

Conservation Action Planning

June 2015 Summary



Southern Yorke Peninsula ("Naturally Yorke")

A Collaborative, Landscape-scale Planning Approach to
Biodiversity Conservation on the Southern Yorke Peninsula,
South Australia.

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Abbreviations

CAP	Conservation Action Planning
CP	Conservation Park
DEWNR	Department for Environment, Water and Natural Resources
IBRA	Interim Biogeographic Regionalisation of Australia
INFFER	Investment Framework for Environmental Resources
LAF	Landscape Assessment Framework
NP	National Park
NRM	Natural Resources Management
NY NRM	Northern and Yorke Natural Resources Management Board
Aus	Australia
SA	South Australia
CD	Conservation Dependent
CE	Critically Endangered
E	Endangered
V	Vulnerable
R	Rare

1. Background

1.1. Introduction

This document summarises the progress of the **Southern Yorke Peninsula Conservation Action Planning (CAP) process** to the 30th June 2015. The process commenced in late 2010 and the planning team (refer Appendix 4) has met quarterly to develop a biodiversity conservation plan for the region. The 1st Iteration CAP was summarised in June 2011 and has been updated annually. This document contains refinements made during 2014/2015.

Achievements of the CAP process in 2014/2015 include:

- CAP workshop #12, 14th-15th October focussing on developing the Small Mammals information and strategies
- CAP workshop #13, 9th – 10st February focussing on updating CAP viability ratings and auditing the project as a whole.
- Provisional Agreement on a Project Name (“Naturally Yorke: wild, rugged, prosperous”)
- Updated Threat and Viability Ratings
- Draft Prospectus for Mammal Reintroductions Project
- On-ground delivery of the south-west Biofund project

A number of resources have been updated and several new related reports have been produced in 2014/2015. The list of available resources is presented in Appendix 6.

1.1.1. Conservation Action Planning (CAP)

The planning process for the Southern Yorke Peninsula uses the Conservation Action Planning (CAP) framework developed by the US-based conservation group The Nature Conservancy www.nature.org as its basis. This framework is widely used in the development of international conservation projects and is becoming more widely adopted in Australia 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 Excel-based software, or Miradi program, 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 sets 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 conservation practitioners and therefore incorporates local practitioner input into the planning process.

The major steps in the process, as outlined in this document, 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, 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 strategies, action steps and key programs to achieve the conservation objectives;
- the development of a monitoring and evaluation program and adaptive management framework.

1. Background

1.2 Regional Planning Context

1.2.1 Northern and Yorke Natural Resources Management (NRM) Board Region

The NRM region extends from the northern Adelaide plains in the south to the Southern Flinders Ranges in the north and includes the whole of the Yorke Peninsula. In total, the Northern and Yorke NRM region covers over 3 million hectares and supports a population of approximately 95,000 people (Northern and Yorke NRM Board 2009).

For conservation action planning purposes, the region has been divided into three sub-regions based primarily on ecological characteristics (refer Map 1). The three sub-regions are:

- Southern Flinders Ranges (Living Flinders Project Area)
- Mid North Agricultural Districts
- Southern Yorke Peninsula

1.2.2 Biodiversity Conservation Organisations, Programs and Legislation

The Southern Yorke Peninsula CAP is a sub-regional planning process which complements existing regional plans and strategies (refer Appendix 3 for N&Y NRM regional goals). It also contributes to national and state biodiversity conservation programs and funding priorities (refer Table 1 below).

The principal organisations involved in biodiversity conservation on the Southern Yorke Peninsula are the Northern and Yorke Natural Resources Management Board and the State Government Department for Environment, Water and Natural Resources. These organisations underwent a merger in 2010/2011 and now function primarily as one organisation (Department for Environment, Water and Natural Resources).

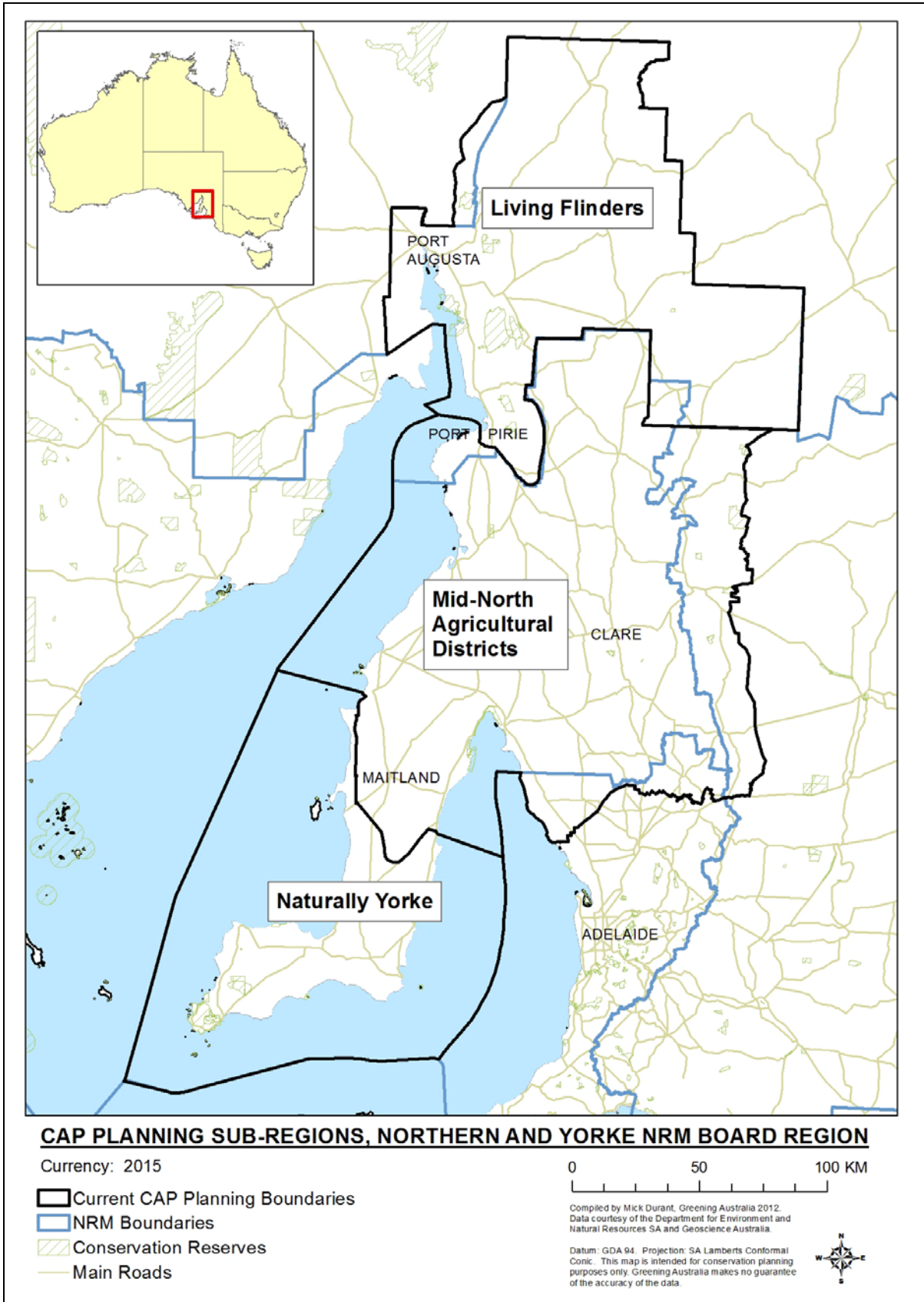
Other contributors to biodiversity conservation in the region include the District Council of Yorke Peninsula and a number of non-government organisations including the Nature Conservation Society of South Australia, Greening Australia, Trees for Life, Threatened Plant Action Group, Ag Excellence Alliance and Native Orchid Society of South Australia. Active community groups include the West of Peesey Group, Southern Yorke Peninsula Landcare Group, Foul Bay Area Progress Association and South Coast Road Environmental Group. Aboriginal Lands on central-western Yorke Peninsula, including Wardang Island, are also involved in natural resources management activities primarily through the Narungga community at Point Pearce. Refer Appendix 5 for current biodiversity conservation projects in the region.

Table 1: Existing Biodiversity Programs, Strategies and Legislation

National	State (SA)	Regional (N&Y 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"> • Northern and Yorke NRM Plan • Northern and Yorke Biodiversity Plan • DENR Biodiversity Strategy • Threatened Species Recovery Plans 	<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) • Coast Protection Act 1972

1. Background

Map 1: CAP Sub-Regions of the Northern and Yorke NRM Board Region



1. Background

1.3 The Southern Yorke Peninsula Project Area

The Southern Yorke Peninsula project area covers approximately 360,000 hectares from Innes National Park on the south-western tip of the peninsula to near Curramulka on central Yorke Peninsula (refer to Map 2). The boundary also extends to the Point Pearce community and Aboriginal Lands near Port Victoria in the north-west, and up the coast from Point Pearce to Cape Elizabeth.

1.3.2 Regional Landforms

Regional landforms include semi-saline wetland systems in low-lying areas near Warooka and Yorketown, high-energy rugged coastlines in the south-west, low-energy cliffs and dunes on the east and upper west coast and undulating to low hilly plains throughout inland areas. No part of the project area is more than 20km from the coast.

1.3.3 Climate and Rainfall

The area is subject to typical Mediterranean climatic conditions with mild wet winters and hot dry summers. Rainfall is highest on the SW foot with (mean annual rainfall of 434 mm at Stenhouse Bay) and on the higher elevations of the leg. Edithburgh receives a mean annual rainfall of 359mm and Warooka 446 mm (BOM 2011).

1.3.4 The Narungga People

The project area is the traditional country of the Narungga people. The following is an excerpt from a poster located at Point Pearce:

'The Narungga country once extended as far north as Port Broughton and east to the Hummock Ranges. Their neighbours were the Kurna of the Adelaide Plains and the Nukunu to the north, with whom the Narungga would meet for trade and ceremony. The Narungga nation was made up of four clans, the Kurnara in the north of the peninsula, Winderera in the east, Wari in the west and Dilpa in the south.'

The Narungga managed and preserved their lands. They used fire to clear old grasses and promote fresh plant growth. Fresh water rockholes were covered with slabs of stone or brushwood to keep the water clean and to prevent animals from drinking from them. Trackways were maintained through thick mallee forests, linking places and people throughout the peninsula.'

For further reading D.L. & S.J Hill (1975) have collated an excellent history of the tribes based on what little was documented, and they describe many locations of particular significance for Narungga people.

1.3.5 European Land Use History

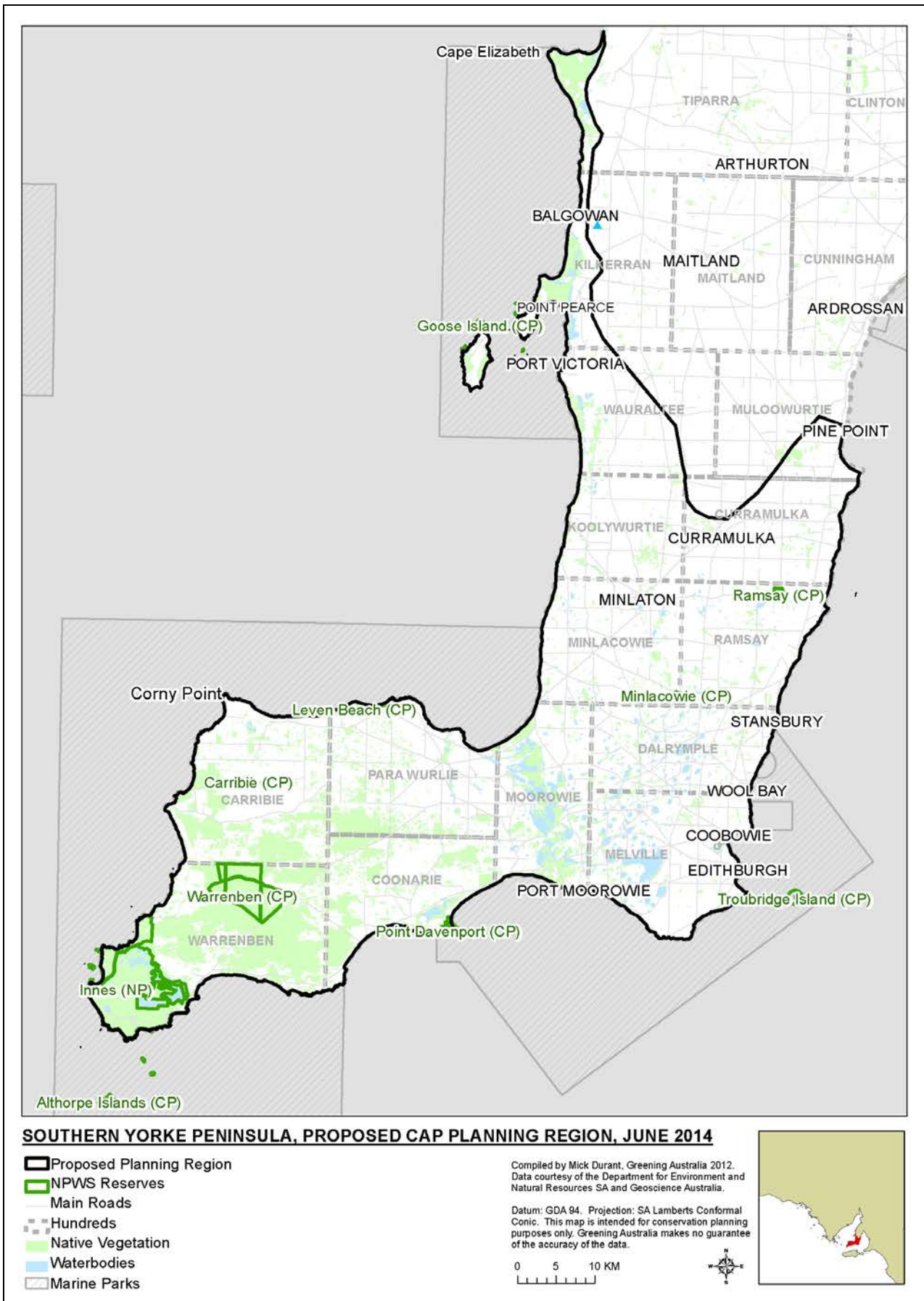
Livestock grazing (predominantly sheep) began in the mid-nineteenth century near the township of Stansbury. The first formal pastoral leases occurred in 1851 and by 1865 extended over virtually the entire 'foot' of the peninsula and up the western side of the 'leg.' As with most agricultural regions the rate of land clearance increased dramatically after 1927 with advances in agriculture relating to an improved understanding of trace elements and the development of fertilisers (DEH 2003). Mining of gypsum began at Marion Bay in 1889 and at Stenhouse Bay from 1913, continuing until around 1973 (DEH 2003). Other mining activities included sand mining on Wardang Island, guano mining in the caves on Althorpe Island and the burning of lime at Stansbury.

1.3.6 Native Vegetation

The south-west of the peninsula contains extensive areas of sub-coastal mallee dominated by Coastal White Mallee (*Eucalyptus diversifolia* +/- *Eucalyptus rugosa*) interspersed with woodland formations of Mallee Box (*Eucalyptus porosa*), Drooping Sheoak (*Allocasuarina verticillata*) and Dryland Tea-tree (*Melaleuca lanceolata*). Native vegetation

1. Background

Map 2: Southern Yorke Peninsula CAP Project Boundary



1. Background

cover is relatively high in the south-west with the Innes IBRA Association boundary retaining approximately 52% native vegetation cover.

Typical plant communities found along the high energy coasts are low shrublands on exposed rocky cliffs dominated by Pale Turpentine Bush (*Beyeria lechenaultii*), Coast Velvet-bush (*Lasiopetalum discolor*), Cushion Bush (*Leucophyta brownii*) and Cushion Fan-flower (*Scaevola crassifolia*), and coastal dune shrublands dominated by Coast Daisy-bush (*Olearia axillaris*), Coastal Beard-heath (*Leucopogon parviflorus*), Wattle species (*Acacia spp*) and Common Boobialla (*Myoporum insulare*). Rear dunes generally support open woodlands dominated by Drooping Sheoak (*Allocasuarina verticillata*) and Dryland Tea-tree (*Melaleuca lanceolata*) over coastal shrubs.

Inland wetlands and saline lakes are dominated by samphire shrublands or Swamp Paperbark forests (*Melaleuca halmaturorum*), occasionally with Cutting Grass (*Gahnia filum*) sedgelands. Native vegetation cover is largely absent from the wetland systems to the east and north of the Peesey system (the Yorketown Lakes).

The 'leg' of the peninsula contains highly fragmented vegetation remnants including Mallee Box (*Eucalyptus porosa*), Drooping Sheoak (*Allocasuarina verticillata*) and Dryland Tea-tree (*Melaleuca lanceolata*) woodlands. Fragmented mallee associations include Ridge-fruit Mallee (*Eucalyptus incrassata*) with a shrubby understorey on deep sands, and mixed mallee associations on loams and shallow limestone soils. The 'leg' of the peninsula within the Southern Yorke IBRA Sub-region retains only 18% native vegetation cover.

Threatened Plant Species

Spatial database records managed by DEWNR show 75 plant species of national or state conservation significance within the project area (refer Appendix 1). Fourteen species are listed as nationally rare, vulnerable or endangered.

A regional species risk assessment (Gillam & Urban 2008) recorded 659 native vascular plant species within the Southern Yorke IBRA subregion with **21 species (3%) Critically Endangered, 43 species (6%) Endangered, 62 species (9%) Vulnerable and 141 species (21%) considered Rare**. Approximately 10% of these species were assessed to be definitely decreasing in abundance and / or distribution and 31% as probably decreasing.

Species of note include a number of threatened orchids (eg. *Caladenia brumalis*, *C. macroclavia*, *C. conferta*, *C. intuta*, *Prasophyllum goldsackii*), two nationally threatened wattle species (*Acacia rhetinocarpa*, *A. enterocarpa*), Silver Daisy-bush (*Olearia pannosa ssp pannosa*), Annual Candles (*Stackhousia annua*) and a number of swamp-associated species including Bead Samphire (*Tecticornia flabelliformis*) and Silver Candles (*Pleuropappus phyllocalymmeus*).

1.3.7 Fauna

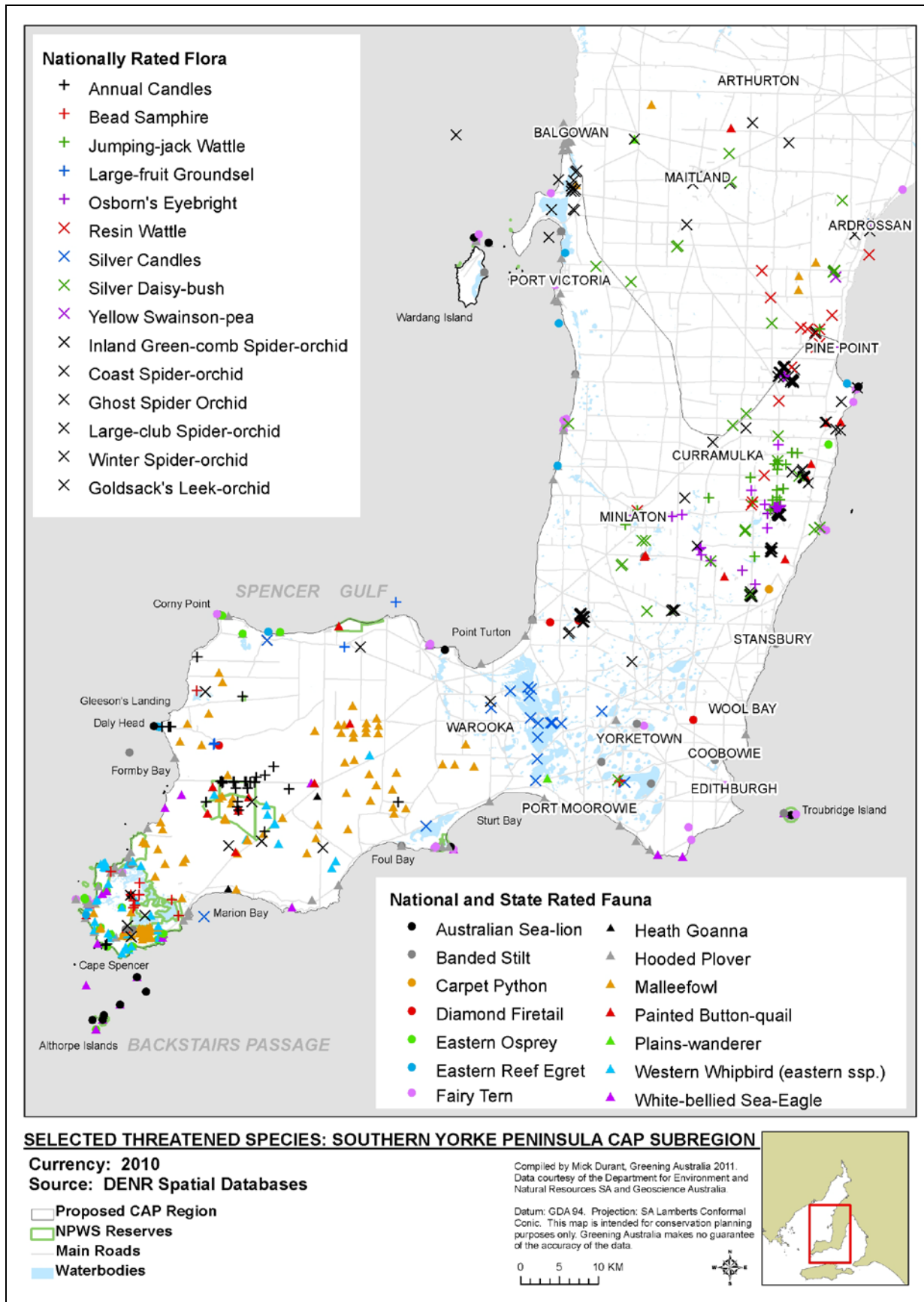
The south-western tip of the Yorke Peninsula is a refuge area for many mammal, bird and reptile species which are declining or have disappeared from elsewhere in southern South Australia. However, as in other parts of the state there has been a dramatic decline in terrestrial mammal species. In an analysis of sub-fossil material, Graham Medlin (2011) identified that of the 24 species of mammal that have inhabited the peninsula in recent times, at least 18 species have become extinct. The main causes of the decline include habitat clearance and the introduction of foxes, cats and rabbits.

