Conservation Action Planning

June 2017 Summary

Upper Yorke Peninsula Subregion

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

Compiled by:
Paul Koch (Greening Australia)
for the Northern and Yorke Natural Resources Management Board
and Department of Environment, Water and Natural Resources

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Government of South Australia
Northern and Yorke Natural Resources Management Board

Greening Australia

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Contents

1. Background

1.1. Introduction

This document summarises the progress of the **Upper Yorke Peninsula** Conservation Action Planning (CAP) process to the 30th June 2017. The Natural Resources Northern and Yorke region was formerly divided into subregions for Conservation Action Planning (biodiversity focus) purposes, comprising the Yorke Peninsula, Mid North and southern Flinders subregions, however following recent (2016) Mid North CAP workshops it was determined that the Upper Yorke Peninsula area was distinct enough in biophysical and socio-political terms to justify its excision from the Mid North subregion. Hence, there are now four subregions for biodiversity action planning purposes. The planning process for the Upper Yorke Peninsula subregion is based largely on desktop assessment, since much of the information about assets, current viability and threats can be derived from existing plans for the Yorke Peninsula and Mid North subregions, however a single day workshop was held on May 31st 2017 to review the outcomes of the desktop assessment, refine strategies and develop priority projects.

1.1.1. Conservation Action Planning (CAP)

The planning process follows the Conservation Action Planning (CAP) framework developed by the US-based conservation group The Nature Conservancy www.nature.org. 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 supporting software (i.e. CAP Excel workbook or Miradi) to guide participants through the development of a 1st iteration landscape conservation plan.

Whilst built on solid scientific principles, the approach recognises that there are often large gaps in ecological knowledge and data sets and hence a strong on-going adaptive management ethic is implied throughout the process, as illustrated in Figure 1. 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.

