plover – 2 regular breeding pairs	H	L	L	No recreation management required Fox management required (landholders responsibility) 1080 and educational signs	H	REG	Mark
Venus Bay: Entrance beach	Hooded Plover, 1 breeding pair, Pied and Sooty Oystercatchers	M (regular nesting pair)	L	VH	Restrict access to a section of Entrance Beach with temporary fencing (also signage)	H	TAG	Liz
Mt Camel beach	Hooded Plover – 1 breeding pair	M	L (fairly inaccessible, one building)	M	No action required	L		
Lake Newland beach north	Hooded Plover	VH	L (access for vehicles difficult due to existing conditions)	H	Need continuation of fox baiting (consider aerial baiting from chopper) Note existing sign at northern end saying dogs are prohibited	H	REG	Mark
Lake Newland beach sth	Hooded Plover breeding, Pied Oystercatchers breeding, up to 900 sanderling, up to 30 Fairy Terns (likely breeding in lakes system)	VH	H (vehicles and dogs); Talia to Walkers Rock – used to be 12 breeding pairs, now 12 birds total (6 breeding pairs max)	M	Difficult to stop vehicles; fox baiting (existing program – Mark Anderson to follow up and check that it is happening); existing signs discussing pied oystercatchers and hooded plovers; Fox baiting needs to be well before August to protect pied oystercatchers and Hooded Plovers	H	REG	Mark
Lake Newland lakes	Hooded Plover (feeding, roosting habitat for fledged juveniles, 6 resident pairs); very high biodiversity values in terms of invertebrates, Fairy Terns (feeding on Hardyhead in southern lakes), 1000's of Banded Stilt; lakes seem to act as a drought refuge for waterfowl in moulting season: Australian Shelduck (1300), Cape Barren Geese (100's), mixed Teal (1000's), Migratory waders	VH	VL (very low access)	H	Fox baiting (existing program – Mark Anderson to follow up and check) Needs investigation into whether Hooded plovers breed on saline lake systems on EP; often seen at springs – possible preference for brackish water	L (not required)		
Lake Newland CR	Hooded Plover, 2 breeding pairs	H	M (fairly inaccessible as most tracks are from private land; walkers, dogs, driving on beach)	M?	Signage required	H	REG	Mark
Elliston town – anxious bay	Hooded Plover, possibly breeding pair – likely breeding on lake and then move across to beach	L-M	H (dogs off leashes, council generally supports dogs off leashes)	L-M	Not feasible to restrict access; signage required)	L		
Sheringa Beach & Sheringa lagoon	Hooded Plover – 1 breeding pair, Sheringa lagoon – breeding Blue-billed Duck, breeding Great Crested Grebe, breeding Musk Duck, Fairy Terns – feeding, Australian Shelduck (100's)	H	H	M (difficult to restrict access)	Review signage – make stronger and more targeted fencing	M	TAG	Liz
Point Gibson	Migratory shorebirds (>2000 shorebirds; 23 species, 18-19 of which are migratory), nesting Pied Oystercatchers (more than 102 – part of internationally significant site for pied oystercatchers)	VH	H	H	Vehicle access management and signage required. Repair the fence to restrict access to northern beach (at the bushes or east of the bushes) and install signage Access should be restricted to the greatest extent possible. Lobby government to consider purchase of private land	H	TBD	Mark