Remaining terrestrial mammal species include the Western Grey Kangaroo (*Macropus c.f. fuliginosus*), Brushtail Possum (*Trichosaurus vulpecula*), Western Pygmy Possum (*Cercartetus concinnus*), Southern Hairy-nosed Wombat (*Lasiorhinus latifrons*), Fat-tailed Dunnart (*Sminthopsis crassicaudata* - status uncertain) and Short-beaked Echidna (*Tachyglossus aculeatus* - status uncertain). Australian Sea-lion (*Neophoca cinerea*) colonies can also be found on the coast. Other notable fauna species include the re-introduced Tammar Wallaby (*Macropus eugenii*) within Innes National Park and on Wardang island, and the Rosenbergs and Sand Goannas (*Varanus rosenbergi*, *V.gouldii*).

Notable bird species include the nationally threatened Mallee Fowl (*Leipoa ocellata*), Plains-wanderer (*Pedionomus torquatus*), eastern subspecies of the Western Whipbird (*Psophodes nigrogularis ssp. leucogaster*) and a large range of coastal birds including the White-bellied Sea-eagle (*Haliaeetus leucogaster*), many migratory waders and Little Penguin (*Eudiptula minor*) colonies on Wardang Island.

1. Background

Map 3: Selected Threatened Species Records: Southern Yorke Peninsula CAP region



1. Background

Threatened Fauna

Spatial database records managed by DEWNR show 14 mammal, bird and reptile species of national or state conservation significance within the project area (refer Appendix 2). Four species are listed as nationally threatened including the Malleefowl, eastern subspecies of the Western Whipbird, Australian Sea-lion and Plains Wanderer.

Gillam & Urban (2008) recorded 258 species (including marine mammals and freshwater fish) in the Southern Yorke IBRA subregion with **7 species (3%) Critically Endangered, 24 species (9%) Endangered, 28 species (11%) Vulnerable and 68 species (26%) considered Rare**. Approximately 8% of these species were assessed to be definitely decreasing in abundance and/or distribution and 35% as probably decreasing.

1.4 Social Context

1.4.1 Population

The project area encompasses the main population centres of Minlaton, Stansbury, Edithburgh, Yorketown and Warooka and a number of smaller settlements such as Marion Bay, Corny Point and Coobowie. Minlaton is the largest town in terms of population with 774 people registered in the 2006 census, followed by Yorketown with 685 and Stansbury with 522.

The total resident population of the project area is difficult to determine however it can be estimated to be between 7,000 and 8,000 people based on the Bureau of Statistics 2006 census data. The Yorke Peninsula Local Government Area which extends to the top of Yorke Peninsula recorded a population of 11,190 people in 2006 with 1009 people identifying sheep, beef cattle and / or grain farming as their main occupation (24.4% of the workforce).

Southern Yorke Peninsula also supports a substantial non-resident population including absentee landholders (eg. holiday house owners) and tourists. The tourism industry is based on coastal recreation activities such as fishing, camping, boating and surfing.

Table 2: Selected Demographic Statistics from the 2006 Census

Location	Population	Labour Force	Labour Force involved in Farming Activities	% Involved in Farming Activities
Yorke Peninsula (LGA)	11,190	4,363	1009	24.4%
Minlaton (State Suburb)	774	290	22	7.9%
Stansbury (State Suburb)	522	153	10	6.8%
Edithburgh (State Suburb)	512	182	19	11.7%
Warooka (State Suburb)	247	102	20	22%
Yorketown (Urban Locality)	685	300	30	10%

1.4.2 Landholdings

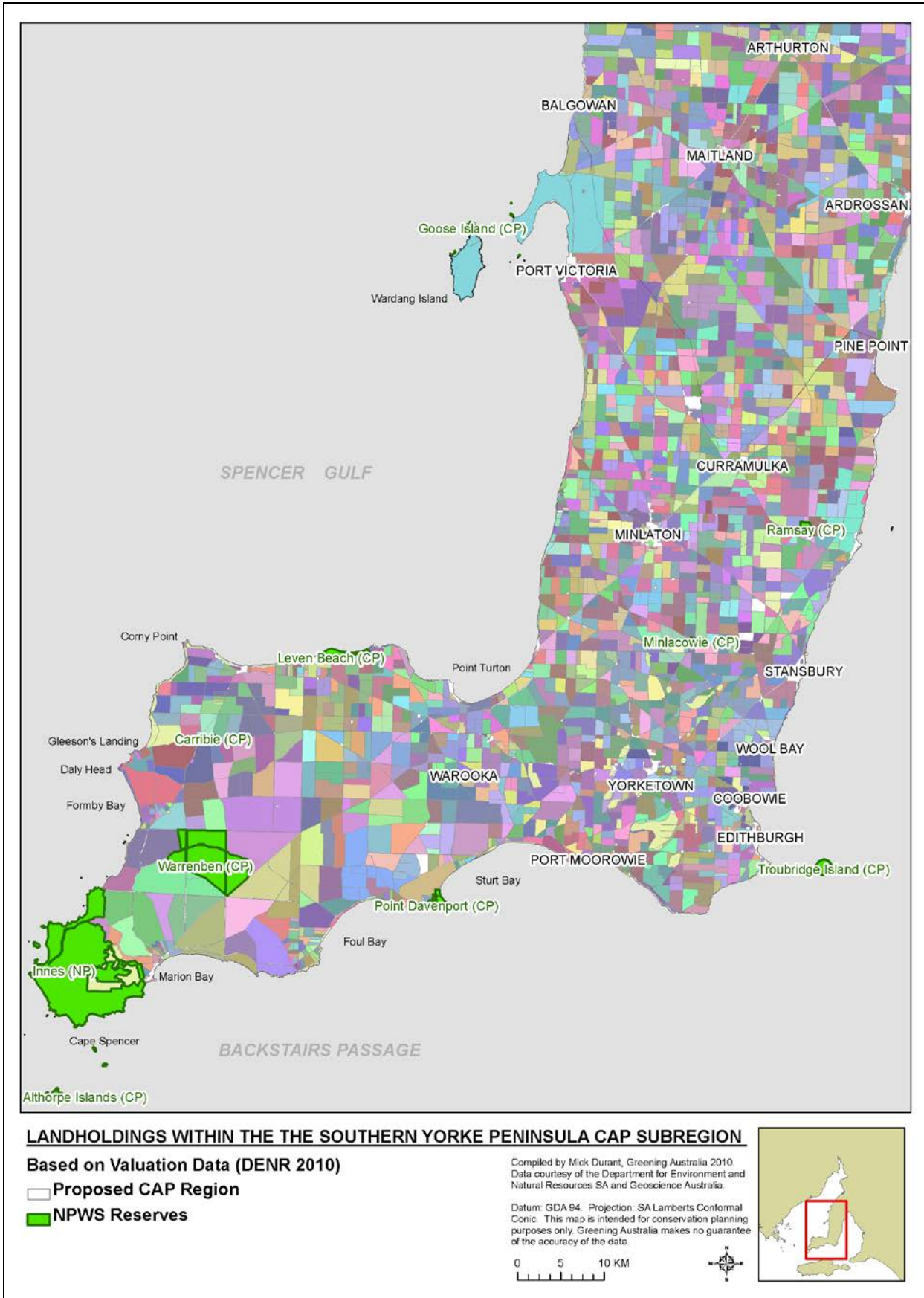
Rural landholdings are generally of moderate or small size with few farms exceeding 5,000 hectares. There is increasing subdivision with lifestyle blocks becoming common on the 'foot' of the peninsula, many of which are owned by absentee landholders from towns to the north or from Adelaide. Map 4 gives an indication of relative property sizes.

Key landholders in the region include the Minister for Environment and Conservation (Department for Environment, Water and Natural Resources), District Council of Yorke Peninsula, Aboriginal Lands Trust (ALT) and Narangga Nation Aboriginal Corporation (Point Pearce). There are few large corporate landholders although mining operations are increasing in the region.

For further information, a recent survey and report by the University of South Australia (Raymond & Weber 2014) gives a good overview of landholder attitudes to farming, environment and carbon sequestration on SYP (see Appendix 6).

1. Background

Map 4: Property Ownership on Southern Yorke Peninsula



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2. Identification of Conservation Assets

2.1. Method for Identifying Conservation Assets

The first step in the conservation action planning process involves the identification of a small number of focal conservation assets (i.e. ecosystems, communities or species) that collectively represent the biodiversity of a region. The explicit 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 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:

- rare, threatened and endemic species;
- species with highly disjunct (spatially separate) populations or restricted distributions;
- keystone or highly interactive species (those that have a disproportionate influence on the structure and ecological function of the community);
- wide-ranging species.

Species and communities that fall into the above categories may be captured by threatened species recovery programs or may need to be considered as separate conservation assets.

Source: Adapted from Low (2003)

2.2. Conservation Assets of the Southern Yorke Peninsula

Ten key conservation assets have been identified by the Southern Yorke Peninsula planning team. Each conservation asset is associated with numerous nested assets (i.e. individual communities, species assemblages and threatened species) which are likely to be an important focus of conservation efforts and help further define the asset. The key conservation assets and associated nested assets are described in more detail in the following section. The spatial distribution of the assets is presented in Map 5 and Map 3 shows the distribution of associated threatened species.

1. High Energy Coastal Dunes and Sandy Beaches
2. High Energy Coastal Cliffs and Rocky Shorelines
3. Low Energy Sheltered Coastlines
4. Inland Wetlands
5. Sub-coastal Mallee Communities
6. Relictual Mallee Communities
7. Open Woodlands
8. Offshore Islands
9. Southern Hairy-nosed Wombat
10. Small Mammals

2. Identification of Conservation Assets

2.2.1 High Energy Coastal Dunes and Sandy Beaches

High energy coastal dunes and sandy beaches occur on the south-western tip of the peninsula where the coast is exposed to the open waters of the Southern Ocean. Important areas include the tall dune systems around Formby Bay and the beach and dune systems within Innes National Park and Marion Bay. Notable fauna include threatened shorebirds and seabirds such as the state vulnerable Hooded Plover (*Thinornis rubricollis*) and state endangered Fairy Tern (*Sternula nereis*).



Nested Assets		AUS	SA
PLANT COMMUNITIES	Coastal Dune Shrublands (e.g. <i>Olearia axillaris</i> , <i>Leucopogon parviflorus</i>)		
PLANT COMMUNITIES	Drooping Sheoak (<i>Allocasuarina verticillata</i>) Woodlands on rear dunes		
MAMMAL ASSEMBLAGE	Western Grey Kangaroos, Echidnas		
MARINE MAMMALS	NZ Fur-seals (<i>Arctocephalus forsteri</i>) – haul out area Australian Sea Lion (<i>Neophoca cinerea</i>) – haul out area	VU	V
BIRD ASSEMBLAGE	Shorebirds – e.g. Hooded Plover, Red-capped Plovers, Sanderling, Seabirds – e.g. Penguins, Terns, Woodland birds – e.g. Golden Whistler, Wrens		
REPTILE ASSEMBLAGE	Death Adder, Sand Goanna, Rosenberg Goannas, Skinks, Geckos		
THREATENED BIRDS	Hooded Plover (<i>Thinornis rubricollis</i>) Fairy Tern (<i>Sternula nereis</i>) White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>)- feeding area Osprey (<i>Pandion cristatus</i>) -feeding area Peregrine Falcon (<i>Falco peregrinus</i>) Rock Parrot (<i>Neophema petrophila</i>)		V E E E R R
KEY LOCATIONS	Innes NP, Browns Beach, Marion / Formby Bay, Pandalowie, Pt Davenport - Pt Moorowie		

2.2.2 High Energy Coastal Cliffs and Rocky Shorelines

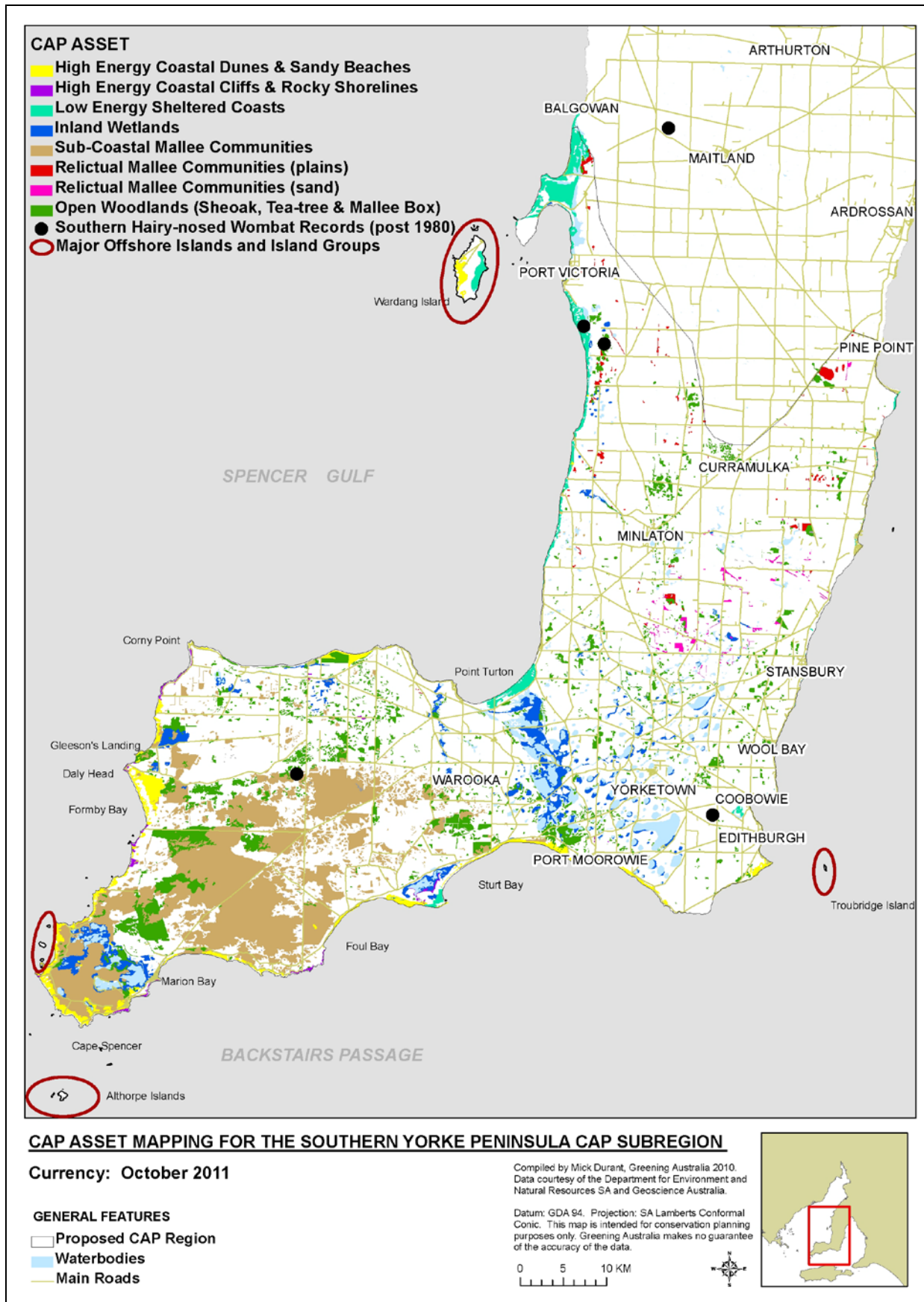
High energy coastal cliffs occur on the south-western tip of the peninsula. This asset is characterised by low coastal shrublands on top of medium-height cliffs with a rocky intertidal zone at the base. Notable fauna include the White-bellied Sea-eagle (*Haliaeetus leucogaster*) and Osprey (*Pandion cristatus*) which nest along the cliffs, marine mammals such as the Australian Sea-lion (*Neophoca cinerea*) and a range of migratory shorebirds. Important locations include Corny Point, Innes National Park and Foul Bay.



Nested Assets		AUS	SA
PLANT COMMUNITIES	Coastal Cliff Shrublands (e.g. <i>Lasiopetalum discolor</i> , <i>Leucophyta browni</i>)		
KEY HABITAT AREAS	Inter-tidal rocky areas, cliffs, outcrops, cavities & caves (roosting & nesting)		
MAMMAL ASSEMBLAGE	Bats		
MARINE MAMMALS	NZ Fur-seals (<i>Arctocephalus forsteri</i>) – haul out area Australian Sea Lion (<i>Neophoca cinerea</i>) – haul out area	VU	V
BIRD ASSEMBLAGE	Shorebirds – e.g. Ruddy Turnstone, Sooty Oystercatchers		
REPTILE ASSEMBLAGE	Sand Goannas, Rosenberg Goannas, Tiger Snakes		
THREATENED BIRDS	White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>) Osprey (<i>Pandion cristatus</i>) Peregrine Falcon (<i>Falco peregrinus</i>)		E E R
INVERTEBRATES	Marine invertebrates on rocky inter-tidal areas		
KEY LOCATIONS	Innes National Park, Corny Point, Pt Yorke, Gleasons Landing, Cape Eliza		

2. Identification of Conservation Assets

Map 5: Conservation Assets of the Southern Yorke Peninsula CAP region



2. Identification of Conservation Assets

2.2.3 Low Energy Sheltered Coastlines

Low energy sheltered coastlines are characterised by low sand dune complexes, beach and tidal flats, sand spits and sheltered bays and inlets. Important locations include the coastal inlets of Point Davenport and Coobowie and the low cliffs and dunes on the eastern and western side of the 'leg' of the peninsula. Important habitat is provided for migratory shorebirds on tidal flats and for small raptors on low cliffs.



Nested Assets		AUS	SA
PLANT COMMUNITIES	Coastal Dune Shrublands (e.g. <i>Olearia axillaris</i> , <i>Leucopogon parviflorus</i>) Temperate Coastal Saltmarsh Communities	V	
KEY HABITAT AREAS	Sand spits, sand and mud flats, low cliffs, inter-tidal Samphire, sheltered bays and inlets, fish breeding areas		
BIRD ASSEMBLAGE	Shorebirds – e.g. Pied Oystercatchers, Eastern Reef Egret, Little Penguin, Other Migratory Shorebirds, Waterbirds – e.g. Pelicans, Black Swans, Cormorants, Teal Ducks, Raptors - Peregrine Falcons		
REPTILE ASSEMBLAGE	Whip Snakes		
INVERTEBRATES	Razorfish, Crabs, Oysters, etc		
THREATENED BIRDS	Hooded Plover (<i>Thinornis rubricollis</i>)		V
KEY LOCATIONS	Pt Davenport, Hardwicke Bay, Coobowie, Stansbury - Port Vincent, leg of Yorke Peninsula		

2.2.4 Inland Wetlands

Inland wetlands occur as shallow semi-saline systems separated from the coast. Fresher wetlands also occur at Gum Flat near Minlaton and 'The Drain' between Warooka and Corny Point. Other important locations include the saline lake systems within Innes National Park, the Peesey Swamps and the crater-like lakes east of Yorketown. Where vegetated, these areas generally support Swamp Paperbark (*Melaleuca halmaturorum*) forests, Thatching Grass (*Gahnia filum*) sedgelands and low samphire shrublands. Threatened plant species include the nationally vulnerable Bead Samphire (*Tecticornia flabelliformis*) and Silver Candles (*Pleuropappus phyllocalymmeus*).