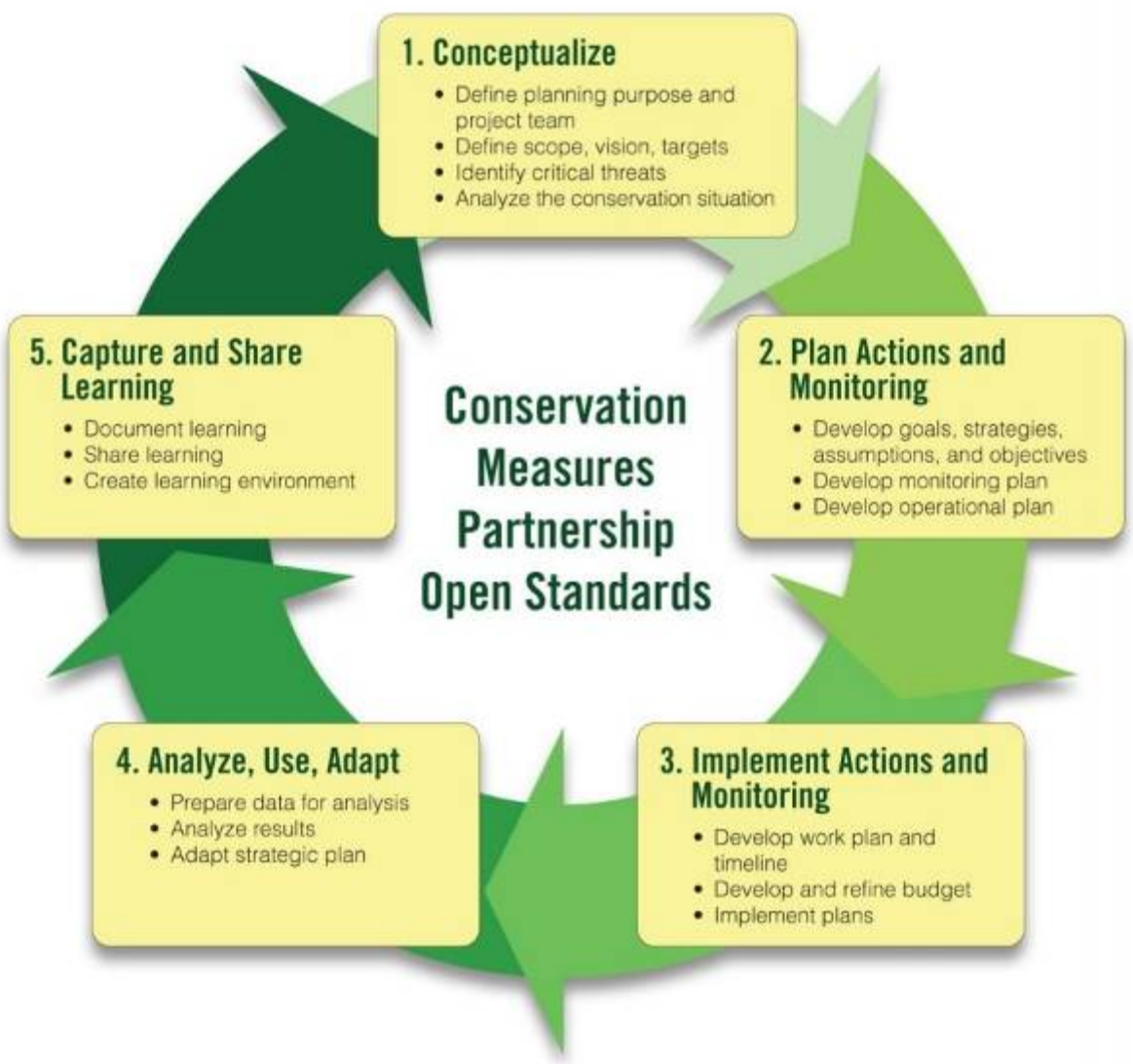


Figure 1. Adaptive management cycle, Open Standards for the Practice of Conservation v3.0.

1.2 Regional Planning Context

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

The Northern and Yorke Natural Resources Management (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 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 four sub-regions based primarily on ecological characteristics (refer Map 1). The four sub-regions are:

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