Nested Assets		AUS	SA
PLANT COMMUNITIES	Salt Paperbark (<i>Melaleuca halmaturorum</i>) Forests		
PLANT COMMUNITIES	Thatching Grass (<i>Gahnia filum</i>) Sedgelands		V
PLANT COMMUNITIES	Samphire Low Shrublands		
PLANT COMMUNITIES	Red Gum (<i>Eucalyptus camaldulensis</i>) Woodlands at Gum Flat		
BIRD ASSEMBLAGE	Shorebirds – e.g. Stints, Avocets, Dotterels, Sharp-tailed Sandpiper, Curlew Sandpiper, White-fronted Chats, Wood Sandpiper, Banded Stilt, Waterbirds – e.g. Ducks, Cape Barren Geese		
INVERTEBRATES	Yellowish Sedge-skipper butterfly (in Thatching Grass), Brine Shrimp		
THREATENED PLANTS	Bead Samphire (<i>Tecticornia flabelliformis</i>) Silver Candles (<i>Pleuropappus phyllocalymmeus</i>) Salt Isotome (<i>Isotoma scapigera</i>)	VU VU	V V R
OTHER ATTRIBUTES	Stromatolites (in Innes National Park), Freshwater soaks		
KEY LOCATIONS	Peesey Swamps, The Drain, Innes N.P., Gum Flat, Lake Fowler, Yorketown, Thidna CP, Pt Davenport, Corny Point freshwater soaks		

2. Identification of Conservation Assets

2.2.5 Sub-coastal Mallee Communities

Sub-coastal mallee (*Eucalyptus diversifolia* &/or *E. rugosa*) is the dominant vegetation type on the south-west of the peninsula. It occurs on soils which are unsuitable for agriculture and therefore has not been extensively cleared. The vegetation is low and dense and supports a range of notable fauna including the Western Pygmy Possum, Mallee Fowl and Western Whipbird. This conservation asset is well protected within the formal reserve system including Innes National Park, Warrenben Conservation Park and adjacent Heritage Agreements.



Nested Assets		AUS	SA
PLANT COMMUNITIES	Coastal Mallee (<i>Eucalyptus diversifolia</i> , <i>E. rugosa</i>)		
MAMMAL ASSEMBLAGE	Western Pygmy Possum, Tammar Wallaby (reintroduced), Western Grey Kangaroo, Bats, Echidnas		
BIRD ASSEMBLAGE	Declining Woodland Birds – e.g. Scrub Robin, Golden Whistler, Bronzewing, Purple-gaped Honeyeater, Scarlet Robin, Shy Heath-wren, Spotted Pardalote, Painted Button-quail, Spotted Nightjar		
REPTILE ASSEMBLAGE	Heath Goanna (<i>Varanus rosenbergi</i>)		V
THREATENED BIRDS	Mallee Fowl (<i>Leipoa ocellata</i>) Western Whipbird (<i>Psophodes nigrogularis leucogaster</i>) Bush Stone Curlew (<i>Burhinus grallarius</i>)	VU VU	V E R
THREATENED PLANTS	Orchids (e.g. <i>Caladenia brumalis</i> , <i>Prasophyllum goldsackii</i>)	E/V	E/V
KEY LOCATIONS	Innes National Park, Warrenben Conservation Park, Heritage Agreements		

2.2.6 Relictual Mallee Communities

Relictual mallee communities occur on the 'leg' of the peninsula and are comprised of two relatively distinct habitat types: the first being open mallee formations on loamy calcareous soils (eg. *Eucalyptus gracilis*, *E. oleosa*, *E. socialis*) and the second being shrubby mallee habitats on deep sands (*E. incrassata*). Threatened plant species include Jumping Jack Wattle (*Acacia enterocarpa*), Resin Wattle (*Acacia rheticarpa*), Silver Daisy Bush (*Olearia pannosa*) and numerous orchid species. Threatened fauna include a range of declining mallee birds.



Nested Assets		AUS	SA
PLANT COMMUNITIES	Mallee Communities on plains (<i>Eucalyptus gracilis</i> , <i>E. oleosa</i> , <i>E. socialis</i>)		
PLANT COMMUNITIES	Sand Mallee Communities (<i>Eucalyptus incrassata</i>)		
PLANT COMMUNITIES	Yacca (<i>Xanthorrhoea semiplana</i>) Shrubland at Stansbury		
MAMMAL ASSEMBLAGE	Western Grey Kangaroo, Bats, Echidnas		
REPTILE ASSEMBLAGE	Goannas		
THREATENED BIRDS	Southern Scrub Robin (<i>Drymodes brunneopygia</i>) Shy Heath Wren (<i>Calamanthus cautilus</i>)		R
THREATENED PLANTS	Jumping Jack Wattle (<i>Acacia enterocarpa</i>) Resin Wattle (<i>Acacia rheticarpa</i>) Silver Daisy Bush (<i>Olearia pannosa</i>) Orchids (<i>Caladenia macroclavia</i> , <i>C. brumalis</i> , <i>Prasophyllum goldsackii</i>)	EN VU VU E/V	E V V E/V
KEY LOCATIONS	Ramsay Conservation Park		

2. Identification of Conservation Assets

2.2.7 Open Woodlands

Open woodlands are dominated by Mallee Box (*Eucalyptus porosa*), Dryland Tea-tree (*Melaleuca lanceolata*) and Drooping Sheoak (*Allocasuarina verticillata*) usually over an open sedge or low shrub ground layer. These woodlands were once contiguous from Corny Point across the northern part of the 'foot' and up the western 'leg' of the peninsula. The largest areas now occur between Innes National Park and Warrenben Conservation Park and near Minlaton, Curramulka and Port Vincent. Open woodlands provide important habitat for range of declining woodland birds and threatened orchid species.



Nested Assets		AUS	SA
PLANT COMMUNITIES	Drooping Sheoak (<i>Allocasuarina verticillata</i>) Woodlands		
PLANT COMMUNITIES	Mallee Box (<i>Eucalyptus porosa</i>) Woodlands		
PLANT COMMUNITIES	Dryland Tea-tree (<i>Melaleuca lanceolata</i>) Woodlands		
PLANT COMMUNITIES	Black Grass (<i>Gahnia lanigera</i>), Sword-Sedge (<i>Lepidosperma sp.</i>) Sedgeland		
MAMMAL ASSEMBLAGE	Western Grey Kangaroos, Brushtail Possums, Bats, Echidnas		
BIRD ASSEMBLAGE	Declining Woodland Birds – Hooded Robin, Crested Bellbird, Jacky Winter, Dusky Woodswallow, Sittella, Bushlarks, Horsefield's Bronze Cuckoo, Restless Flycatcher, Crested Bellbird, Scarlett Robin, Painted Button-quail		
REPTILE ASSEMBLAGE	Rosenberg Goanna, Snakes		
THREATENED BIRDS	Diamond Firetail (<i>Stagonopleura guttata</i>) Bush Stone Curlew (<i>Burhinus grallarius</i>)		V R
THREATENED PLANTS	Silver Daisy Bush (<i>Olearia pannosa ssp pannosa</i>), 5 nationally threatened orchids (<i>Caladenia macroclavia</i> , <i>C. brumalis</i> , <i>C. intuta</i> , <i>Prasophyllum goldsackii</i> , <i>P. praecox</i>)	VU E/V	V E/V
KEY LOCATIONS	Innes NP, Warrenben CP, Ramsey CP, Pt Moorowie, Brentwood Cemetery, Stansbury, Daly Head, Kangaroo Flat, Minbura Reserve		

2.2.8 Offshore Islands

Offshore islands include Wardang Island and Goose Island off the west coast of the peninsula, the Althorpe Islands group off the south-western tip of the peninsula and Troubridge Island (the only sand island) off the south-eastern coast near Edithburgh. Also included in this asset are the small nearshore islands of Innes National Park.



Nested Assets		AUS	SA
PLANT COMMUNITIES	Coastal Dune Shrublands (e.g. <i>Olearia axillaris</i> , <i>Leucopogon parviflorus</i>)		
PLANT COMMUNITIES	Coastal Cliff Low Shrublands (e.g. <i>Lasiopetalum discolor</i> , <i>Leucophyta brownii</i>)		
KEY HABITAT AREAS	Sandy beaches (Troubridge Island), tidal flats (eastern side of Wardang), rocky shores and cliffs (Althorpe Island, Innes NP Islands)		
MAMMAL ASSEMBLAGE	Tamar Wallaby (reintroduced to Wardang Island), Bats, NZ Fur Seals, Australian Sea Lions (<i>Neophoca cinerea</i>) - Haul-out Areas	VU	V
BIRD ASSEMBLAGE	Raptors – White-bellied Sea-eagles, Ospreys, Peregrine Falcons, Shorebirds – e.g. Ruddy Turnstone, Oyster Catchers, Sandpipers, Plovers, Stints, Knots, Godwit, Seabirds – e.g. Terns, Shearwaters, Little Penguins, Mutton Birds		
REPTILE ASSEMBLAGE	Sand Goanna, Snakes, Stumpy Lizard		
THREATENED BIRDS	White-bellied Sea-eagle (<i>Haliaeetus leucogaster</i>) Osprey (<i>Pandion cristatus</i>)		E E
KEY LOCATIONS	Troubridge Islands, Althorpe Island, Innes N.P. Islands, Wardang Island, Goose Island		

2. Identification of Conservation Assets

2.2.9 Southern Hairy-nosed Wombat

Southern Hairy-nosed Wombat (*Lasiorhinus latifrons*) populations are considered at risk of serious decline on the Yorke Peninsula with only 640 individuals from 24 colonies estimated to remain in 2010 (Taggart & Sparrow 2010). Of the 24 colonies remaining, 21 were estimated to have less than 20 individuals. The most significant population occurs near Point Pearce in the north-west of the region.



Nested Assets		AUS	SA
TOTAL POPULATION	Approximately 640 individual wombats		
COLONIES	24 colonies on Southern Yorke Peninsula		
KEY LOCATIONS	Central-western leg of Yorke Peninsula, Point Pearce		

2.2.10 Small Mammals

Small to medium-sized mammals are vulnerable to predation by foxes and cats and have largely disappeared from southern South Australia. Sub-fossil records indicate that 18 small mammal species have become locally extinct on the Southern Yorke Peninsula including Bandicoots, Bilbies, Dunnarts, Phascogales, Bettongs and Potoroos. Mammal species still present include Western Pygmy Possums, Brushtail Possums, Southern Hairy-nosed Wombats, Western Grey Kangaroos, Echidnas and bats. The Tammar Wallaby has been re-introduced to Wardang Island and has also recently been reintroduced to Innes National Park from populations that were historically introduced to New Zealand.



Nested Assets		AUS	SA
EXTANT SMALL MAMMALS	Western Pygmy Possum (<i>Cercartetus concinnus</i>) Brushtail Possum (<i>Trichosurus vulpecula</i>) Tammar Wallaby (<i>Macropus eugenii</i>) Echidna (<i>Tachyglossus aculeatus</i>) Bats		R CD
EXTANT LARGE MAMMALS	Western Grey Kangaroo (<i>Macropus fuliginosus</i>) Southern Hairy-nosed Wombat (<i>Lasiorhinus latifrons</i>)		
REINTRODUCED	Tammar Wallaby (<i>Macropus eugenii</i>)		CD
LOCALLY EXTINCT	2 Bandicoot species (*Sth Brown, Western-barred)		
LOCALLY EXTINCT	1 Bilby species		
LOCALLY EXTINCT	2 Dunnart species (*Grey-bellied, *Fat-tailed)		
LOCALLY EXTINCT	*Red-tailed Phascogale		
LOCALLY EXTINCT	2 Bettong species (*Burrowing, *Brushtailed)		
LOCALLY EXTINCT	Broad-faced Potoroo		
LOCALLY EXTINCT	2 Hare-Wallabies (Banded, Eastern)		
LOCALLY EXTINCT	4 Native Mice (*Mitchells Hopping, *Plains, Goulds, *Western)		
LOCALLY EXTINCT	4 Native Rats (*Heath, *Bush, Pale Field, *Greater Stick-nest)		
KEY LOCATIONS	Innes National Park, Wardang Island		

3. Viability of Conservation Assets

3.1. Method for Assessing the Viability of Conservation Assets

The second step in the conservation action planning process is an assessment of the viability (or overall health) of the conservation assets. This is a four step process.

Step 1 Identification of a small number (3 - 5) of key ecological attributes for each conservation asset.

Key ecological attributes represent the critical factors required for the long term viability of the conservation assets. These factors relate to the size, condition and landscape context of the assets and include attributes such as hydrological regimes, fire regimes, water quality, vegetation condition, fauna diversity, total remnant area and the size and configuration of patches (refer table 3).

Step 2 Identification of appropriate monitoring indicators for each key ecological attribute.

Indicators are easily measurable factors closely related to the status of the key ecological attributes. For example, the frequency, duration and timing of flood events may be an appropriate monitoring indicator for hydrological regimes. Similarly, the presence or absence of a particular habitat-sensitive species may be an appropriate indicator for species diversity or habitat condition.

Step 3 Development of criteria for rating the current status of each indicator.

The development of criteria for rating the status of each indicator is an iterative process that typically starts as a simple qualitative assessment (e.g. lots, some, few) and is progressively developed into more refined, numeric value ranges (e.g. 1,000 megalitres of water for 3 months during late spring).

Step 4 Ranking the current status of each indicator to determine the overall viability of the conservation assets.

The final step in assessing the viability of the conservation assets is to rank the current status of each indicator based on the criteria for poor, fair, good and very good (described below). These individual ratings are rolled up in the Conservation Action Planning software to provide an assessment of the overall viability for each asset (refer table 4).

POOR - allowing the factor to remain in this condition for an extended period of time will make restoration or preventing extirpation practically impossible.

FAIR – the factor is outside its range of acceptable variation and requires human intervention. If unchecked, the target will be vulnerable to serious degradation.

GOOD – the factor is functioning within its range of acceptable variation; it may require some human intervention.

VERY GOOD – the factor is functioning at an ecologically desirable status, and requires little human intervention.

Source: adapted from Low (2003)

3.2. Viability of the Conservation Assets on the Southern Yorke Peninsula

The overall viability of the conservation assets, as assessed by the planning team, is displayed in Table 4. 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 3). The assessments were supported by existing monitoring data for some key ecological attributes and in other cases were based 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 is an area for future development (refer Section 7).

Table 5 shows that **Sub-coastal Mallee Communities** and **High Energy Coastal Cliffs and Rocky Shorelines** were assessed to be of good overall viability. **Low Energy Sheltered Coastlines, Relictual Mallee Communities, Open Woodlands, Southern Hairy-nosed Wombat populations** and Small Mammals were assessed to be poor.

3. Viability of Conservation Assets

Table 3: Key Ecological Attributes of the Conservation Assets

Conservation Asset	Landscape Context Key Ecological Attributes	Condition Key Ecological Attributes	Size Key Ecological Attributes
1. High Energy Coastal Dunes & Sandy Beaches	<ul style="list-style-type: none"> ● connectivity to adjacent vegetation communities ● natural dune formation processes 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition 	<ul style="list-style-type: none"> ● total area remaining
2. High Energy Coastal Cliffs & Rocky Shorelines	<ul style="list-style-type: none"> ● connectivity to adjacent vegetation communities 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition 	<ul style="list-style-type: none"> ● total area remaining
3. Low Energy Sheltered Coastlines	<ul style="list-style-type: none"> ● connectivity to adjacent vegetation communities ● tidal deposition patterns 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition ● water quality 	<ul style="list-style-type: none"> ● total area remaining
4. Inland Wetlands	<ul style="list-style-type: none"> ● connectivity to adjacent vegetation communities ● hydrological regime 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition ● water quality 	<ul style="list-style-type: none"> ● total area remaining
5. Sub-coastal Mallee Communities	<ul style="list-style-type: none"> ● patch size, shape and configuration 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition 	<ul style="list-style-type: none"> ● total area remaining
6. Relictual Mallee Communities	<ul style="list-style-type: none"> ● patch size, shape and configuration 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition 	<ul style="list-style-type: none"> ● total area remaining
7. Open Woodlands (Sheoak, Mallee Box, Dryland Tea-tree)	<ul style="list-style-type: none"> ● patch size, shape and configuration 	<ul style="list-style-type: none"> ● fauna diversity & abundance ● flora diversity & composition 	<ul style="list-style-type: none"> ● total area remaining
8. Offshore Islands		<ul style="list-style-type: none"> ● flora diversity ● seabird / shorebird diversity ● terrestrial birds / mammals diversity & abundance 	<ul style="list-style-type: none"> ● vegetation cover remaining
9. Southern Hairy-nosed Wombat	<ul style="list-style-type: none"> ● genetic diversity ● habitat availability 	<ul style="list-style-type: none"> ● health of population ● reproduction success 	<ul style="list-style-type: none"> ● total population size ● number / size of colonies
10. Small Mammals	<ul style="list-style-type: none"> ● genetic diversity ● habitat availability 	<ul style="list-style-type: none"> ● viability (health) of extant small mammal population ● habitat suitability / condition 	<ul style="list-style-type: none"> ● small mammal species diversity (compared to pre-European diversity)

Note: Status of Key Ecological Attributes - Poor, Fair, Good

Table 4: Viability Ratings of the Conservation Assets

	Conservation Asset	Landscape Context	Condition	Size	Overall Viability
1	High Energy Coastal Dunes & Sandy Beaches	Fair	Fair	Good	Fair
2	High Energy Coastal Cliffs & Rocky Shorelines	Good	Fair	Good	Good
3	Low Energy Sheltered Coastlines	Poor	Poor	Fair	Poor
4	Offshore Islands	-	Fair	Fair	Fair
5	Inland Wetlands	Poor	Poor	Good	Fair
6	Sub-coastal Mallee Communities	Good	Fair	Good	Good
7	Relictual Mallee Communities	Poor	Poor	Poor	Poor
8	Open Woodlands (Sheoak, Mallee Box, Dryland Tea-tree)	Fair	Poor	Poor	Poor
9	Southern Hairy-nosed Wombat	Poor	Poor	Poor	Poor
10	Small Mammals	Poor	Poor	Poor	Poor
Overall Landscape Viability					Fair

4. Threats to Conservation Assets

4.1. Method for Assessing Threats

The third step in the conservation action planning process involves the identification of high priority threats to the conservation assets. This is a two step process.

The first step involves an assessment of the severity of the key stresses to the conservation assets. Stresses are inversely related to the key ecological attributes (refer section 3) and may include altered fire regimes, altered hydrological regimes, altered species diversity, reduced water quality, habitat fragmentation, etc. Stresses are ranked from very high to low based on:

- **severity of 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, Medium - moderately degrades, Low - slightly impairs);
- **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, High - widespread, Medium - localised, Low - very localised).

The second step in the process involves the identification and ranking of the source of stresses (i.e. the direct threats). For example, the source of stress for reduced species diversity may be total grazing pressure or the source of stress for altered hydrological regimes may be river extraction. Sources of stress are ranked from very high to low based on:

- **contribution of the source to the stress** i.e. expected contribution of the source, acting alone, to the full expression of the stress under current circumstances (i.e. Very High - very large contributor, High - large contributor, Medium - moderate contributor, Low - small contributor).
- **irreversibility of the stress caused by the source** (Very High - not reversible, High - reversible, but not practically affordable, Medium - reversible with reasonable commitment of resources, Low - easily reversible at low cost).

Once the stresses and sources are ranked according to the above criteria, a summary rating for each threat is generated by the Conservation Action Planning (CAP) software. This results in the threats summary table (refer table 5) that allocates a ranking for each threat from very high to low, both in terms of the threat to the individual conservation assets and to the collective impact of the threat across the landscape.

Source: adapted from (Low 2003)

4.2. Threats to the Conservation Assets on the Southern Yorke Peninsula

The key threats to the conservation assets, as assessed by the planning team, are displayed in Table 5. The table shows that habitat fragmentation, environmental weeds, inappropriate coastal recreational access, introduced carnivores (foxes and cats) and incompatible stock grazing were assessed as the highest threats to the conservation assets across the region.

4. Threats to Conservation Assets

Table 5: Medium to High Ranked Threats to the Conservation Assets

Threats Across Targets	High Energy Coastal Dunes	High Energy Coastal Cliffs	Low Energy Sheltered Coast	Off-shore Islands	Inland wetland	Sub-Coastal Mallee	Relictual Mallee	Open Woodland	Sth Hairy-nosed Wombats	Small Mammals	Overall Threat Rank
Habitat Fragmentation (from historical land clearance)	Medium	Medium	High	Medium	High	Medium	High	High	Medium	High	Very High
Weeds (Bridal Creeper / Veil, Boxthorn, Boneseed, A. cyclops, etc)	High	Medium	High	High	Medium	High	Medium	High			High
Incompatible Adjacent Land Management (eg. spray drift, weeds, crops, fertilisers)		Low	High		High	Low	Medium	Medium	Very High		High
Introduced Carnivores (Foxes, Cats)	High	Low	High	Medium	Medium	High	Medium	Medium		High	High
Inappropriate Recreational Access (vehicles, access tracks)	High	Medium	High	Low	Medium						High
Historical Extinction										Very High	High
Climate Change (extreme drought / temperatures, sea level rise)	Medium	Medium	High	Not Assessed	High	Not Assessed	Not Assessed	Not Assessed	High	Not Assessed	High
Incompatible Stock Grazing & Access	Medium				High	Medium	Medium	High			High
Introduced Herbivores (eg. Rabbits, mice, hares)	Medium	Low	Medium	High	Medium	Medium	Medium	Medium			High
Incompatible Fire Regimes (large, frequent fires, fire suppression)					Low	High	Medium	Medium			Medium
Disease (Sarcoptic Mange)									High		Medium
Inbreeding									High		Medium
Future Clearance (roads, residential, mining, marinas, wind farms)	Low	Low	Medium		Medium	Medium	Medium	Low			Medium
Native Herbivores (kangaroos)					Medium	Low	Low	Medium			Medium

4. Threats to Conservation Assets

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5. Setting Conservation Objectives

5.1. Method for Setting Conservation Objectives

The fourth step in the conservation action planning process involves setting measurable objectives that, if achieved, would ensure the long term conservation of the assets. In particular, objectives are developed in line 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. Some useful considerations for setting conservation objectives relating to size, condition and landscape context are described below:

Size: Species-area curves provide useful guidelines for setting goals relating to the amount of habitat required for conservation. A variety of studies indicate that, as a general rule, retaining 30-40 percent of pre-European extent will conserve 80-90 percent of species associated with a particular habitat type (Dobson 1996, Nachlinger et al. 2001). As a general rule, a minimum 30-40 percent area target may be applied for conservation assets that have not been subject to broad scale clearance. For highly depleted or restricted conservation assets this may be raised to 50 percent.

Condition: Condition attributes such as flora and fauna diversity and water quality are often poorly recorded at the landscape scale but are integral to the concept of functional landscapes. Maintaining ecological integrity over long time periods requires condition attributes functioning within their natural range of variation over specified geographical areas and time periods. Historical condition benchmarks (i.e. pre-European), when available, provide a useful reference point for goal setting; however, caution should be applied due to the likely influence of climate change (Harris et al. 2006) and historical degradation (e.g. salinity). In some regions, benchmark conditions may be referenced to regional condition monitoring manuals (e.g. NCSSA Bushland Condition Monitoring)

Landscape Context: The spatial distribution of habitat “patches” and key disturbance events such as fire and hydrological regimes are critical to conservation at the landscape scale. Much of the theory relating to the spatial distribution of habitat is underpinned by metapopulation theory in which independent species populations may eventually go extinct due to the incremental impacts of wildfire, weeds, predation and population dynamics. The protection and management of existing populations, habitats and refugia, together with the restoration of terrestrial and aquatic processes is therefore critical to landscape conservation. Factors for goal setting relating to the spatial distribution of patches include the size, shape, number and distance between patches. Goals for fire and hydrological regimes should consider the timing, frequency, duration and extent.

5.2. Conservation Objectives for the Southern Yorke Peninsula

Based on the threat assessment for the medium and high ranked threats to the conservation assets on the Southern Yorke Peninsula (refer Table 5), 15 conservation objectives have been developed by the planning team. In some cases the conservation objectives do not yet have measurable area targets. This reflects the early stage of the planning process and identifies a knowledge gap which will be addressed through further analysis.

Three additional foundational objectives are also presented in this section. Foundational objectives underpin the development and successful implementation of landscape-scale projects and address project funding, community engagement and knowledge gaps.

5. Setting Conservation Objectives

3 Foundational Objectives

Funding Objective:

From 2011, attract sufficient annual funding for the successful implementation of the Southern Yorke Peninsula conservation project.

Community Support and Partnerships Objective:

By 2013, consolidate organisational partnerships and community support for the Southern Yorke Peninsula conservation project.

Knowledge Gaps and Research Objective:

By 2016, secure key ecological knowledge for the successful the implementation of the Southern Yorke Peninsula conservation project.

15 Conservation Objectives

Habitat Fragmentation Objective:

By 2020, XX,000 hectares of strategic, landscape-scale revegetation of Open Woodlands and Relictual Mallee to support the habitat needs (patch size, shape, connectivity) of declining woodland birds.

Environmental Weeds Objective:

By 2015, eradication of outlying occurrences of priority environmental weeds (Bridal Creeper, Bridal Veil, Boneseed, Boxthorn, Cyclops, White Weeping Broom) and on-going reduction of core infestations to protect high value habitat.

Introduced Carnivore Objective:

By 2020, achieve desired distribution, population size and age classes for identified ground dwelling fauna threatened by foxes and cats (e.g. Mallee Fowl, Tammar Wallabies, Goannas, Shorebirds, Echidnas, Bush-stone Curlews).

Coastal Recreational Impacts Objective:

By 2020, restrict access to highly sensitive coastal breeding sites (Hooded Plovers, White-bellied Sea Eagles, Ospreys) and achieve 'good' vegetation condition in other priority areas impacted by recreational activities.

Historical Extinctions and Conservation of Small Mammals Objective:

By 2020, secure the long term viability of remaining small mammal species and successfully reintroduce locally extinct species that restore a key ecosystem function.

Climate Change Objective:

By 2020, identify and implement actions to mitigate the impacts of Climate Change on vulnerable conservation assets, particularly coastal ecosystems, inland wetlands and wombat populations.

Inappropriate Stock Grazing Objective:

By 2020, sustainable stock grazing regimes improve vegetation condition to 'good' across XX,000 hectares of Open Woodland and Relictual Mallee with priority to threatened species habitat and key landscape linkages.

Introduced Herbivore / Kangaroo Control Objective:

By 2020, achieve 'good' vegetation condition and improved viability of palatable threatened plant species across XX,000 hectares of priority habitat (Open Woodlands, threatened flora habitat, recently burnt areas) impacted by rabbits and abundant kangaroos.

Inappropriate Fire Regimes Objective:

By 2020, evidence-based, landscape-scale fire management regimes are in place for sub-coastal mallee communities that minimise the risk to flora and fauna populations from large fires and maximise habitat and species diversity.

5. Setting Conservation Objectives

Wombat Disease, Inbreeding and Adjacent Land Management Objective:

By 2015, secure long term protection of at least 3 significant wombat habitat areas (colonies) with greater than 1,000 individuals in total and ongoing measurable improvement in genetic diversity and health (long term objective: 6 key areas and 2000 individuals by 20XX).

Future Clearance & New Developments Objective:

By 2015, ensure new developments and associated clearance (e.g. for roads, residential, marinas, mines, wind farms) are restricted to environmentally appropriate designs and locations and no further developments in regionally significant ecological areas.

Wetland Protection - Stock Grazing, Vegetation Clearance Objective:

By 2020, protect high priority wetlands (Peeseey Swamps, Thidna swamps, The Drain) and associated low energy coastlines from Point Davenport to Hardwicke Bay from the impacts of adjacent land management and stock access.

Offshore Islands – Historical Land Clearance, Introduced Plants and Animal Control Objectives:

By 2020, ongoing annual reduction in the density and distribution of priority pest plants (inc red alert species) and animals (cats, mice, rats) on off-shore islands to secure their role as important wildlife sanctuary for seabirds and shorebirds (and for future species reintroductions)

By 2020, re-establish 950 hectares of suitable habitat on Wardang Island, representative of pre-European vegetation communities, to support the recolonisation and reintroduction of terrestrial birds and small mammals.

Conservation of Nationally Threatened Plants Objective:

By 2020, achieve ongoing improvement in the condition of nationally threatened plant populations (i.e. increased regeneration, recruitment, area occupied, # of individuals) in greater than 80% of recorded Relictual Mallee and Open Woodland sites.

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6 Conservation Strategies and Actions

6.1. Method for Developing and Prioritising Conservation Strategies

The fifth step in the conservation action planning process involves the identification of effective strategies and action steps to achieve the conservation objectives developed in Section 5. This is a three step process.

Step 1 Conduct a thorough situation analysis of the key factors related to the conservation objectives. This includes consideration of the causal factors underlying particular threats and potential hurdles for enhancing the condition of conservation assets (e.g. social, cultural, economic and individual motivations). This can help pinpoint opportunities for intervention and guide decisions about which delivery mechanisms are best employed to achieve the conservation objectives (e.g. direct landholder targeting, use of volunteers or contractors, market based instruments, education programs, and legislative or policy changes).

Step 2 Brainstorm conservation strategies and action steps. Conservation strategies and action steps are the broad courses of action required to achieve the conservation objectives. There are essentially three “pathways” for strategy development that should be considered for threat abatement objectives. These include:

- direct protection or management of land or water;
- influencing a key decision maker;
- addressing a key underlying factor.

Once the major strategies are identified, they may be broken down into smaller, more detailed action steps.

Step 3 Prioritise conservation strategies and action steps according to a cost-benefit and feasibility analysis. Useful considerations for prioritising strategies and action steps include the relative conservation value of the asset (e.g. nationally threatened habitat type), its level of threat, the contribution of the strategy to meeting the conservation objective, the duration of the benefit achieved and the potential leverage of the action (e.g. high profile site that provides a catalyst for further action). Feasibility of implementation should also be considered including the total cost and time required to implement the strategy, the ease of land access and the degree to which a lead individual or institution exists to implement the strategy. It may be useful to initially prioritise a small number of conservation strategies that provide a mix of high benefit and high feasibility (i.e. low hanging fruit) actions. In particular the high feasibility actions ensures that a project can get some early ‘runs on the board’ to leverage investment into the more complex and costly strategies.

Use of Conceptual Models

Conceptual models are increasingly being used for strategy development in conservation planning. A conceptual model is a visual method (diagram) of representing a set of causal relationships between factors that are believed to impact on one or more of the conservation assets. A good model should explicitly link the conservation assets to the direct threats impacting them, the factors (i.e. indirect threats) influencing the direct threats, and the strategic activities proposed to mitigate those factors (WWF 2005).

The Miradi software program (www.miradi.org) can be used to develop conceptual models and fully supports the Conservation Action Planning (CAP) process. The software was developed by the Conservation Measures Partnership (a consortium of international NGO’s) seeking to develop a common language and approach to the design, management and monitoring of conservation programs. It is recommended that projects that have applied the CAP process investigate the use of Miradi and conceptual models during the strategy development process.

6.2. Conservation Strategies and Action Steps for the Southern Yorke Peninsula

The following section presents the conservation strategies and action steps developed by the planning team to achieve the three foundational objectives and 15 conservation objectives identified in Section 5. A prioritisation process within the CAP software has also been applied to identify high priority strategic actions based on an assessment of their benefit, cost and feasibility. Conservation strategies are ordered from very high priority to low priority. It is important to note that the development and prioritisation of conservation strategies and action steps is an ongoing, iterative process. It is anticipated that over time these will be refined as knowledge is improved and the feasibility of implementation is better understood.

6. Conservation Strategies and Actions

6.3. FOUNDATIONAL PROGRAM - OBJECTIVES AND STRATEGIC ACTIONS

Objective: From 2011, attract sufficient annual funding and resources for the successful implementation of the Southern Yorke Peninsula project.

Strategy: Investment and Fund Raising

Priority: NOT ASSESSED

- Action Steps:**
1. Funding applications for priority projects through traditional NRM sources
 2. Development of budgeted project proposals and investment prospectus
 3. Development of a promotional material (e.g. DVD) to support investment prospectus
 4. Project Launch with investment prospectus to promote awareness and investment
 5. Engagement with corporates and the philanthropic sector to secure investment for projects
 6. Carbon offset viability assessment to determine the feasibility of attracting carbon investment

Objective: By 2013, consolidate organisational partnerships and community support and participation in the Southern Yorke Peninsula project.

Strategy: Community Engagement and Organisational Partnerships

Priority: NOT ASSESSED

- Action Steps:**
1. Targeted landholder engagement in priority areas (including landholder mapping, contacts database)
 2. Community workshops, presentations, landholder visits and community group development
 3. Development of a project name, branding and promotional material
 4. Development of a project website
 5. Newsletter and media articles to keep community and partner organisations informed of activities
 6. Signage (site, roadside, etc) for high profile sites to promote awareness
 7. Partnership agreement between lead organisations
 8. Engagement of other key project partners
 9. Engagement with indigenous community leaders and land managers

Objective: By 2016, secure key ecological knowledge for the Southern Yorke Peninsula project.

Strategy: Knowledge, Research and Monitoring

Priority: NOT ASSESSED

- Action Steps:**
1. Ongoing conservation planning and prioritisation process (CAP, LAF, INFER, state and transition models)
 2. Collation of historical monitoring data, production state of environment report and development of a landscape monitoring framework
 3. Resource condition assessments of conservation assets including bushland condition, woodland birds, shorebirds, threatened species populations and threatening processes
 4. Establishment of monitoring sites to evaluate the effectiveness of conservation actions
 5. Habitat condition and threat mapping (e.g. weeds, grazing) across the region
 6. Research population dynamics, distributions and trends for key nested flora and fauna species

6 Conservation Strategies and Actions

6.4. CONSERVATION OBJECTIVES AND PRIORITISED STRATEGIC ACTIONS

Objective: By 2020, restrict access to highly sensitive coastal breeding sites (Hooded Plovers, White-bellied Sea Eagles, Ospreys) and achieve 'good' vegetation condition in other priority areas impacted by recreational activities.

Strategy: Coastal Recreational Impact Control

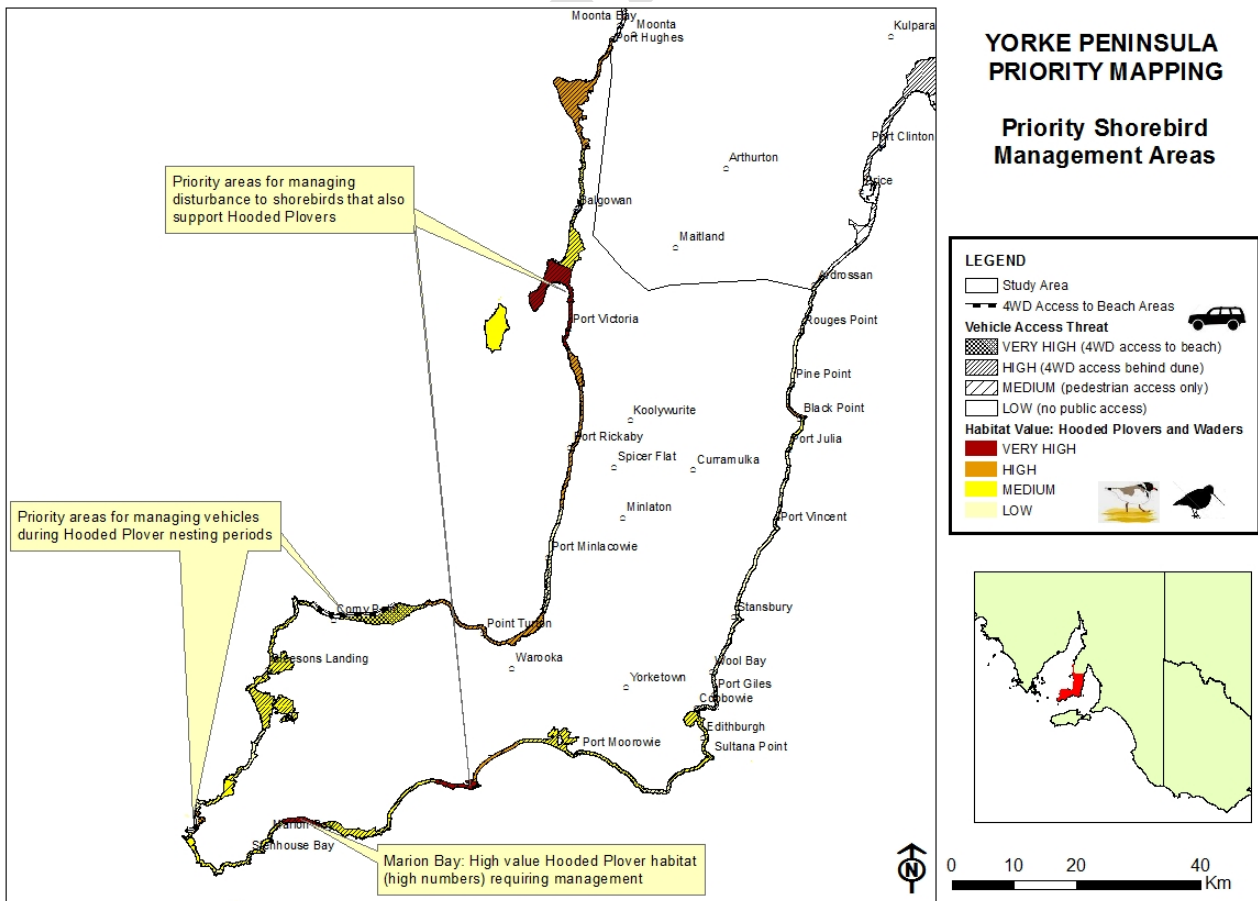
Priority: VERY HIGH

Action steps:

1. Identify and map **a)** areas heavily impacted by recreational activities, and **b)** sensitive coastal breeding sites
2. Identify critical timing to concentrate protection efforts and species habitat ranges (e.g. Sea Eagles view sheds) and overlay with understanding of peak time for coastal recreational activities
3. Collect baseline condition data in highly sensitive coastal breeding sites and other priority areas impacted by recreational activities
4. Survey different recreational groups causing adverse impacts (e.g. fishers, surfers, divers, bushwalkers, motorbike riders, 4WDs) to understand their needs and attitudes to different control options
5. Identify best-practice control methodologies including establishment of different zones suitable for different levels of impact (i.e. complete exclusion, low level interaction, high level)
6. Implement improved infrastructure projects and education program for less sensitive areas (i.e. access tracks, signage, formal camp grounds)
7. Establish wildlife protection zones for complete exclusion at set times (e.g. track closures, access points, physical barriers, volunteer rangers)
8. Increase enforcement and prosecution effort for those illegally causing damage through targeted blitz at peak times. Lobby for strengthening of penalties and for changes to policy of beaches as public roads.
9. Ongoing site monitoring and evaluation to determine if actions are successful. Follow up any actions and implement changes as required

Relevant Reports: Koch, P.J. (2013) *Southern Yorke Peninsula Spatial Prioritisation: Mapping Priorities for Habitat Management and Restoration*. Summary report. Unpublished Report, Greening Australia.

Mapping: Refer to Map 6.



6 Conservation Strategies and Actions

Objective: By 2020, achieve desired distribution, population size and age classes for identified ground dwelling fauna threatened by foxes and cats (e.g. Mallee Fowl, Tammar Wallabies, Goannas, Shorebirds, Echidnas, Bush-stone Curlews).

Strategy: Introduced Carnivore (Foxes, Cats) Control to Conserve Ground-dwelling Fauna

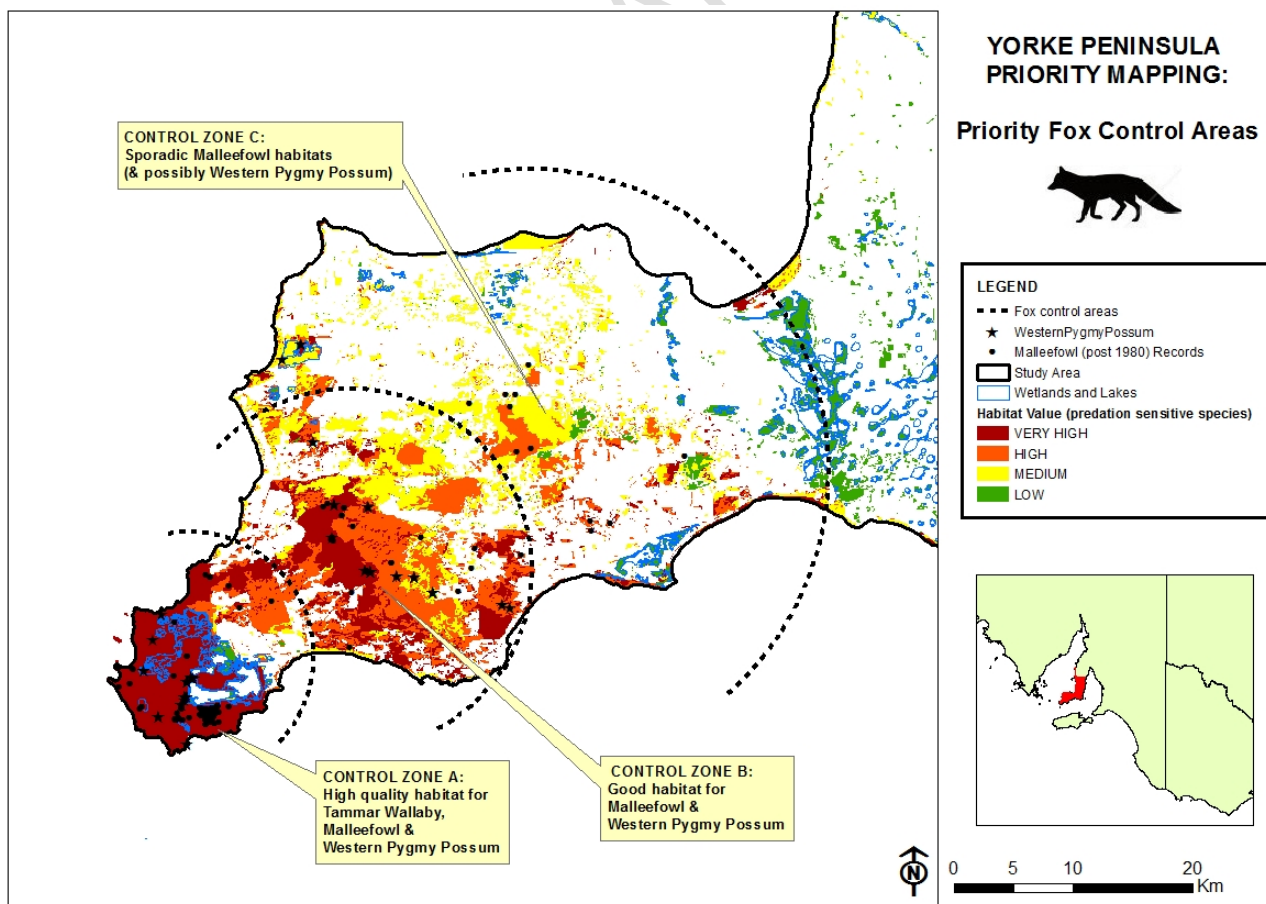
Priority: **VERY HIGH**

Action steps:

1. Identify key fauna species representative of different fauna response groups threatened by foxes and cats (e.g. Mallee Fowl, Tammar Wallaby, Hooded Plovers, etc)
2. Collect baseline data, both on public and private land, on current distribution, population size, breeding pairs and age classes of key fauna species
3. Collect baseline data on current distribution and density of foxes and cats in the landscape
4. Determine relative impact of fox and cat predation on viability of native fauna populations versus other attributes (e.g. seasonal conditions, patch size, habitat condition). Also assess relative impact of foxes versus cats on native fauna.
5. Determine desired distribution, population size, breeding pairs and age classes of key fauna species
6. Identify appropriate methodology and required level of fox and cat control required in the landscape to achieve viable native fauna populations (include budgets, priority sites and techniques)
7. Identify effective cat control techniques including lobbying for legislative change to allow baiting and compulsory cat registration. Undertake cat owner education program.
8. Undertake integrated, large-scale fox and cat control program (including provision of baits) both on public and private lands with increased effort during critical periods (e.g. Mallee Fowl hatching in November to March)
9. Ongoing monitoring and evaluation of key fauna populations to determine viability and adjust control effort as required

Relevant Reports: *Assessment of the Reintroduction Potential of regionally Extinct Fauna on Southern Yorke Peninsula*, Bush Science Services, Report to DEWNR and NYNRMB, D. Taggart 2014.