1.2.2 Existing Biodiversity Conservation Programs and Organisations

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

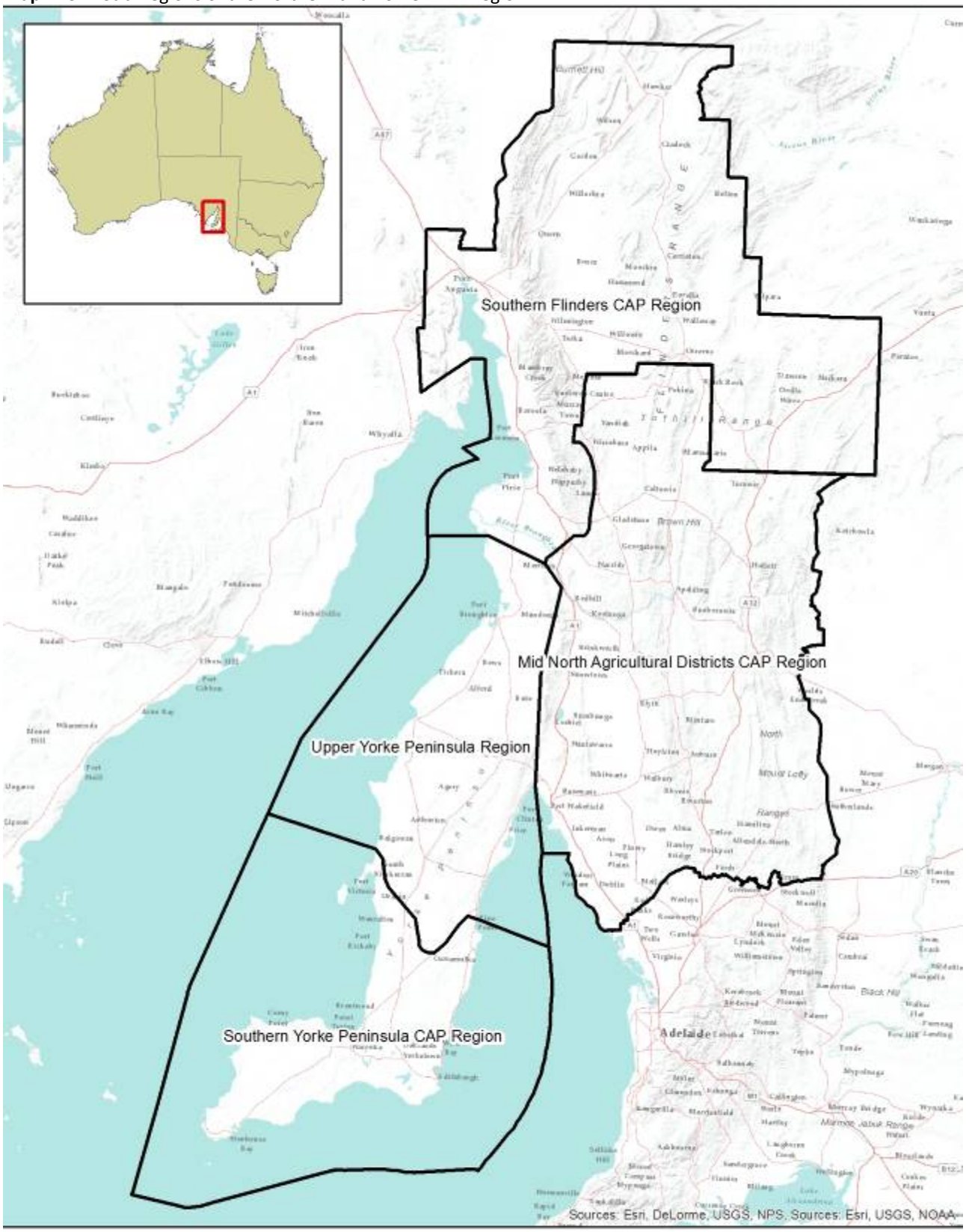
The principle organisations involved in biodiversity conservation in the region are the Northern and Yorke Natural Resources Management Board and the State Government Department of Environment, Water and Natural Resources. These two organisations underwent a merger in 2010/2011 and now function primarily as one organisation.