Mapping: Refer to Map 7 relating to fox control.



Map 7: Priority fox control areas, zoomed to Biodiversity fund project area.

6 Conservation Strategies and Actions

Objective: By 2015, eradication of outlying occurrences of priority environmental weeds (Bridal Creeper, Bridal Veil, Boneseed, Boxthorn, *A. cyclops*, White Weeping Broom) and on-going reduction of core infestations to protect high value habitat.

Strategy: Environmental Weed Control to Conserve High Value Habitat

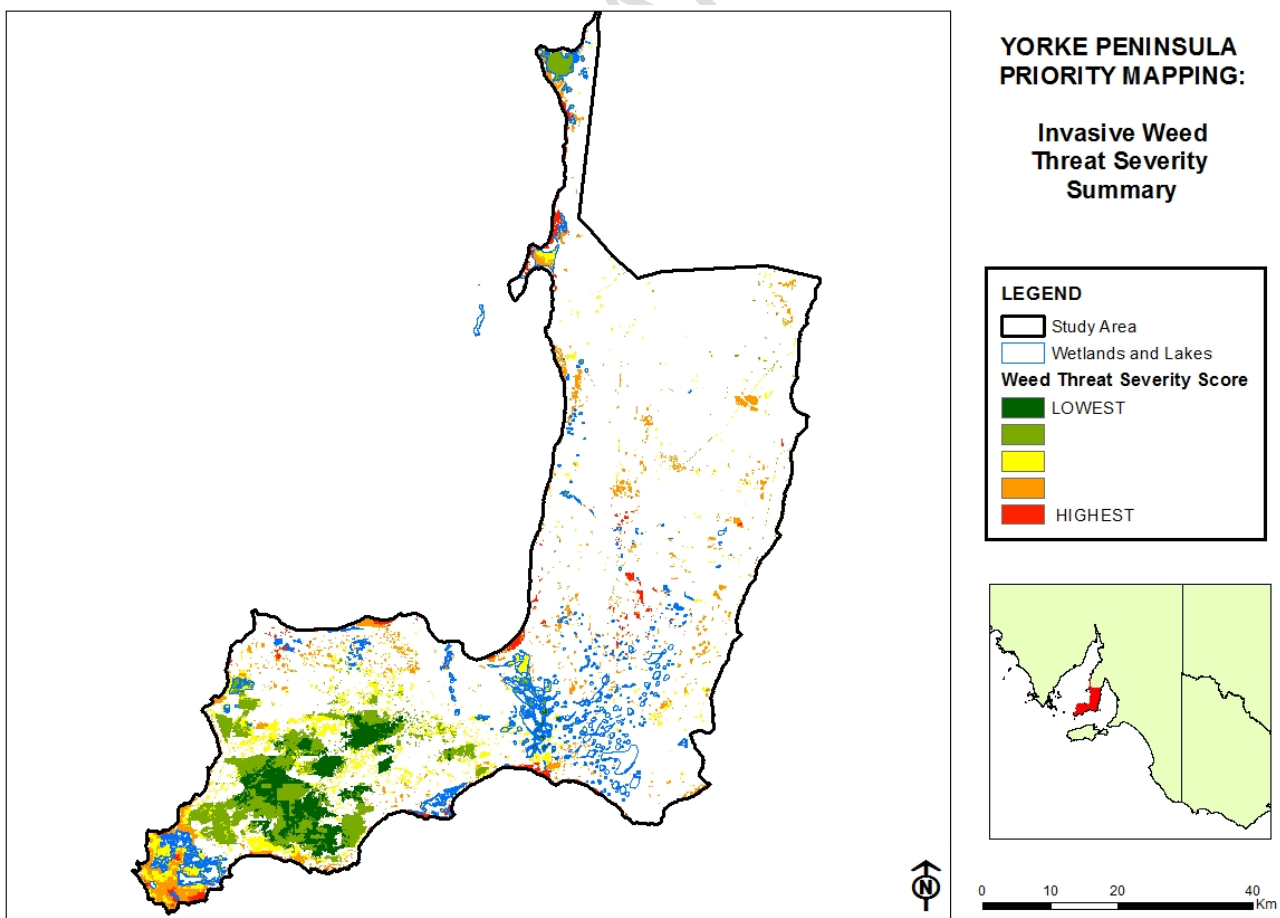
Priority: HIGH

Action steps:

1. Identification and central mapping of priority environmental weed infestations including newly emerging weeds (e.g. White Weeping Broom, Beach Daisy) and outlying occurrences
2. Identification, mapping and prioritisation of high value habitat threatened by weed infestations
3. Identification of current weed control programs and improve integration and communication across projects and tenures (Authorised Officers, TFL, TPAG, Council, Community Groups, DEWNR)
4. Review existing literature to understand biology, vectors and best practice control techniques for priority environmental weeds and develop 'Strategic Landscape-scale Weed Control Strategy' (including site prioritisation and budgets)
5. Community education re identification, control and reporting of priority weeds including a campaign to ensure local nurseries do not sell them
6. Greater legislative enforcement of control of proclaimed weeds on public and private lands
7. Engage and support volunteer community groups and NGOs (TPAG, TFL) to undertake weed control on high priority sites as per 'Strategic Landscape-scale Weed Control Strategy'
8. Engage commercial contractors, Authorised Officers and council staff to undertake weed control on high priority sites
9. Ongoing monitoring and evaluation of weed control sites and weed control strategy to ensure it is effective. Adjust strategy as required.

Relevant Reports: CAP Scoping Report #1 - *Developing Priority Weed Programs for Southern Yorke Peninsula*, Report to the Department for Environment Water and Natural Resources and the Yorke Peninsula CAP Working Group. Durant, M. (2013)

Mapping: Refer to Map 8.



Map 8: Invasive weed threat summary score, combining distribution models for 5 invasive weed species.

6 Conservation Strategies and Actions

Objective: *By 2020, evidence-based, landscape-scale fire management regimes are in place for sub-coastal mallee communities that minimise the risk to flora and fauna populations from large fires and maximise habitat and species diversity.*

Strategy: Ecological Fire Management

Priority: HIGH

Action steps:

1. Identify and map flora and fauna populations at risk of inappropriate fire regimes
2. Undertake fire age mapping (extent, timing and intensity) to understand recent fire regimes in past 50-100 years and understand current policy for future fire events (e.g. refer to 5% per year on park policy and Fire Management Plan for the Reserves of the Lower Yorke Peninsula DENR 2010)
3. Collate current knowledge re ecological fire management in similar landscapes and determine desired ecological fire regime for the Southern Yorke Peninsula
4. Determine difference between current fire management regime and desired ecological fire regime
5. Understand attitudes of major stakeholders towards adopting a new ecological fire regime (CFS, DENR, Council, private landholders, Native Vegetation Council)
6. Lobby fire management authorities to adopt stronger ecological considerations into fire policy development including changes to Native Vegetation Act relating to approval of fire on private lands
7. Develop strategies for fire management on private land
8. Community education program re the role of fire in the landscape
9. Implement desired ecological fire management regimes on public and private lands
10. Ongoing site monitoring and evaluation of burnt and unburnt areas to improve understanding of impacts. Adjust strategy as required.

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6 Conservation Strategies and Actions

Objective: By 2020, XX,000 hectares of strategic, landscape-scale revegetation of Open Woodlands and Relictual Mallee to support the habitat needs (patch size, shape, connectivity) of declining woodland birds.

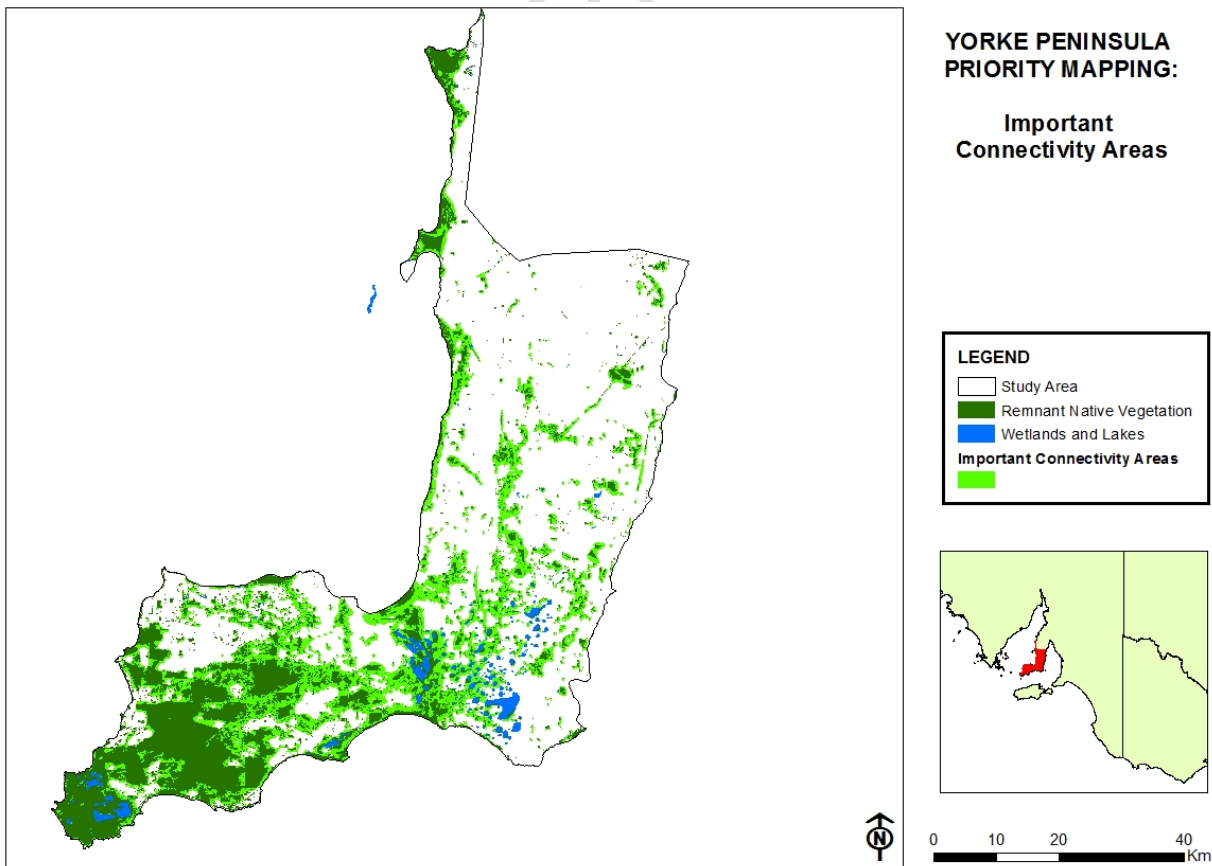
Strategy: Landscape-scale Habitat Reconstruction for Threatened Birds

Priority: HIGH

- Action steps:**
1. Identify key declining fauna species that require an increase in total extent, average patch size, condition and connectivity of habitat. Determine distribution and baseline condition of declining species populations and related habitat types.
 2. Determine required total area, patch size, condition and connectivity of habitat to achieve viable species populations. Identify strategic areas for habitat reconstruction through the development of a priority area map (i.e. GIS spatial analysis).
 3. Identify land ownership in key areas and engage land managers to understand attitudes to large scale habitat reconstruction (e.g. required incentives, stewardship, lease, purchase of land)
 4. Determine best-practice methodologies for reconstruction of specific habitat types for key fauna and determine overall cost and priority sites. Develop a costed implementation plan.
 5. Develop investment options for large scale revegetation through a carbon analysis of the landscape and links to Carbon Farming Initiative and Native Vegetation Council Significant Environmental Benefits Fund
 6. Develop seed supply strategy and local seedbank to support large-scale, long term habitat reconstruction of specific habitat types
 7. Develop landholder education program re ecosystem services of native vegetation and integration into sustainable farm management systems (e.g. native bee pollination of agricultural crops)
 8. Secure long term access to key sites and undertake large-scale revegetation on private and public lands (through incentives, full cost funding, land purchase, lease, covenant, stewardship, etc)
 9. Ongoing site monitoring and evaluation of habitat reconstruction activities, both in terms of vegetation establishment and viability of key fauna populations. Adjust strategy as required.

Relevant Reports: Koch, P.J. (2013) *Southern Yorke Peninsula Spatial Prioritisation: Mapping Priorities for Habitat Management and Restoration*. Summary report. Unpublished Report, Greening Australia.

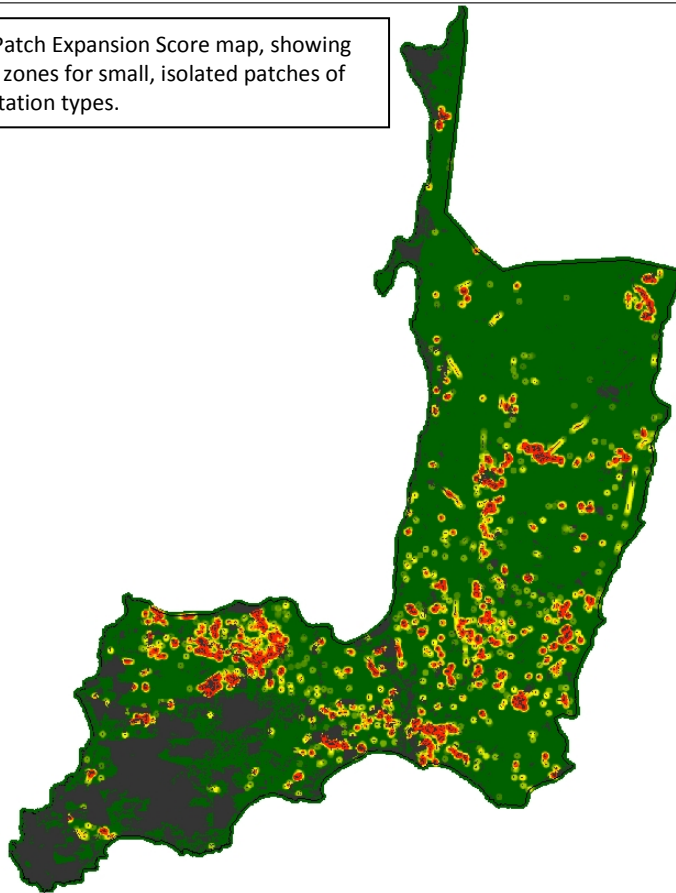
Mapping: Refer to Maps 9, 10 and 11



Map 9: Important connectivity areas, or areas with a high Landscape Context score

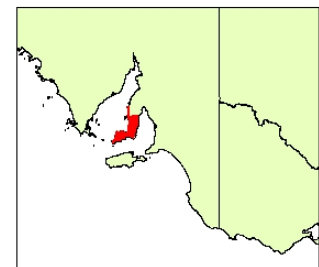
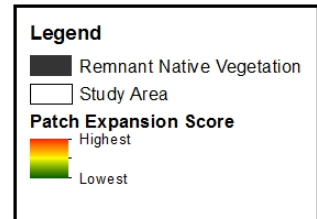
6 Conservation Strategies and Actions

Map 10: Patch Expansion Score map, showing expansion zones for small, isolated patches of focal vegetation types.



YORKE PENINSULA PRIORITY MAPPING:

Patch Expansion Score



Potential habitat expansion area or corridor for Southern Hairy-nosed Wombat with good regenerative capacity

Potential habitat expansion area/ corridor for Common Brush-tailed Possum, Red-capped Robin & Southern Whiteface

Map 11: Map showing potential project areas, prioritised by Conservation Significance Score of adjacent native vegetation. Initially based on areas with high landscape context score, but adjusted where necessary to ensure soil types associated with focal vegetation communities are targeted

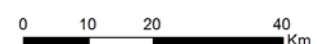
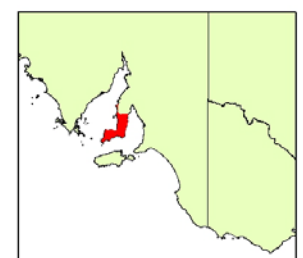
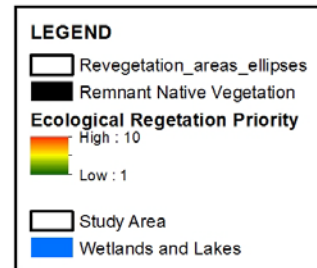
Important patch consolidation areas for Southern Scrub Robin, with likely benefits for Crested Bellbird, Varied Sitella and nationally threatened flora including: Jumping Jack Wattle and Osborne's Eyebright

Important wildlife corridor for Southern Scrub Robin, with likely benefits for Striped Honeyeater, Varied Sitella and other woodland birds

Potential restoration areas with excellent natural regenerative capacity and benefits for a range of woodland birds

YORKE PENINSULA PRIORITY MAPPING:

Ecological Revegetation Priority



6 Conservation Strategies and Actions

Objective: By 2020, protect high priority wetlands (Peeseey Swamps, Thidna swamps, The Drain) and associated low energy coastlines from Point Davenport to Hardwicke Bay from the impacts of adjacent land management and stock access.

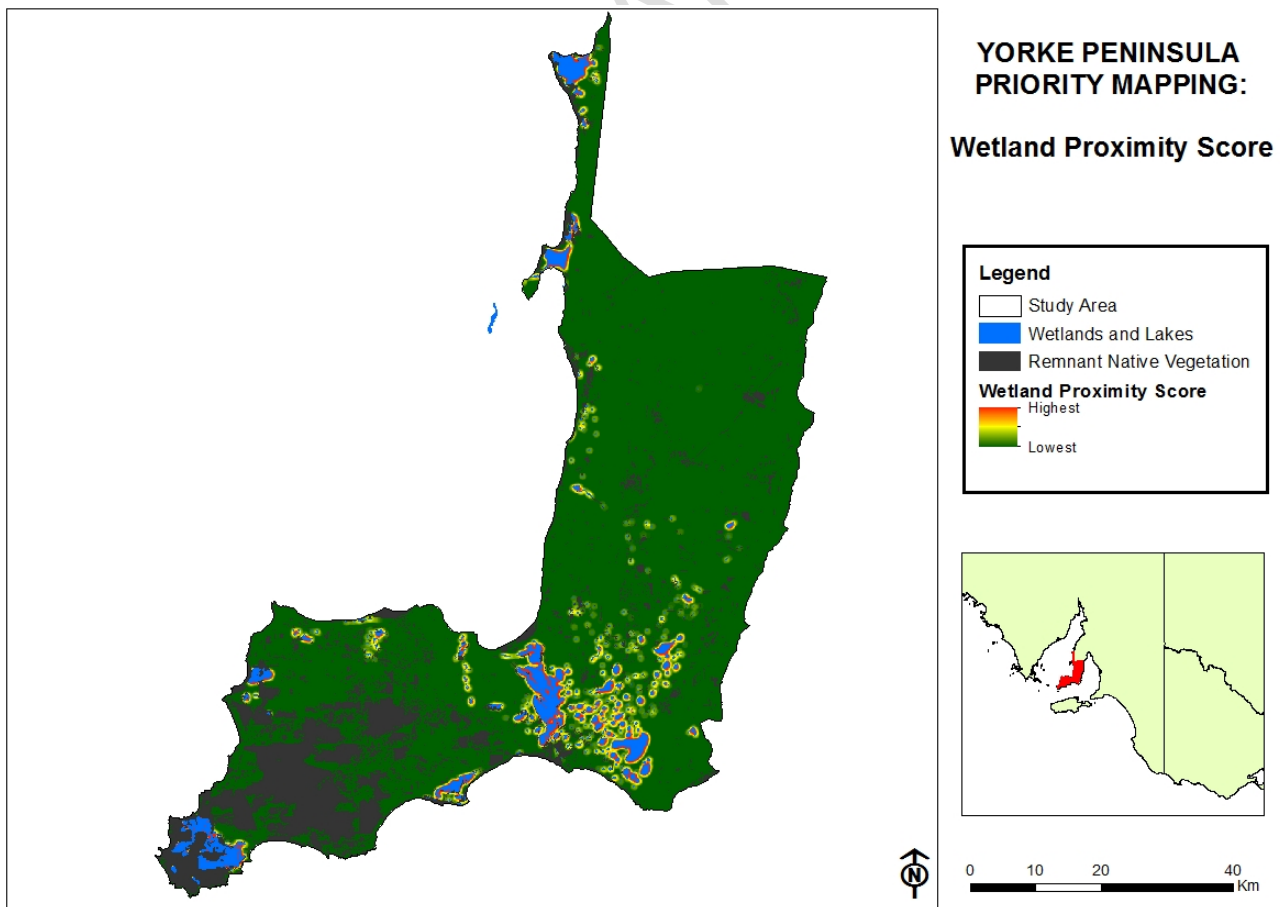
Strategy: Protection of Priority Wetlands and Associated Low Energy Coasts

Priority: HIGH

- Action steps:**
1. Identify and map land ownership of priority wetlands and low energy coastlines and key land managers to engage.
 2. Identify current levels of protection from stock access and impacts of adjacent land use (i.e. % of wetlands fenced, buffered or under formal protection).
 3. Collect baseline data on vegetation condition, water quality, presence of threatened species and habitat quality to prioritise wetlands for protection.
 4. Engage key land managers to understand attitudes to wetland protection (fencing costs, stewardship, water point relocation, etc)
 5. Prioritise areas for protection and identify overall cost and methodology (e.g. develop a detailed, budgeted project proposal).
 6. Undertake an education and awareness program on the value of Yorke Peninsula's wetlands
 7. Establish high profile demonstration site with supporting case study, education and promotional material
 8. On-ground incentives program for land managers in key areas (fencing, revegetation, water point relocation)
 9. Ongoing monitoring of flora and fauna condition and water quality of protected areas (and control sites) to determine response. Adjust strategy as required.

Relevant Reports: CAP Scoping Report #2 - Peeseey Swamps, Southern Yorke Peninsula, Report to the Northern and Yorke Natural Resources Management Board and the Yorke Peninsula CAP Working Group. Durant, M. (2013)

Mapping: Refer to Map 12.



Map 12: Wetland Proximity Score map, representing total amount of wetlands within 1km.

6 Conservation Strategies and Actions

Objective: By 2020, sustainable stock grazing regimes improve vegetation condition to 'good' across XX,000 hectares of Open Woodland and Relictual Mallee with priority to threatened species habitat and key landscape linkages.

Strategy: Sustainable Stock Grazing to Conserve Priority Habitat

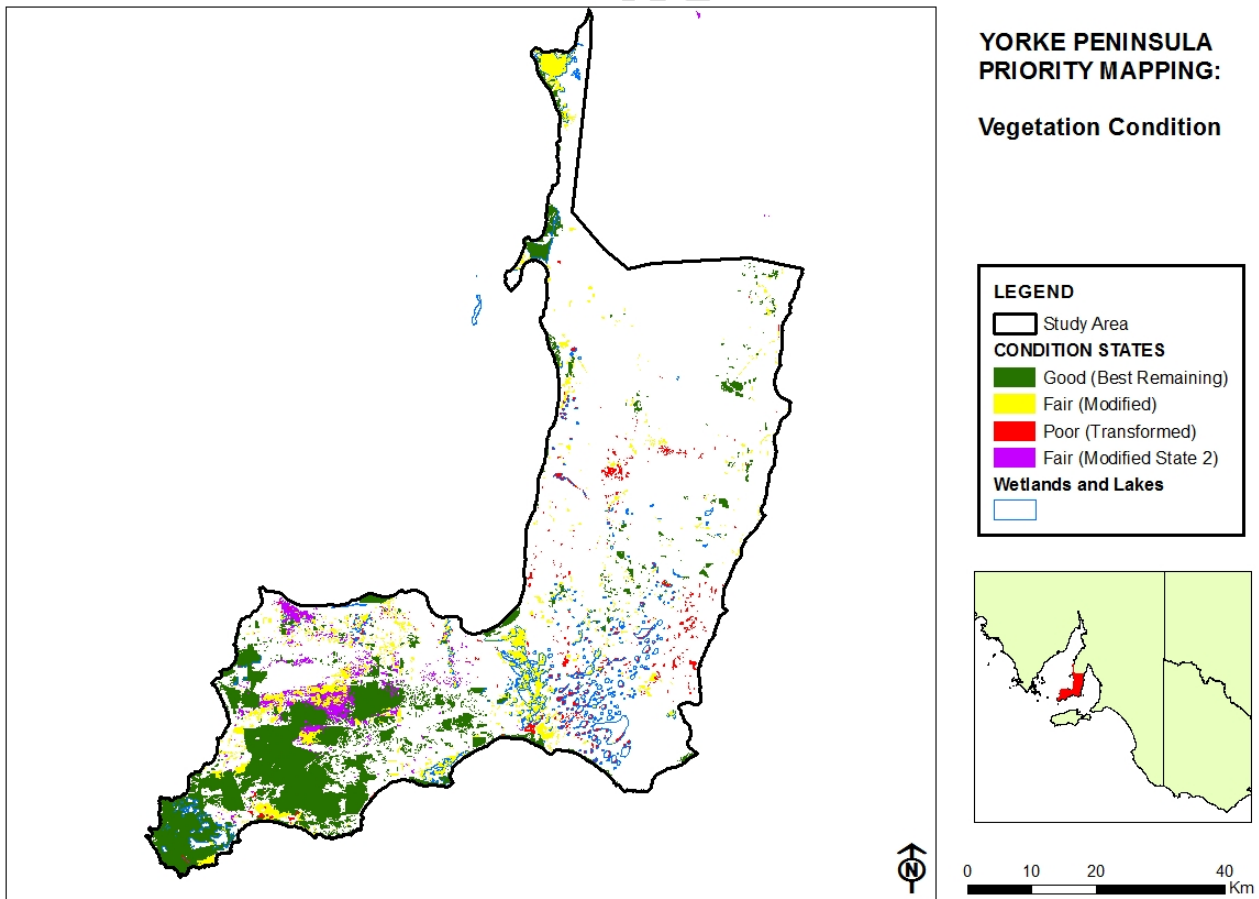
Priority: HIGH

Action steps:

1. Identify and map priority areas of Open Woodlands and Relictual Mallee that support key landscape linkages and threatened species populations
2. Identify areas in priority zone subject to stock grazing and determine key land managers to engage
3. Determine baseline condition of vegetation in areas grazed by stock and presence of key fauna and flora species
4. Understand different potential states and transitions of heavily grazed, lightly grazed and ungrazed areas. Identify benchmark reference sites
5. Partner with sustainable grazing programs in other regions to develop recommended stock grazing regimes for different condition classes. Identify current regimes implemented by landholders
6. Understand land managers attitudes to recommended grazing regimes (e.g. requirement for training, financial incentives and infrastructure)
7. Provide training program for land managers to adopt recommended grazing regimes including an understanding of the benefits of incorporating productivity with biodiversity. Establish demonstration site.
8. Provide landholder incentives (stewardship, infrastructure costs, etc), extension and training in priority areas to adopt recommended grazing regimes
9. Ongoing site monitoring and evaluation of program. Adjust strategy as required

Relevant Reports: Koch, P.J. (2013) *Southern Yorke Peninsula Spatial Prioritisation: Mapping Priorities for Habitat Management and Restoration*. Summary report. Unpublished Report, Greening Australia.

Mapping: Refer to Map 13.



Map 13: Vegetation condition states, mapped using rapid assessment techniques.

6 Conservation Strategies and Actions

Objective: By 2020, ongoing annual reduction in the density and distribution of priority pest plants (inc red alert species) and animals (cats, mice, rats) on off-shore islands to secure their role as important wildlife sanctuary for seabirds (and for future species reintroductions)

Strategy: Pest Plant and Animal Control on Off-shore Islands

Priority: HIGH

Action steps:

1. Develop an agreed, collaborative vision for conservation of off-shore islands as wildlife sanctuaries and raise community awareness and support for island conservation
2. Improve access to off-shore islands to support conservation activities (e.g. landing on Wardang, access approvals process)
3. Secure baseline monitoring data on native flora and fauna condition on off-shore islands and assess density and distribution of pest plants and animals
4. Identify best practice control methods for controlling individual pest plants and animals on islands by linking in with other island conservation initiatives
5. Develop a staged pest plant and animal control plan that considers the interaction between introduced species and native fauna habitat and prioritises species for eradication (e.g. cats) or long term control
6. Develop detailed, budgeted project proposal and investigate funding options for island conservation (IPA, corporate, philanthropic)
7. Undertake integrated, staged, ongoing control of pest plants on off-shore islands with consideration to the habitat requirements of native fauna
8. Undertake integrated, ongoing control of pest animals (cats - eradicate, rats, mice) on offshore islands with consideration to species interactions and impact on native fauna
9. Ongoing monitoring of native and introduced fauna and flora populations on off-shore islands and evaluate results of control program. Adapt management actions as required



Photo: Severe mouse infestation on Wardang Island (photo M. Durant)

6 Conservation Strategies and Actions

Objective: By 2015, secure long term protection of at least 3 significant wombat habitat areas (colonies) with greater than 1,000 individuals in total and ongoing measurable improvement in genetic diversity and health (long term objective: 6 key areas and 2000 individuals by 20XX).

Strategy 1: Wombat Community Education and Awareness

Priority: HIGH

- Action steps:**
1. Identify key land managers of wombat colonies on the Yorke Peninsula
 2. Engage land managers to understand current land use and attitudes to wombat conservation
 3. Understand broader community attitudes to Wombat conservation
 4. Ongoing, targeted education program for key land managers and broader community re wombat Conservation
 5. Ongoing monitoring and evaluation of attitudes to Wombat conservation. Adjust strategy as required.

Strategy 2: Long-term Protection and Management of Lands for Wombat Conservation

Priority: MEDIUM

- Action steps:**
1. Identify key land managers' attitudes to wombat conservation
 2. Identify appropriate mechanisms for long-term protection and management of lands for wombat conservation (e.g. land purchase, lease, stewardship payments)
 3. Research optimal habitat requirements for wombat populations (e.g. presence of native grasses, soil types, size), current condition of habitat and management techniques to restore habitat (e.g. state-transition models)
 4. Research other management options to improve wombat health such as fox control to reduce the abundance and impacts of manage
 5. Identify key areas and budgets for securing wombat habitat through land purchase and stewardship payments.
 6. Implement wombat conservation stewardship payment program for private land managers
 7. Actively target key land purchases for wombat conservation and implement ongoing management of secured properties
 8. Ongoing monitoring and evaluation of wombat populations (number, health, genetic diversity) on secured lands. Adapt strategy as required

Strategy 3: Wombat Relocation to Improve Population's Genetic Diversity

Priority: LOW

- Action steps:**
1. Identify overall genetic diversity and male to female ratio of wombat colonies on Yorke Peninsula
 2. Identify effective methodology to successfully move animals between colonies and improve genetic diversity (i.e. translocation trials that maintain individual health & support reproduction)
 3. Undertake relocation of genetically diverse individuals to improve diversity of overall population
 4. Long term monitoring and evaluation of genetic diversity of wombat populations and adapt relocation program as required

Relevant Reports: *Assessment of the Reintroduction Potential of regionally Extinct Fauna on Southern Yorke Peninsula*, Bush Science Services, Report to DEWNR and NYNRMB, D. Taggart 2014.

6 Conservation Strategies and Actions

Objective: *By 2020, secure the long term viability of remaining small mammal species and successfully reintroduce locally extinct species that restore a key ecosystem function.*

Strategy 1: Small Mammal Reintroductions

Priority: MEDIUM

Action steps:

1. Raise community awareness of small mammal extinctions and gain support for reintroductions. Lobby for internal state government agency support for reintroductions.
2. Undertake a multi-species, landscape assessment of the region to understand missing ecological functions, ecological role of locally extinct species and areas of potentially suitable habitat to prioritise small mammals for reintroductions.
3. Undertake a risk analysis (social, political, biological) and develop mitigation strategies for potential adverse impacts of small mammal reintroductions.
4. Develop a detailed budgeted project proposal to secure financial support (corporate, philanthropic, etc) of the project to secure long term, continuous funding
5. Secure habitat of potentially suitable size, condition and level of threat abatement (e.g. foxes, cats) and undertake additional habitat enhancement activities required for wild release (e.g. fire management, pest animal control)
6. Assess options for sourcing small mammals in Australia (e.g. wild populations in WA, zoos) and secure appropriate approvals through translocation plans for specific species
7. Source small mammals from wild populations and / or zoos. If required develop a local captive breeding facility to raise the required numbers and genetic diversity to support successful wild release
8. Release individuals back into the areas of suitable size, condition and level of threat abatement (e.g. off-shore islands, coastal mallee)
9. Monitoring and evaluating of small mammals reintroduced into the wild (& their ecological impact). Adapt strategies as required.

Strategy 2: Extant Small Mammal Conservation

Priority: NOT ASSESSED

Action steps: Not Assessed

Relevant Reports: *Assessment of the Reintroduction Potential of regionally Extinct Fauna on Southern Yorke Peninsula, Bush Science Services, Report to DEWNR and NYNRMB, D. Taggart 2014.*

Objective: *By 2020, achieve 'good' vegetation condition and improved viability of palatable threatened plant species across XX,000 hectares of priority habitat (Open Woodlands, threatened flora habitat, recently burnt areas) impacted by rabbits and abundant kangaroos.*

Strategy: Rabbit and Abundant Kangaroo Control to Conserve Threatened Habitat

Priority: LOW

Action steps:

1. Identify and map priority areas (e.g. Open Woodlands, threatened flora, recently burnt areas, etc) heavily impacted by rabbits and abundant kangaroos
2. Collect baseline condition data on vegetation condition and current recruitment of palatable plants in heavily impacted areas
3. Identify rabbit and kangaroo densities in high impact areas and determine relative contribution of rabbits versus kangaroos on vegetation condition and regeneration (e.g. use of exclusion plots)
4. Identify benchmark areas of 'good' vegetation condition and regeneration and determine level of rabbit and kangaroo density (e.g. identify carrying capacity of land)
5. Identify level of ongoing control required in key areas to improve vegetation condition to good and support regeneration
6. Engage key land managers in priority zones to understand attitudes to a control program
7. Identify best-practice methodologies for rabbit and kangaroo control, approximate budget, mechanisms and priority land managers and sites (i.e. develop a budgeted project proposal)
8. Use landholder incentives and commercial contractors to undertake ongoing, collaborative landscape-scale control program in key areas integrating biodiversity and land management outcomes
9. Ongoing monitoring and evaluation of vegetation condition and recruitment of palatable plants in control areas. Adjust strategy as required

6 Conservation Strategies and Actions

Objective: By 2020, achieve ongoing improvement in the condition of nationally threatened plant populations (i.e. increased regeneration, recruitment, area occupied, # of individuals) in greater than 80% of recorded Relictual Mallee and Open Woodland sites.

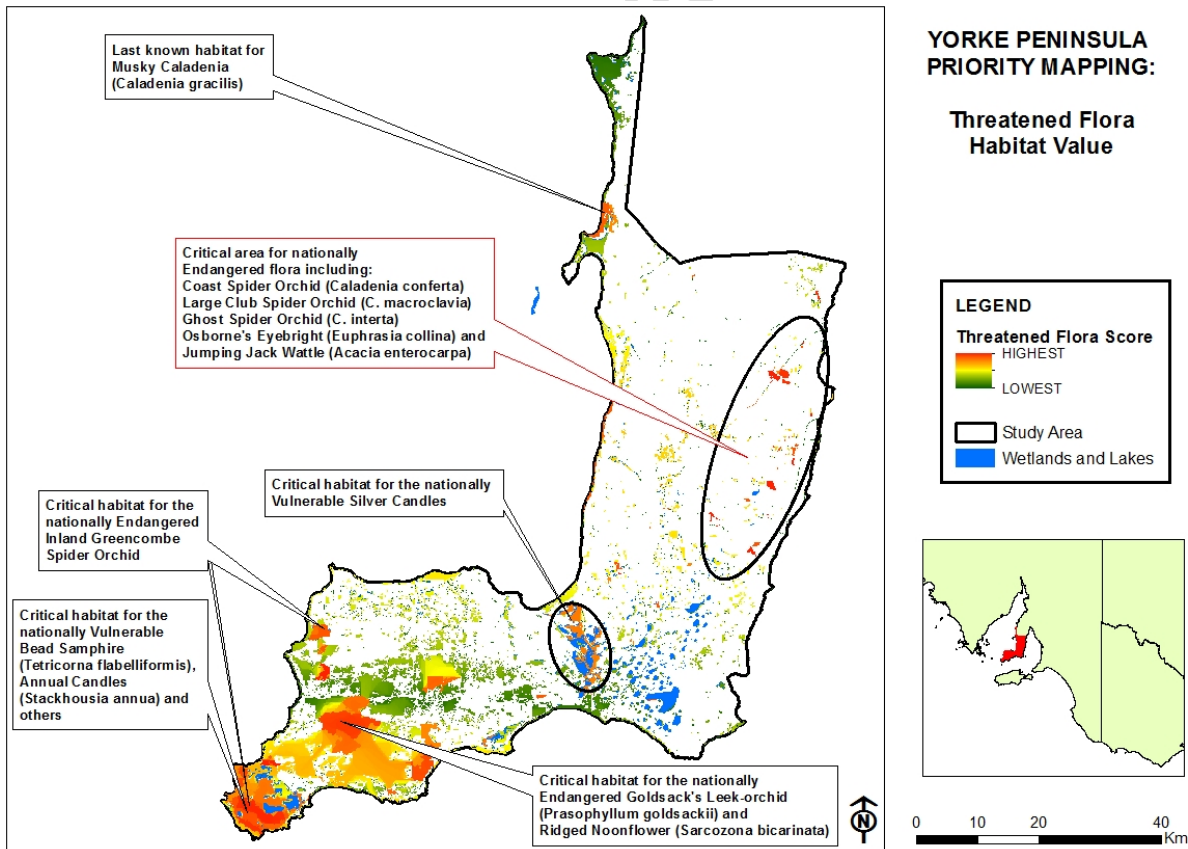
Strategy: Coordinated, Strategic Management of Nationally Threatened Flora Sites

Priority: NOT ASSESSED

- Action steps:**
1. Collate existing baseline information on threatened plant species and sites (including threatening processes)
 2. Survey other potential areas for new threatened plant sites (recording both presence and absence)
 3. Engage land managers of threatened plant sites to understand attitudes to conservation. Raise awareness of threatened plant conservation through the provision of community resource materials (e.g. booklets, fact sheets)
 4. Identify, link and strengthen communication between all existing threatened plant projects and groups
 5. Research management options and mechanisms for enhancing threatened plant populations including commonly used actions (weed / feral animal control, fencing), long term protection of lands (H.A., parks, stewardship) and other techniques such as fire, seed collection, replanting buffers and research on genetics
 6. Develop a threatened flora strategic management plan for Southern Yorke Peninsula including site prioritisation, recommended management actions, delivery mechanisms and budget.
 7. Provide appropriate financial and physical support to community groups, NGOs, state agencies, councils, landholders and contractors to undertake strategic works on priority sites
 8. Support Yorke Peninsula Council to implement actions for threatened plant conservation on roadsides and in reserves (e.g. through staff education, roadside marker system, education workshops, roadside vegetation management plans)
 9. Ongoing monitoring and evaluation of threatened plant populations. Adapt management actions as required

Relevant Report: Koch, P.J. (2013) *Southern Yorke Peninsula Spatial Prioritisation: Mapping Priorities for Habitat Management and Restoration*. Summary report. Unpublished Report, Greening Australia.

Mapping: Refer to Map 14.



6 Conservation Strategies and Actions

Objective: By 2020, re-establish 950 hectares of suitable habitat on Wardang Island, representative of pre-European vegetation communities, to support the recolonisation and reintroduction of terrestrial birds and small mammals.