Other contributors to biodiversity conservation in the region include the 11 District Councils (of the original CAP region boundary), Rural Solutions of South Australia and a number of non-government organisations (Nature Conservation Society of South Australia, Greening Australia, Trees for Life, Threatened Plant Action Group, Ag Excellence Alliance, Native Orchid Society of SA) and local landholder groups (e.g. Mid North Grasslands Working Group).

Table 1: Existing Biodiversity Programs and Legislative Frameworks

National	State (SA)	Regional (N&Y NRM)	National and State Legislation
• 20 Million Trees Program • National Water Initiative • National Strategy for the Conservation of Australia's Biological Diversity • Australian Government Climate Change Policies	• State Strategic Plan • Tackling Climate Change • State Natural Resources Management Plan • No Species Loss	• Northern and Yorke NRM Plan • Northern and Yorke Biodiversity Plan • DEWNR Biodiversity Strategy • Threatened Species Recovery Plans	• 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 (SA)

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



Conservation Action Planning (CAP) Sub-regions of the Northern and Yorke NRM Region

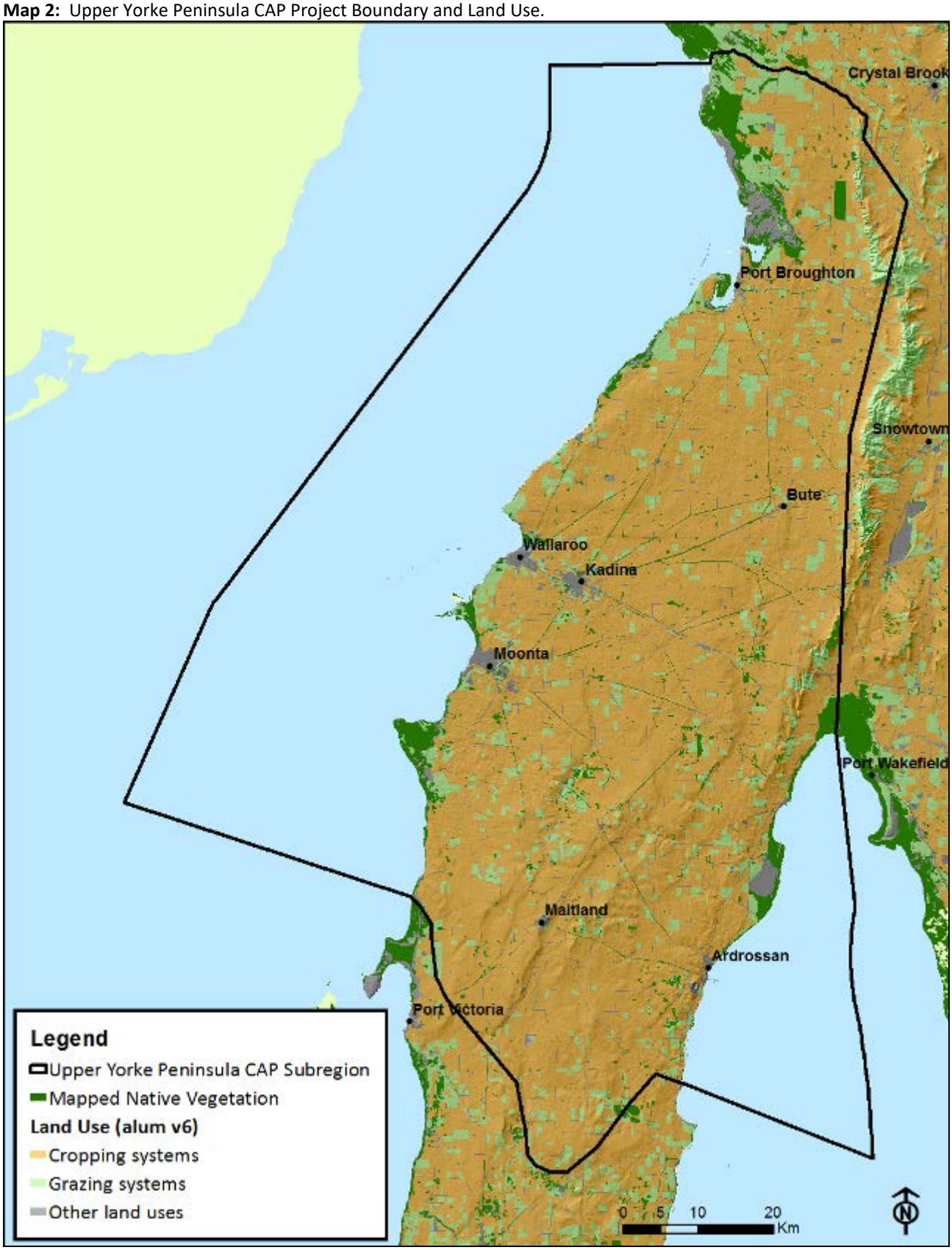
CAP Sub-region Boundary

0 5 10 20 30 40 50
Kilometers

N

Note: All boundaries are considered 'soft'. Planning and project implementation will work across boundaries. Data supplied by the Department for Environment, Water and Natural Resources SA.

Map 2: Upper Yorke Peninsula CAP Project Boundary and Land Use.



1.3.3 Native Vegetation

The coastal strip of the Upper Yorke Peninsula is dominated by large areas of samphire and chenopod vegetation with mangroves (*Avicennia marina*) occurring in sheltered inter-tidal areas. Interspersed with these areas along the coast are low dunes dominated by shrubs such as Coastal Daisy-bush (*Olearia axillaris*) and wattles (*Acacia ligulata, A. cupularis*).

The region is interesting in that it includes elements of temperate (coastal scrubs and open woodlands), semi-arid (chenopod mallee) and arid (chenopod shrublands) ecosystems. Mallee commonly includes tree species such as: Yorrell (*Eucalyptus gracilis*), Gilja (*E. brachycalyx*), Red Mallee (*E. oleosa*) and Beaked Red Mallee (*E. socialis*), while chenopod shrublands are variously dominated by Black Oak (*Casuarina pauper*) or False Sandalwood (*Myoporum platycarpum*), together with Bluebush (*Maireana sedifolia*, *M. pyramidata*), *Eremophila* spp. and *Senna* spp.

The climate is likely to become increasingly arid as climate change progresses and this is predicted to result in considerable changes (up to 50% by 2050; Williams et al. 2014, Guerin 2016, Koch 2016) in plant species composition and a shift in temperate to semi-arid communities and semi-arid to arid communities. In some cases, we may be able to deduce future vegetation communities by looking at vegetation on similar soil types occurring in more arid areas today.

The vegetation of the region is highly fragmented (though linear corridors of vegetation along roadsides provide a disconnected network throughout the region), hence there are substantial dispersal barriers for plants and animals to "migrate" southwards as the climate warms.