Strategy:

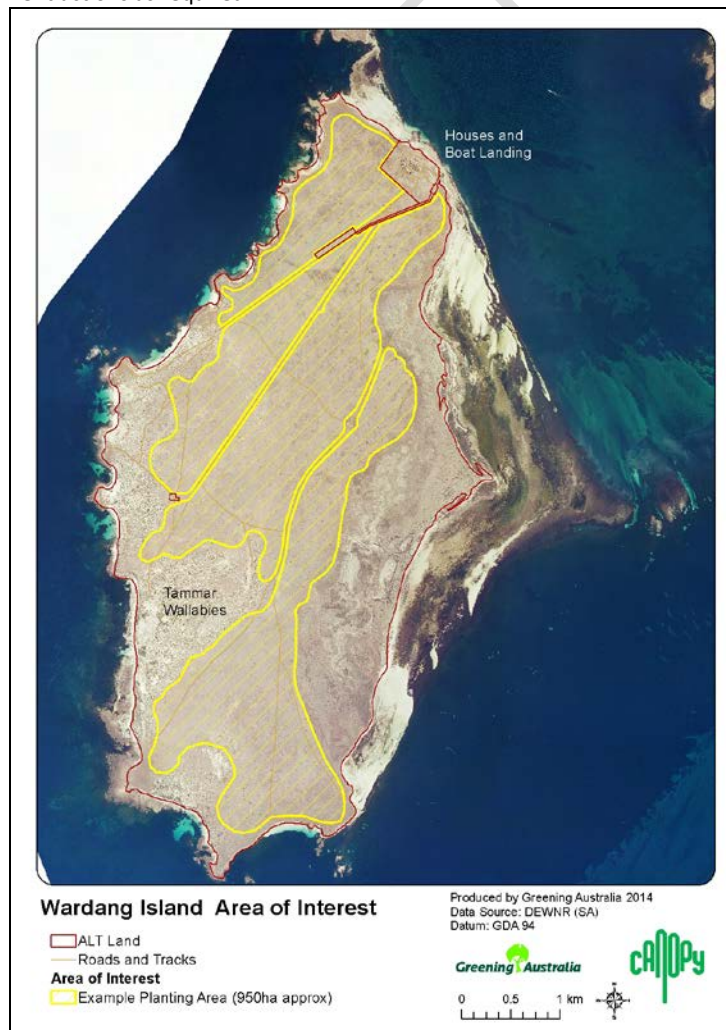
Revegetation and Regeneration of Habitat on Wardang Island

Priority:

NOT ASSESSED

Action steps:

1. Engage Point Pearce Aboriginal community to discuss their interest in revegetation on Wardang Island and how it may link in with the Indigenous Protected Area process
2. Identify pre-European vegetation communities and fauna species on Wardang Island (e.g. from sub-fossil records, historical accounts, soil mapping, pre-European vegetation mapping)
3. Assess current level of pest plants and animals on the island and extent of control required before revegetation program. Identify options for regeneration (rather than revegetation) of native vegetation through feral herbivore exclosures, fire trials and other techniques
4. Develop a 'Staged Revegetation / Regeneration Plan for Wardang Island' over XX years that identifies the vegetation types and structure required to support desired fauna species. Ensure revegetation plan is linked to an 'Integrated Pest Plant and Animal Control Plan for Wardang Island'.
5. Undertake integrated pest animal control (rabbits, mice, cats, rats) program before commencing revegetation / regeneration program. Investigate options for aerial baiting.
6. Increase local skills and capacity for seed collection, seedbank management and establishment of infrastructure to support revegetation activities (e.g. access to island - jetty, native plant nursery, direct seeder)
7. Develop and implement a business plan (linked to IPA, aspiration of Pt Pearce Community, Carbon Farming Initiative, eco-tourism and 'Island Rescue') to source funding for large-scale revegetation / regeneration and to maintain key works over the long term
8. Implement large-scale on-ground revegetation and regeneration on Wardang Island through employment of Point Pearce community and engagement of commercial contractors
9. Ongoing monitoring and evaluation to determine success of revegetation / regeneration activities. Adapt management actions as required



Map 15: Potential Area for Revegetation on Wardang Island (from Cohen and Durant 2014 unpub. Report)

6 Conservation Strategies and Actions

Objective: *By 2015, ensure new developments and associated clearance (e.g. for roads, residential, marinas, mines, wind farms) are restricted to environmentally appropriate designs and locations and no further developments in regionally significant ecological areas.*

Strategy: Sustainable Development

Priority: NOT ASSESSED

Action steps:

1. Review Development Act and understand local and state processes for planning approvals. Identify areas requiring changes to achieve stronger environmental protection.
2. Identify and map highly sensitive ecological areas for no further development, and other areas considered suitable for different levels of development (e.g. around current population nodes)
3. Secure permanent protection for highly sensitive ecological areas not suitable for development (land purchase, permanent covenant, reserve)
4. Identify appropriate guidelines for development in suitable areas (locations, set back limits, minimum size, landscaping, types of development)
5. Provide detailed information to planning approval decision makers (e.g. local / state government) re proposed no-go development zones and other areas considered suitable for development and appropriate guidelines (setback limits, minimum size, etc)
6. Lobby for changes to the Development Act to improve environmental protection including early notification and intervention of the Native Vegetation Council (i.e. similar to Coast Protection Board). Lobby for changes to Native Vegetation Act re clearance on property boundaries.
7. Identify threatened flora on council roadsides and provide training and signage for road construction workers on key locations and suitable practices.
8. Community education and awareness re ecologically sensitive areas on Southern Yorke Peninsula and appropriate guidelines for future and current developments
9. Ongoing monitoring and evaluation of program. Adjust strategy as required.

Objective: *By 2020, identify and implement actions to mitigate the impacts of Climate Change on vulnerable conservation assets, particularly coastal ecosystems, inland wetlands and wombat populations.*

Strategy: Climate Change and Sea Level Rise Mitigation

Priority: NOT ASSESSED

Action steps:

1. Collate existing climate change reports, plans and modelling relevant to the Yorke Peninsula (e.g. Central Local Govt climate change report) and identify baseline and historical climate monitoring information
2. Identify potential climatic impacts (e.g. reduced rainfall, higher temperatures, increase fire, increased sea-level) and vulnerable conservation assets and locations on Yorke Peninsula
3. Identify key actions to build resilience of vulnerable conservation assets to the potential impacts of climate change (e.g. buffer coastal and highly fragmented ecosystems)
4. Investigate potential opportunities (or positive upside) to future climatic impacts / sea level rise (e.g. inundation of Peesey Swamps to improve wader / shorebird habitat)
5. Based on an understanding of predicted climatic changes and impacts on Yorke Peninsula, develop a 'Building Resilience of Vulnerable Conservation Assets in Response to Climate Change Plan'
6. Refine CAP goals and key actions for conservation assets based on the 'Building Resilience of Vulnerable Conservation Assets in Response to Climate Change Plan'
7. Ongoing monitoring and evaluation of climatic changes and impacts (climate stations, sea level monitoring, monitoring of biodiversity assets) and adjust plans and actions as required

7. Monitoring and Evaluation

7.1. Method for Developing a Monitoring Program

The final step in the conservation action planning process is the development and on-going implementation of a rigorous monitoring, evaluation and adaptive management program. This serves a number of important functions:

- determining whether the strategies and actions are achieving the conservation objectives and identifying areas for improvement;
- showing trends in the condition of conservation assets and the levels of threat;
- demonstrating the effectiveness and efficiency of investment into the conservation program;
- linking local conservation outcomes with other programs to describe the local-global biodiversity outlook

In particular two types of monitoring and evaluation are identified in the conservation action planning framework: 1) strategy effectiveness, and 2) resource condition (i.e. asset condition and / or level of threat).

Appropriate Level of Resourcing for Monitoring and Evaluation

Many researchers and conservation practitioners agree that a monitoring effort of 10-20% of the total program budget is an appropriate level of resourcing. However the level of resources allocated to monitoring should vary in proportion to the level of uncertainty surrounding an assumption that action A will lead to the conservation goal B. Higher levels of uncertainty may necessitate greater monitoring effort (i.e. replicated experiments and trials) to test a particular conservation theory.

Use of Results chains

Results chains are a relatively recent tool to assist conservation planners test assumptions that an action will achieve a desired objective. Results chains are broadly based on principles of logical framework analysis and are supported by Miradi software (www.miradi.org). By identifying interim results or milestones along a trajectory towards the delivery of an outcome, results chains make implicit assumptions about the expected results of activities explicit. This process typically results in more rigorous strategy development by the project team. Once a sequence of outputs and outcomes are represented as a results chain diagram, it is relatively easy to visualise and identify monitoring indicators and milestones along the way to a conservation goal.

7.2. Monitoring Indicators for the Southern Yorke Peninsula

An effective monitoring program for the Southern Yorke Peninsula should achieve two major outcomes:

1) RESOURCE CONDITION MONITORING

- provide quantitative data to confirm or revise the **current status** of the key ecological attributes and overall viability of the conservation assets & / or the current status of the key threats;
- establish baseline data to monitor **future changes** in the status of the key ecological attributes and overall viability of the conservation assets &/ or status of the key threats;

2) STRATEGY EFFECTIVENESS MONITORING

- provide quantitative data to assess the effectiveness of the conservation strategies and action steps and identify areas for refinement.

Monitoring indicators should be closely associated to the status of the key ecological attributes of the conservation assets and address landscape context, condition and size attributes (refer Table 7). A monitoring program should also make use of any existing data and monitoring activities in the region so as to ensure resources are used efficiently. This may involve creating links with other organisations that may have complimentary aims or legislative requirements to undertake environmental monitoring. For additional detail regarding historical monitoring programs in the region refer to *Overview of Biodiversity Monitoring in the Northern & Yorke NRM Region (Milne & McGregor 2011)*. For an example of a detailed monitoring plan for a sub-region of the CAP region, refer to the *South-western Yorke Peninsula Biodiversity Monitoring Plan (Nature Conservation Society of SA 2013)*.

7. Monitoring and Evaluation

Table 7: Monitoring Indicators for Key Ecological Attributes (KEA) of the Conservation Assets

Conservation Asset	LANDSCAPE CONTEXT KEA				CONDITION KEA			SIZE KEA
	Dune Formation / Tidal Deposition	Hydro-logical Regimes	Connectivity	Patch Size, shape & Configuration	Water Quality	Flora Species / Habitat Condition	Fauna Species	Total area
High Energy Coastal Dunes	1. Barriers to natural dune formation processes 2. Presence of excessive erosion (dune blow outs)		Percentage of coast buffered by adequate vegetation buffers			Flora Species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (Hooded Plovers, Shorebirds)	Total hectares remaining (% of pre-European cover)
High Energy Coastal Cliffs			Percentage of coast buffered by adequate vegetation buffers			Flora species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (Ospreys, W.B Sea Eagles)	Total hectares remaining (% of pre-European cover)
Low Energy Sheltered Coastlines	Diversity / mosaic of appropriate coastal habitats (sand spits, mud / sand flats)		Percentage of coast buffered by adequate vegetation buffers		Levels of pollutants and nutrients at key storm water run-off areas	Flora species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (Hooded Plovers, Shorebirds)	Total hectares remaining (% of pre-European cover)
Off-shore islands						Flora species diversity & composition (BCM sites, weeds)	Trends in 'habitat / threat sensitive' fauna (shorebirds, seabirds, small mammals)	Total hectares remaining (% of pre-European cover)
Inland Wetlands		1. Flooding regime (frequency, volume, timing) 2. Groundwater depth & levels of recharge	Percentage of wetlands buffered by adequate vegetation buffers		Percentage of wetlands within expected salinity, pH and nutrient range	Flora species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (water birds, waders, invertebrates, frogs)	Total hectares remaining (% of pre-European cover)
Sub-coastal Mallee				Average patch size, shape configuration and distance apart to other patches		Flora species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (Mallee Fowl, Tammar Wallabies, Western Whipbird)	Total hectares remaining (% of pre-European cover)
Relictual Mallee				Average patch size, shape configuration and distance apart to other patches		Flora species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (declining bird species)	Total hectares remaining (% of pre-European cover)
Open Woodlands				Average patch size, shape configuration and distance apart to other patches		Flora species diversity & composition (BCM sites)	Trends in 'habitat / threat sensitive' fauna (declining bird species)	Total hectares remaining (% of pre-European cover)
Southern Hairy-nosed Wombats			Genetic diversity and connectedness of colonies			Habitat availability - presence of native grasses, soil type	Number of young, male - male ratio, age classes. % of population with mange	Number of individuals, colonies & average size of colonies
Small Mammals						Habitat availability – condition and connectedness	Species population numbers, distribution & overall health	% of small mammal species remaining

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Appendix 1: Flora Species of State and National Conservation Significance (Source: DEWNR Spatial Database)

SPECIES	COMMON NAME	CONSERVATION STATUS*	
		AUS	SA
<i>Acacia dodonaeifolia</i>	Hop-bush Wattle		R
<i>Acacia enterocarpa</i>	Jumping-jack Wattle	EN	E
<i>Acacia lineata</i>	Streaked Wattle		R
<i>Acacia rheticarpa</i>	Resin Wattle	VU	V
<i>Adiantum capillus-veneris</i>	Dainty Maiden-hair		V
<i>Asplenium trichomanes</i>	Common Spleenwort		R
<i>Atriplex australasica</i>			R
<i>Austrostipa echinata</i>	Spiny Spear-grass		R
<i>Austrostipa gibbosa</i>	Swollen Spear-grass		R
<i>Austrostipa multispiculis</i>			R
<i>Austrostipa nullanulla</i>	Club Spear-grass		V
<i>Austrostipa pilata</i>	Prickly Spear-grass		V
<i>Billardiera</i> sp. Yorke Peninsula (P.C.Heyligers 80164)	Lehmann's Apple-berry		E
<i>Bothriochloa macra</i>	Red-leg Grass		R
<i>Caladenia bicalliata</i> ssp. <i>bicalliata</i>	Western Daddy-long-legs		R
<i>Caladenia brumalis</i>	Winter Spider-orchid	VU	V
<i>Caladenia conferta</i>	Coast Spider-orchid	EN	E
<i>Caladenia flaccida</i>	Drooping Spider-orchid		V
<i>Caladenia intuta</i>	Ghost Spider Orchid	CR	E
<i>Caladenia macroclavia</i>	Large-club Spider-orchid	EN	E
<i>Caladenia sanguinea</i>	Crimson Daddy-long-legs		R
<i>Caladenia tensa</i>	Inland Green-comb Spider-orchid	EN	
<i>Centrolepis cephaloformis</i> ssp. <i>cephaloformis</i>	Cushion Centrolepis		R
<i>Centrolepis glabra</i>	Smooth Centrolepis		R
<i>Choretrum glomeratum</i> var. <i>chrysanthum</i>	Yellow-flower Sour-bush		R
<i>Corybas expansus</i>	Dune Helmet-orchid		V
<i>Corybas unguiculatus</i>	Small Helmet-orchid		R
<i>Crassula exserta</i>	Large-fruit Crassula		R
<i>Daviesia benthamii</i> ssp. <i>humilis</i>	Mallee Bitter-pea		R
<i>Daviesia sejugata</i>	Disjunct Bitter-pea		E
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	EN	E
<i>Haegiela tatei</i>	Small Nut-heads		R
<i>Hydrocotyle diantha</i>	Kangaroo Island Pennywort		E
<i>Isotoma scapigera</i>	Salt Isotome		R
<i>Lachnagrostis robusta</i>	Tall Blown-grass		R
<i>Leionema microphyllum</i>	Limestone Phebalium		R
<i>Leptorhynchus elongatus</i>	Lanky Buttons		R
<i>Leptorhynchus scaber</i>	Annual Buttons		R
<i>Leptorhynchus tenuifolius</i>	Wiry Buttons		R

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SPECIES	COMMON NAME	AUS	SA
<i>Leucopogon clelandii</i>	Cleland's Beard-heath		R
<i>Levenhookia stipitata</i>			R
<i>Maireana rohrlachii</i>	Rohrlach's Bluebush		R
<i>Mentha diemenica</i>	Slender Mint		R
<i>Microlepidium pilosulum</i>	Hairy Shepherd's-purse		R
<i>Myoporum parvifolium</i>	Creeping Boobialla		R
<i>Olearia pannosa ssp. pannosa</i>	Silver Daisy-bush	VU	V
<i>Olearia passerinoides ssp. glutescens</i>	Sticky Daisy-bush		R
<i>Orobanche cernua var. australiana</i>	Australian Broomrape		R
<i>Phebalium glandulosum ssp. glandulosum</i>	Glandular Phebalium		E
<i>Philothea angustifolia ssp. angustifolia</i>	Narrow-leaf Wax-flower		R
<i>Phlegmatospermum eremaeum</i>	Spreading Cress		R
<i>Phyllanthus calycinus</i>	Snowdrop Spurge		R
<i>Pimelea curviflora var. gracilis</i>			R
<i>Pleuropappus phyllocalymmeus</i>	Silver Candles	VU	V
<i>Poa drummondiana</i>	Knotted Poa		R
<i>Poa fax</i>	Scaly Poa		R
<i>Poa meionectes</i>	Fine-leaf Tussock-grass		V
<i>Podolepis jaceoides</i>	Showy Copper-wire Daisy		R
<i>Podolepis muelleri</i>	Button Podolepis		V
<i>Polypogon tenellus</i>			V
<i>Prasophyllum calcicola</i>	Limestone Leek-orchid		V
<i>Prasophyllum constrictum</i>	Tawny Leek-orchid		R
<i>Prasophyllum fecundum</i>	Self-pollinating Leek-orchid		R
<i>Prasophyllum goldsackii</i>	Goldsack's Leek-orchid	EN	E
<i>Prasophyllum occultans</i>	Hidden Leek-orchid		R
<i>Pteris tremula</i>	Tender Brake		R
<i>Ranunculus sessiliflorus var. pilulifer</i>	Annual Buttercup		V
<i>Sarcozona bicarinata</i>	Ridged Noon-flower		V
<i>Senecio macrocarpus</i>	Large-fruit Groundsel	VU	V
<i>Spyridium leucopogon</i>	Silvery Spyridium		R
<i>Stackhousia annua</i>	Annual Candles	VU	V
<i>Tecticornia flabelliformis</i>	Bead Samphire	VU	V
<i>Tecticornia lepidosperma</i>			R
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R
<i>Triglochin minutissima</i>	Tiny Arrowgrass		R
<i>Xanthorrhoea semiplana ssp. tateana</i>	Tate's Grass-tree		R
	Totals	14	75

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Appendix 2: Fauna Species of State and National Conservation Significance (Source: DEWNR Spatial Database)

SPECIES	COMMON NAME	AUS	SA
<i>Cladorhynchus leucocephalus</i>	Banded Stilt		V
<i>Egretta sacra</i>	Eastern Reef Egret		R
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		E
<i>Leipoa ocellata</i>	Malleefowl	VU	V
<i>Morelia spilota</i>	Carpet Python		R
<i>Neophoca cinerea</i>	Australian Sea-lion	VU	V
<i>Pandion cristatus</i>	Eastern Osprey		E
<i>Pedionomus torquatus</i>	Plains-wanderer	VU	E
<i>Psophodes nigrogularis leucogaster</i>	Western Whipbird (Eastern subspecies)	VU	E
<i>Stagonopleura guttata</i>	Diamond Firetail		V
<i>Sternula nereis</i>	Fairy Tern		E
<i>Thinornis rubricollis</i>	Hooded Plover		V
<i>Turnix varius</i>	Painted Button-quail		R
<i>Varanus rosenbergi</i>	Heath Goanna		V
	Totals	4	14

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Appendix 3: Northern and Yorke Natural Resources Management Board Goals

COASTAL, ESTUARINE AND MARINE ECOSYSTEMS
By 2030, there is no reduction in the extent, and a steady improvement in the condition, of coastal, estuarine and marine ecosystems, compared to 2008.
By 2015, there is no decline in the extent or condition of mangrove forests
By 2030, water quality is maintained to meet levels set for aquatic ecosystems in the Environment Protection (Water Quality) Policy.
By 2030, a 10% reduction in the pollutant load of discharges from licensed point source pollution sites.
By 2015, a 50% reduction in the pollutant load of sewage and stormwater discharged into the marine environment
By 2015, Stormwater and Flood Mitigation Plans are implemented for regional cities and major towns.
By 2015, local Development Plans incorporate principles to protect water quality, as presented in the Regulations and Policies of the NRM Plan.
By 2030, the extent and diversity of coastal landscapes is maintained and their condition improved compared to 2008.
By 2030, there is no decline in the conservation value of the 35 coastal areas of highest conservation priority.
By 2030, an improvement in the conservation value of an additional 14 areas, currently classed as “priority coastal cells”.
By 2015, the condition of at least 4, out of 14, “priority coastal cells” is improved to high conservation totals.
By 2015, there is no further decline in the conservation value of the remaining coastal areas.
By 2015, there is an overall reduction in the threats to coastal ecosystems and landscapes from vegetation clearance, weeds and uncontrolled access by stock, vehicles and pedestrians
By 2015, coastal management guidelines are adopted for vegetation management and public access
By 2015, local Development Plans incorporate principles to protect coast, as presented in the Regs & Policies of the NRM Plan.
WATER AND FRESHWATER ECOSYSTEMS
By 2030, the amount of surface and groundwater available is maintained within the bounds of historical variations and does not deviate significantly from seasonal climatic drivers.
By 2030, fluctuations in groundwater levels, pressures and seasonal spring and baseflows will be maintained within the limits previously observed in the region, for comparable climatic conditions.
By 2030, flow regimes in priority river catchments do not deviate significantly from previously observed seasonal and inter-annual variations for comparable climatic conditions.
By 2015, a revised Water Allocation Plan, compliant with National Water Initiative guidelines, is in place for the Clare region.
By 2015, the Baroota area has an approved Water Allocation Plan in place.
By 2015, the management of water resources is regulated by a series of defined Water Affecting Activities.
By 2030, water quality is maintained, within climatic limitations and natural conditions, within levels set for aquatic ecosystems in the Environment Protection (Water Quality) Policy.
By 2030, mean nutrient levels in watercourses are maintained below Environment Protection Policy (Water Quality) guidelines for aquatic ecosystems.
By 2030, fluctuations in salinity levels in surface water and groundwaters exhibit trends that reflect climatic and seasonal influence and do not exceed levels recorded prior to 2008.
By 2015, Stormwater and Flood Mitigation Plans are implemented for regional cities and major towns.
By 2015, local Development Plans incorporate principles to protect water quality, as presented in the Regulations and Policies of the NRM Plan.
By 2015, salinity management plans are implemented in high priority catchments.
By 2030, core refuge areas are protected by a 20% reduction in the extent of priority degrading watercourse management issues.
By 2015, the length of watercourses unaffected by priority degrading management issues is increased by 5%, with a focus on protecting core refuge areas.
By 2015, River Management Plans are reviewed for the Light, Wakefield and Broughton Rivers