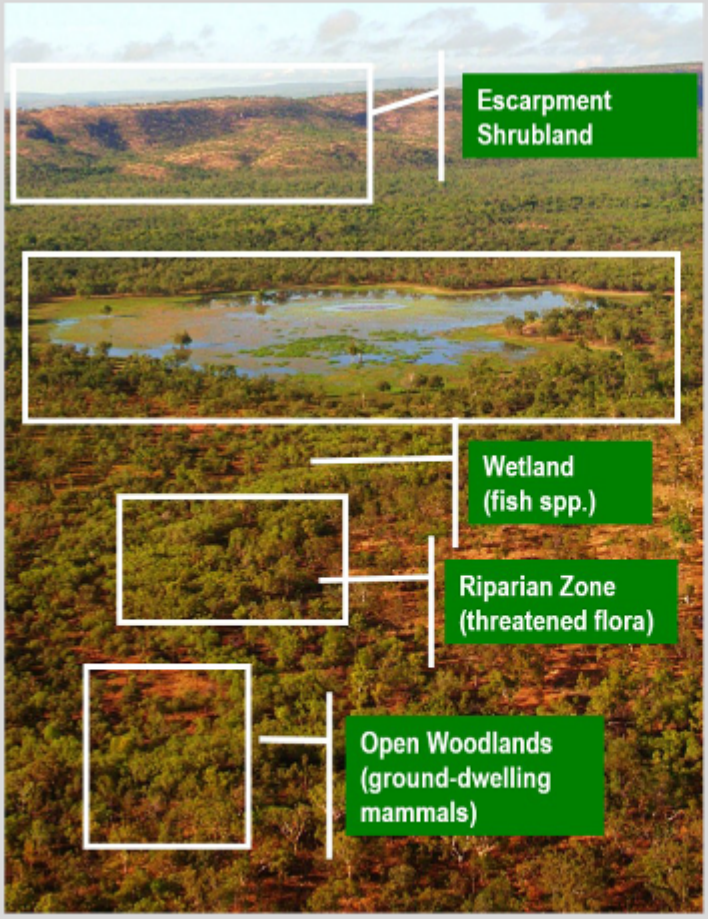
2. Conservation Assets

BOX 1: Asset Identification

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

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

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



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

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

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

2.1. Identification of Conservation Assets

Five focal conservation assets have been identified for the Upper Yorke Peninsula (refer below). Each conservation asset is associated with a number of nested assets (i.e. plant communities, species assemblages and individual species of conservation significance) which help to further define the asset. Map 4 shows the current distribution of assets and Map 5 shows the estimated pre-European extent of different vegetation types.

1. Coastal Mangroves and Samphire
2. Low Coastal Dunes and Cliffs
3. Relictual Mallee & Woodland Communities & Declining Insectivorous Birds
4. Southern Hairy-nosed Wombat
5. Threatened Flora

2.2.1 Coastal Mangroves and Samphire

Coastal mangroves and samphire occur in low energy, inter-tidal areas of the Upper Spencer Gulf and Gulf St Vincent. These areas are considered nationally important bird areas by Bird Life Australia and are listed as wetlands of national significance. Important locations include Point Jarrold and Clinton Conservation Park and near the coastal township of Port Wakefield. Coastal mangroves and samphire provide important habitat for shorebirds, crustaceans, fish breeding and the nationally vulnerable Bead Samphire (*Tecticornia flabelliformis*). N.B. since the 2016 boundary redraw this asset has been significantly reduced from previous extent and is expected to be managed through strategies developed by the Yorke Peninsula CAP.

Nested Assets		AUS	SA
PLANT COMMUNITY	Mangrove (*Avicennia marina*) Low forest		
PLANT COMMUNITY	Samphire and chenopod shrublands		
KEY HABITAT AREAS	Intertidal zone (tidal flats)		
ECOLOGICAL FUNCTION	Important shorebird, fish breeding and nursery area		
SHOREBIRDS, WADERS & SEABIRDS	Fairy Tern (*Sterna nereis*) e.g. Eastern Curlew, Thornbill, Sandpipers		E
BIRDS ASSOCIATED WITH CHENOPOD SHRUBLAND	e.g. Rock Parrot, Elegant Parrot, Blue winged Parrot		
INVERTEBRATES	Crabs, Crustaceans, Molluscs and Bi-valves		
THREATENED FLORA	Bead Samphire (*Tecticornia flabelliformis*).	VU	V
KEY LOCATIONS	Clinton CP, Pt Wakefield & estuary, Pt Jarrold. Important Bird Areas (Birds Australia) & Wetlands of National Significance – Gulf St Vincent		

2.2.2 Low Coastal Dunes and Sandy Beaches

Low coastal dunes, cliffs and sandy beaches occur in narrow linear strips along the Mid North coastline and are dominated by common coastal plants such as Coast Daisy-bush (*Olearia axillaris*) and wattles (*Acacia ligulata, A. cupularis*). Important locations include Cape Elizabeth, Tiddy Widdy Beach, Pine Point and The Dunes. Coastal dunes and sandy beaches provide important habitat for shorebirds and reptiles, and low coastal cliffs provide nesting and roosting habitat for small raptors. On the western coastline, important habitat is provided for the state vulnerable Hooded Plover (*Thinornis rubricollis*).