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TERRESTRIAL ECOSYSTEMS
By 2030, maintain the condition of the region's 1,200,000 ha of remnant native vegetation, and improve the condition of 15% from 2008 levels.
By 2015, increase in the area of remnant vegetation protected under legal and voluntary conservation agreements from 75,000 ha to 85,000 ha, with priority given to high conservation value remnants
By 2015, undertake active management on 100,000 ha of the region's remnant vegetation to improve condition compared with 2008.
By 2015, sustainable grazing guidelines have been developed with industry for native pastures to ensure grassy ecosystems are not degraded and to facilitate their recovery
By 2030, there has been no loss of ecologically significant species or communities, and the viability and conservation status of these species has been improved from 2008 levels.
By 2015, the status of Nationally, State and regionally listed species and ecological communities is maintained or improved from 2008 levels.
By 2015, threatened species protection plans will be developed and implemented for threatened species of local priority.
By 2030, there is an increase in ecological connectivity within and between landscapes from 2008.
By 2015, the ecological connectivity of at least three priority landscapes (Flinders-Olary, Tothill Ranges, Southern Yorke Peninsula) is increased, compared to 2008.
By 2015, increase the area of native vegetation by 5,000 ha, with a focus on increasing the functionality of remnant vegetation and the protection of erosion prone areas such as coastal dunes.
By 2015, management plans are implemented for areas of Category A and B roadside vegetation significance
By 2030, inland and estuarine water-dependent ecosystems are maintained or improved in condition from 2008 levels.
By 2015, the condition of at least 600 ha of water dependent ecosystems is improved compared to 2008.
By 2015, the extent of watercourse, wetland and other water dependent ecosystems does not decline from 2008 levels.
By 2015, at least 25% of areas classified as "important riverine habitat" are protected and actively managed.
By 2015, at least 25% of areas classified as "good native watercourse vegetation" are protected and actively managed.
By 2015, Water Allocation Plans provide water to meet the needs of the environment.
PEST PLANTS AND ANIMALS
By 2030, there is a net reduction in the impact caused by pest plants and animals on the environment, primary production and the community.
By 2030, the distribution and abundance of introduced pest plants has not increased compared with 2008.
By 2030, the distribution and abundance of pest animals has not increased compared with 2008.
By 2015, pest risk assessment and management plans are operational for priority pest plants and animals
By 2015, 50% of priority areas are managed to control feral animals.
By 2015, 90% of roadsides are managed with effective weed control programs
By 2030, no new significant introduced pest species have become established.
By 2015, biosecurity and incursion response plans are operational for priority pest plants and animals.

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Appendix 4: Participants of the Southern Yorke Peninsula CAP process 2011 - 2015

Member	Organisation	Position / Role / Expertise
David Sloper	DEWNR	Natural Resource Management Officer
David Pearce	DEWNR	Yorke Peninsula Regional Manager
Jennifer Munro	DEWNR	Water Officer
Robert Lincoln	DEWNR	Animal and Plant Control Team Leader
Andy Sharp	DEWNR	Conservation Programs Manager
Jean Turner	DEWNR	Regional Ecologist
Ian Falkenberg	DEWNR	Program Manager, District Ranger
Caroline Paterson	DEWNR	(former) District Ranger – Yorke
Justin Holmes	DEWNR	District Ranger – Yorke
Peter Copley	DEWNR	Threatened Species & Communities
Deborah Furbank	DEWNR	Community Liaison Officer
Dan Rogers	DEWNR	Ecologist
Adrian Brown	DEWNR	Coastal Management
Jasmine Swales	DEWNR	Ranger - Innes National Park
Van Teubner	DEWNR	Tammar Wallabies, Feral Animal Control
Hannah Short	DEWNR	Feral Animal and Plant Control
Deb Agnew	DEWNR	Community Engagement & Planning
Paul O'Leary	DEWNR	Yorke Peninsula Regional Manager
Max Barr	DEWNR	Project Officer
Stephen Goldsworthy	Council of Yorke Peninsula	Council Reserves, Roadside Management
Michael Richards	Ag Excellence Alliance	Landcare Officer
Dr Sophie Petit	University of SA	Environment Course Coordinator
Chris Rains	Aboriginal Lands Trust	Indigenous Communities and Landcare
Roger Rigney	Aboriginal Lands Trust	Indigenous Communities and Landcare
Bev Coomes	Aboriginal Lands Trust	Indigenous Communities and Landcare
Cherie Beech	Narungga Investment Company	Point Pearce Aboriginal Community
Peter Stockings	Point Pearce Aboriginal Corporation	Landholder and Point Pearce rep
Cath & Malcom Houston	Native Orchid Society of SA	Native Orchids, Flora Knowledge
Kent Treloar	Local Landholder	Bird Surveys, Farming, Local Knowledge
Neil Smith	Local Landholder, YP NRM Group	Farming, Local Environmental Knowledge
Ian Brown	Local Landholder	Farming, Local Environmental Knowledge
Ann Williams	Local Landholder	Local Environmental Knowledge
Grantley Dodd	Local Landholder, YP NRM Group	Local Knowledge
Todd Berkinshaw	Greening Australia	Conservation Planner
Dr Paul Koch	Greening Australia	Conservation Planner, Ecologist
Mick Durant	Greening Australia	Senior Vegetation Consultant
Dr David Taggart	University of Adelaide	Senior Research Fellow
John Pitt	Rural Solutions SA	Principle Consultant
Stuart Collard	Nature Conservation Society of SA	Biodiversity, monitoring
Peter Mahoney	Nature Conservation Society of SA	Biodiversity, monitoring

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Appendix 5: Biodiversity Conservation Projects on Southern Yorke Peninsula as at June 2012

Project	Organisations	Notes
Community and Local Government		
Introduced Tree Project at Minlaton	Southern Yorke Peninsula Landcare Group, District Council of Yorke Peninsula	Community group undertaking exotic tree control (eg. Aleppo Pine)
Mulbura Park Reserve near Port Vincent	National Trust of SA	Private conservation reserve with significant flora species
Hardwicke Bay Coastal Dunes	Prince Alfred College (camp at Point Turton)	Prince Alfred College working with community groups to develop a management plan for Hardwicke Bay
Revegetation at Pine Point	Conservation of Our Threatened Species (COOTS)	Associated with (<i>Acacia rhotinocarpa</i>) conservation
Community Group Weed Control (Acacia cyclops, Polygala, Diosma, Boxthorn & Aleppo Pine)	Foul Bay Area Progress Association, South Coast Road Environmental Group DEWNR	Introduced plant removal to enhance local biodiversity Community Coastcare Grants
Code of the Coast Signage - Visitor Information and Conduct	District Council of Yorke Peninsula	Central Local Government Coastcare Grants
Management of Coastal Camp Reserves - Recreational Strategy	District Council of Yorke Peninsula	Central Local Government Coastcare Grants
Bird Hide at Coobowie Inlet	District Council of Yorke Peninsula, Coobowie Progress Association	Community Coastcare Grants
Marion Bay Viewing Platform and Access Control	District Council of Yorke Peninsula, Marion Bay Township Committee	Community Coastcare Grants
Hooded Plover Signage	District Council of Yorke Peninsula, Birds Australia, DEWNR	Community Coastcare Grants
Daly Heads Access Control, Signage & Weed Control	District Council of Yorke Peninsula, West of the Peesey Biodiversity Group, DEWNR	NRM Grants
Pt. Turton Revegetation for Coastal Erosion & Access Control.	District Council of Yorke Peninsula	NRM Grants
Volunteers within National Parks	Friends of Parks DEWNR	Includes works in Innes National Park, Troubridge and Althorpe Islands
Department of Environment, Water and Natural Resources (DEWNR)		
Landscape Assessment Framework	DEWNR	Tool for prioritising conservation works – applied to the region by Dan Rogers
Fox Baiting (Baiting for Biodiversity)	DEWNR	Program started in 2008 to support parks by fox baiting on private land.
Pest Plant and Animal Control Program	DEWNR	Authorised Officers (include Boneseed and Bridal Creeper control works)
Mallee Fowl Monitoring, Innes National Park	DEWNR, Volunteers	Part of a national Mallee Fowl volunteer monitoring program
Tammar Wallaby Re-introduction	DEWNR	Re-introduced to Innes National Park

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Fox Baiting Innes National Park	DEWNR	Fox baiting (fortnightly) in Innes National Park for Malleefowl and Tamar Wallaby
Western Whipbird Monitoring	DEWNR	Momentum has slowed on this project.
Yellowish Sedge-skipper Survey Monitoring	DEWNR	-
DEWNR Fire Management	DEWNR	Asset protection & ecological burns
Conservation Parks—Onground Works	DEWNR	Various weed control and survey projects
Coastal Conservation Assessment	DEWNR	Assessment of the Northern & Yorke coast for threats and conservation values
BEST program	DEWNR and volunteers	Biodiversity Blitz including survey work and weed control by volunteers
Community Liaison Project (South-western Yorke Peninsula)	DEWNR	Engagement of landholders and development of community groups
South Western Yorke Peninsula Biodiversity Fund Project 2012-2017	DEWNR	5 year project to control weeds, manage coastal recreational impacts, undertake revegetation on southern Yorke Peninsula
Other		
Point Pearce Indigenous Protected Area (IPA)	Aboriginal Lands Trust, Point Pearce community	Funding for local community to manage land at Point Pearce and Wardang Island
Point Pearce Aboriginal Learning on Country (ALOC)	Aboriginal Lands Trust, Point Pearce community	Training program
Aboriginal Land Management	Aboriginal Lands Trust, Point Pearce community	Various activities including weed control and Southern Hairy-nosed Wombat protection
Lofty Block Threatened Orchid Project	Collaborative project including Native Orchid Society of SA, DEWNR, NRM Boards (AMLR, N&Y), Friends of Spring Gully, Friends of Halbury Parklands	Working on Recovery Plans for 7 nationally threatened orchid species including <i>Caladenia macroclavia</i> and <i>C. intuta</i> on southern Yorke Peninsula
Pygmy Possum Monitoring / Research	University of SA	Research by Topa Petit and students
Student Research (University of SA)	University of SA	Includes research into foxes, introduced rodents, introduced and native bee interactions, pollination and fire, phenology of plant species.
Distribution and Abundance of the Southern Hairy-nosed Wombat on Yorke Peninsula	Adelaide University - David Taggart, Lisa Sparrow, Sue Carthew	Research and support project
Inbreeding and Fertility of Southern Hairy-nosed Wombat on Yorke Peninsula	Adelaide University - David Taggart, Lisa Sparrow, Sue Carthew	Research and support project
Bi-annual Hooded Plover Monitoring Program	Birds Australia	On-going project
White-bellied Sea Eagle and Osprey Research/Monitoring	Birds Australia (by Terry Dennis)	State-wide project
South Australian Museum	South Australian Museum	Various research including groundwater invertebrates and mammal fossils.
Sustainable Agriculture projects	Ag Excellence Alliance	A number of projects including no-till farming, education and pollination.
Private Conservation Reserves	National Trust (Mulbura Park), private landholders, Heritage Agreements	-
Conservation Action Planning	Greening Australia	Workshops and development of a conservation action plan for the region
Trees for Life Biodiversity Fund Revegetation Project (2012-14)	Trees for Life	Revegetation on southern Yorke Peninsula

8. Appendices

Appendix 6: Available CAP Resources and Recent Reports

Product	Format
Southern Yorke Peninsula Conservation Action Plan	Excel File (Nature Conservancy Software)
Southern Yorke Peninsula CAP Summary 2011 - 2015	Adobe pdf document (Word versions also available)
Spatial Cap Tool	.pmf File for viewing in ESRI ArcReader software (free software)
Scoping Reports CAP Scoping Report #1 - <i>Developing Priority Weed Programs for Southern Yorke Peninsula</i> , Report to the Department for Environment Water and Natural Resources and the Yorke Peninsula CAP Working Group. Durant, M. (2013) CAP Scoping Report #2 - <i>Peesey Swamps, Southern Yorke Peninsula</i> , Report to the Northern and Yorke Natural Resources Management Board and the Yorke Peninsula CAP Working Group. Durant, M. (2013) <i>Assessment of the Reintroduction Potential of regionally Extinct Fauna on Southern Yorke Peninsula</i> , Bush Science Services, Report to DEWNR and NYNRMB, D. Taggart 2014.	Adobe pdf documents (Word versions also available)
Priority Mapping Koch, P.J. (2013) <i>Southern Yorke Peninsula Spatial Prioritisation: Mapping Priorities for Habitat Management and Restoration</i> . Summary report. Unpublished Report, Greening Australia.	Adobe pdf document (Word versions and separate maps also available)
Soil and Water CAP <i>Yorke Peninsula Sustainable Soils Conservation Action Planning Summary 2015</i> . Report to the Northern and Yorke Natural Resources Management Board and Department of Environment Water and Natural Resources. Greening Australia. McGregor, J. (2015) <i>Sustainable Water Conservation Action Planning Summary 2014</i> . Report to the Northern and Yorke Natural Resources Management Board and Department of Environment Water and Natural Resources. Greening Australia. McGregor, J. (2014)	Adobe pdf document (Word versions also available)
Landholder Survey <i>Landholder Values and Preferences for Carbon Farming and Native Vegetation Management on Southern Yorke Peninsula</i> , Report to NYNRM Board from University of SA, Raymond C. and Weber D. 2014.	Adobe pdf document (Word versions also available)
Monitoring Overview of Biodiversity Monitoring in the Northern and Yorke Natural Resources Management Region. Report by Greening Australia for Northern and Yorke NRM Board. Milne T. and McGregor J. (2011). <i>Southern Yorke Peninsula Monitoring Plan</i> . Nature Conservation Society of South Australia Inc, Adelaide. Nature Conservation Society of South Australia (2013). <i>Bushland Condition in the Open Woodlands of the Southern Yorke Peninsula of SA – a stratified random condition assessment of 20 sites</i> . Nature Conservation Society of South Australia Inc, Adelaide. Mahoney P. (2013).	Adobe pdf document (Word versions also available)

8 References

BOM 2001: Bureau of Meteorology website www.bom.com.au

Conservation Measures Partnership (2007). Open standards for the practice of conservation. Available online at: www.conserveonline.org.

DEH 2003, *Innes National Park Management Plan*, Department for Environment and Heritage, Adelaide

DENR 2010, Fire Management Plan for the Reserves of the Lower Yorke Peninsula, DENR, Adelaide

Dobson, A.P. (1996). Conservation and Biodiversity. New York: Scientific American Library.

Foundations of Success. (2007). *Using Results Chains to Improve Strategy Effectiveness: An FOS How-To Guide*. http://fosonline.org/Site_Documents/Grouped/FOS_Results_Chain_Guide_2007-05.pdf

Gillam, S. and Urban, R. 2008. Species Risk Assessment Pilot Project: Phase 1 Regional Species Conservation Assessments. Department for Environment and Natural Resources, South Australia

Groves, C.R. (2003). Drafting a Conservation Blueprint: A Practitioners Guide to Planning for Biodiversity. The Nature Conservancy. Island Press, Washington.

Hanski, I. (1991). Single species metapopulation dynamics: concepts, models and observations. In M.E. Gilpin and I. Hanski, eds., *Metapopulation Dynamics: Empirical and Theoretical Investigations*, pp 17-38 New York, NY: Academic Press.

Harris, J. A., Hobbs, R., Biggs, E. and Aronson, J. (2006). Ecological restoration and global climate change. *Restoration Ecology* 14(2): 170-176.

Hill, D.L and Hill, S.J (1975). Notes on the Narangga Tribe of Yorke Peninsula. SA Museum, Lutheran Publishing House, Adelaide

Koch, P.J. (2013) Southern Yorke Peninsula Spatial Prioritisation: Mapping Priorities for Habitat Management and Restoration. Summary report. Unpublished Report, Greening Australia.

Landres, P.B., Morgan, P. and Swanson, F.J. (1999). Overview of the use of natural variability concepts in managing ecological systems. *Ecological Applications* 9: 1179-1188.

Low, (2003). *Landscape-scale Conservation: A Practitioners Guide*. The Nature Conservancy, 4th Edition

Mackey, B.G., Soulé, M.E., Nix, H.A., Recher, H.F., Lesslie, R.G., Williams, J.E., J Woinarski, C. Z.R., Hobbs, J. and Possingham, H.P. (2007) Applying landscape-ecological principles to regional conservation: the WildCountry Project in Australia. *In: Key Topics and Perspectives in Landscape Ecology*. Cambridge University Press. Edited by Jianguo Wu and Richard J. Hobbs.

MacNally, R., Bennett, A.F., Brown, G.W., Lumsden, L.F., Yen, A., Hinkley, S., Lillywhite, P. and Ward, D. (2002). How well to ecosystem-based planning units represent different components of biodiversity? *Ecological Applications* 12: 900-912.

Margules, C.R. and Pressey, R.L. (2000). Systematic conservation planning. *Nature* 405: 243-253.

Mahoney P. (2013), Bushland Condition in the Open Woodlands of the Southern Yorke Peninsula of SA – a stratified random condition assessment of 20 sites. Nature Conservation Society of South Australia Inc, Adelaide..

MERI (2008). Australian Government Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework.

8 References

Moilanen, A., Franco, A. M. A., Early, R., Fox, R., Wintle, B., and C. D. Thomas. 2005. Prioritising multiple-use landscapes for conservation: methods for large multi-species planning problems. *Proceedings of the Royal Society of London, Series B, Biological Sciences* 272: 1885-1891.

Nachlinger, J., Sochi, K., Comer, P., Kittel, G. and Dorfman, D. (2001). *Great Basin: An ecoregional based conservation blueprint*. Arlington VA: The Nature Conservancy.

Nature Conservation Society of South Australia (2013), *South-west Yorke Peninsula Biodiversity Monitoring Plan*. Nature Conservation Society of South Australia Inc, Adelaide.

Noss, R. F.E., Dinerstein, B., Gilbert, M., Gilpin, B.J., Miller, B.J., Terbough, J. and Trmbulak, S. (1999). Core areas: where nature begins. In J. Terbough and M. Soule, eds., *Continental Conservation: Scientific Foundations of Regional Reserve Networks*, pp 99-128. Washington DC: Island Press.

Parkes, D., Newell, G. and Cheal, D. (2003). Assessing the quality of native vegetation: The 'habitat hectares' approach. *Ecological Restoration and Management*. 4: 29-38.

Poiani, K.A., Baumgartner, J.V., Buttrick, S.L., Green, S.C., Hopkins, E., Ivey, G.D., Sutton, K.P., and Sutter, R.D. (2000). Biodiversity conservation at multiple scales: functional sites, landscapes and networks. *Bioscience* 50: 133-146.

Possingham, H., Ball, I. and Andelman, S. (2000). Mathematical methods for identifying representative reserve networks. In: S. Ferson and M.A. Burgman, eds. *Quantitative Methods in Conservation Biology*, pp 291-306. New York, NY: Springer-Verlag.

Pressey, R.L. and Nichols, A.O. (1989). Application of a numerical algorithm to the selection of reserves in semi-arid New South Wales. *Biological Conservation* 50: 263-278.

Soulé, M.E., Mackey, B.G., Recher, H.F., Williams, J.E., Woinarski, J.C.Z., Driscoll, D. Dennison, W.C. and Jones, M.E. (2004). The role of connectivity in Australian conservation. *Pacific Conservation Biology* 10: 266-79, Surrey Beatty & Sons, Sydney.

Taggart D. (2014), *Assessment of the Reintroduction Potential of regionally Extinct Fauna on Southern Yorke Peninsula*, Bush Science Services, Report to DEWNR and NYNRMB.

Thomson, J. R., Moilanen, A. J. , Veski, P. A. , Bennett, A. F. , Mac Nally, R. (2009). Where and when to revegetate: a quantitative method for scheduling landscape reconstruction. *Ecological Applications*: Vol. 19, No. 4, pp. 817-828.

Wiens, J.A. (1996). Wildlife in patchy environments: metapopulations, mosaics and management. In: D.R. McCullough, ed., pp. 53-84. Washington DC: Island Press.

Wintle, B.A. (2008) *A Review of Biodiversity Investment Prioritization Tools*. A report to the Biodiversity Expert Working Group toward the development of the *Investment Framework for Environmental Resources*, School of Botany, University of Melbourne

WWF. 2005. *Basic Guidance for Cross-Cutting Tools: Conceptual Models*.

www.panda.org/standards or http://assets.panda.org/downloads/1_4_conceptual_model_11_08_05.pdf