Nested Assets		AUS	SA
PLANT COMMUNITY	Coastal Dune Shrublands (*Olearia axillaris, Acacia ligulata, A. cupularis*)		
KEY HABITAT AREAS	Sandy beaches, low dunes and intertidal zone (sand flats)		
KEY HABITAT AREAS	Low energy coastal cliffs & rocky shorelines		
KEY HABITAT AREAS	Freshwater soaks in coastal dunes		
THREATENED BIRDS	Hooded Plover (*Thinornis rubricollis*)		V
THREATENED FLORA	Regionally threatened flora (e.g. *Scaevola angustata, Lepidosperma gladiatum, Myoporum parvifolium*)		
BIRD ASSEMBLAGE	Shorebirds and seabirds		
ASSEMBLAGE	Sea Lion Haul Out Areas Marine Turtles		
BIRD ASSEMBLAGE	Small Raptors		
KEY LOCATIONS	Cape Elizabeth		

2.2.3 Relictual Mallee and Arid Shrubland Communities

This asset includes the following 4 vegetation types:

1. **Mallee on sand over clay soils**, typically associated with a Ridge-fruited Mallee *Eucalyptus incrassata* overstorey and a shrubby understorey
2. **Plains mallee communities on calcareous clay soils**, typically associated with a Yorrell *Eucalyptus gracilis*, Red Mallee *E. oleosa* and/or Beaked Red Mallee *E. socialis* overstorey and a a chenopod understorey
3. **Arid shrubland communities on calcareous clay soils** dominated by Black Oak *Casuarina pauper,* False Sandalwood *Myoporum platycarpum* associated with a chenopod understorey
4. **Open woodlands on shallow calcareous loams** dominated by Mallee Box *Eucalyptus porosa*, Drooping Sheoak *Allocasuarina verticillata* and/or Dryland Teatree *Melaleuca lanceolata* with an understorey composed of sedges, grasses and herbs.

These communities have all been extensively cleared for agriculture and most of the extant vegetation occurs on roadsides, railway lines and stock routes. The communities have been lumped together for the purpose of this CAP because management issues are similar.

Nested Assets		AUS	SA
PLANT COMMUNITY	Ridge-fruited Mallee (*Eucalyptus incrassata*) shrubby sand mallee		
PLANT COMMUNITY	Yorrell (*Eucalyptus gracilis*) and Red Mallee (*E. oleosa*) mallee with an open understorey		
PLANT COMMUNITY	Mallee Box (*Eucalyptus porosa*) and Native Pine (*Callitris gracilis*) Mallee Woodland		
MAMMAL ASSEMBLAGE	Bats, Short-beaked Echidna (*Tachyglossus aculeatus*) and Southern Hairy Nosed Wombats (*Lasiorhinus latifrons*)		
BIRD ASSEMBLAGE	Declining Woodland Birds eg. Hooded Robin, Red-capped Robin, Restless Flycatcher, Jacky Winter		
REPTILE ASSEMBLAGE	Sand (Gould's) Goanna		
INVERTEBRATES	Native Bees		
KEY LOCATIONS	Roadsides, Railway lines, Travelling Stock Routes and Cemeteries		

2.2.4 Nationally Threatened Flora

Threatened flora species occurring occurring in relictual mallee areas have been grouped together as an asset since their long term persistence is heavily dependent on active conservation management.

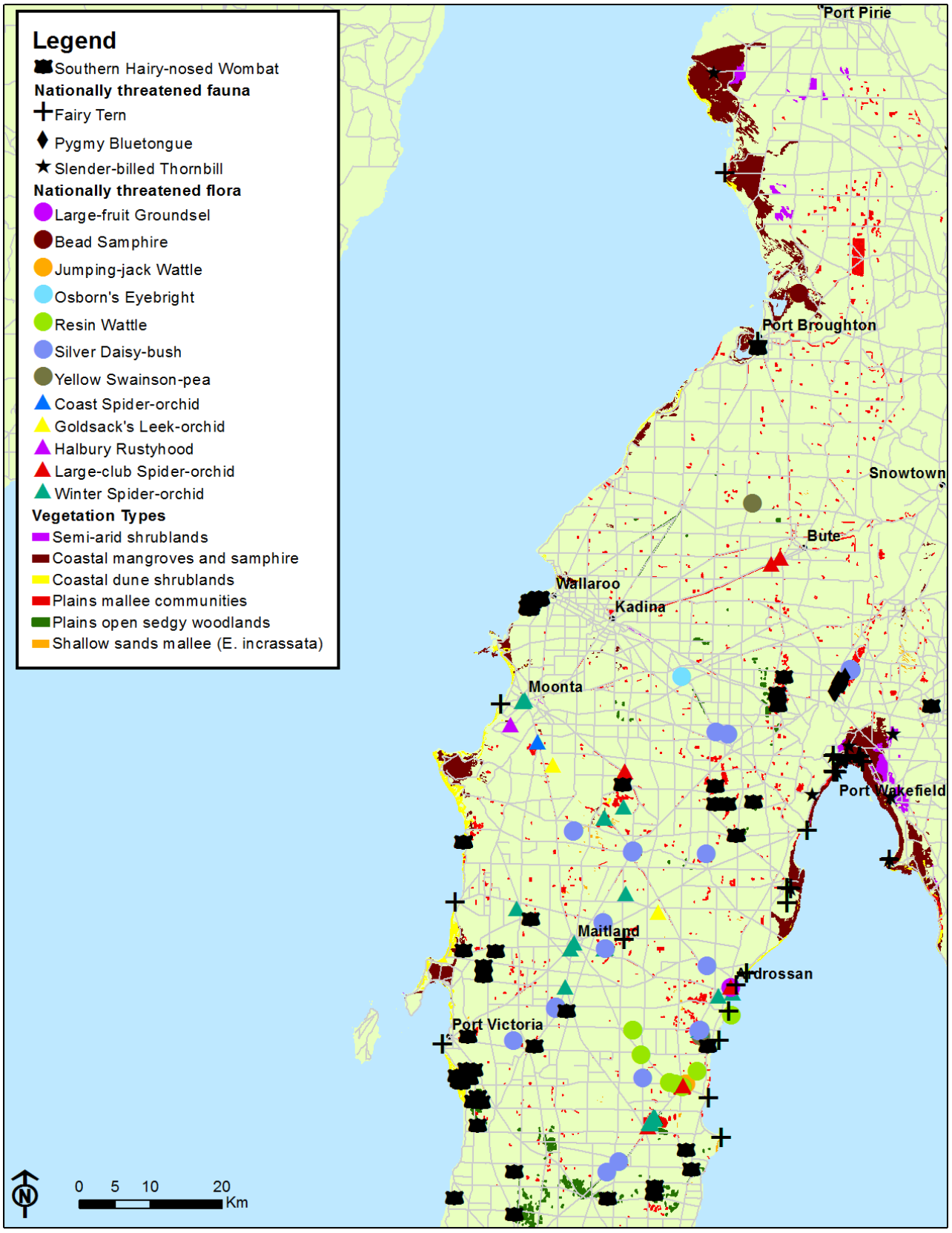
Nested Assets		AUS	SA
Coast Spider-orchid	*Caladenia conferta*	EN	E
Goldsack's Leek-orchid	*Prasophyllum goldsackii*	EN	E
Halbury Rustyhood	*Pterostylis lepida*	EN*	E*
Jumping-jack Wattle	*Acacia enterocarpa*	EN	E
Large-club Spider-orchid	*Caladenia macroclavia*	EN	E
Large-fruit Groundsel	*Senecio macrocarpus*	VU	V
Osborn's Eyebright	*Euphrasia collina ssp. osbornii*	EN	E
Resin Wattle	*Acacia rhetinocarpa*	VU	V
Silver Daisy-bush	*Olearia pannosa ssp. pannosa*	VU	V
Winter Spider-orchid	*Caladenia brumalis*	VU	V
Yellow Swainson-pea	*Swainsona pyrophila*	VU	R
	Dodonaea subglandulifera	EN	E

2.2.5 Southern Hairy-nosed Wombat

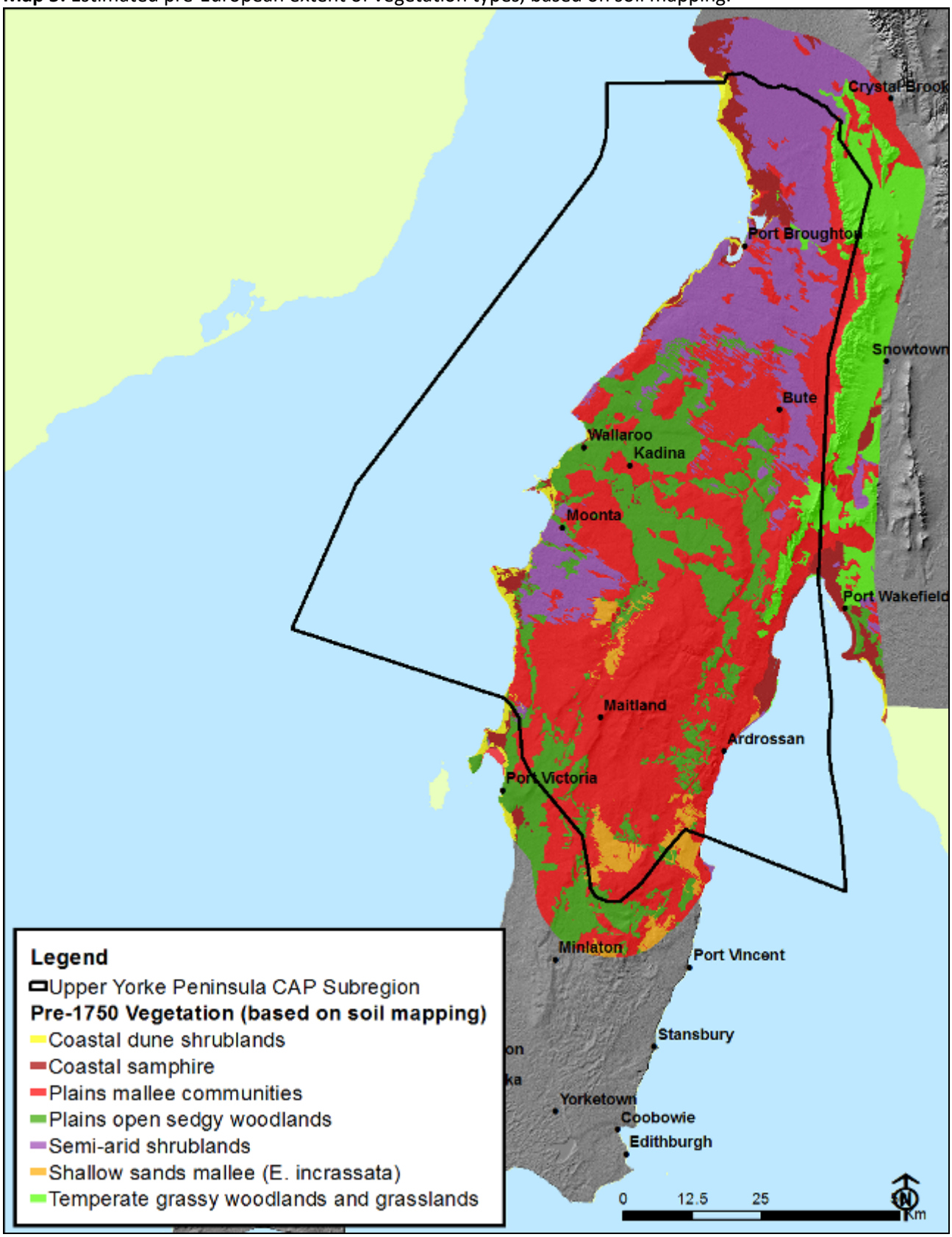
Southern Hairy-nosed Wombat (*Lasiorhinus latifrons*) populations are considered at risk of serious decline on the Yorke Peninsula with only 640 individuals from 24 colonies estimated to remain in 2010 (Taggart & Sparrow 2010). Of the 24 colonies remaining, 21 were estimated to have less than 20 individuals. Significant populations occur across the southern and upper yorke peninsula subregions, hence conservation strategies for wombats are likely to be integrated across these areas.

Wombats are highly interactive with their environment and they perform important soil turn-over functions. As such there is scope for reintroduction and translocations for multiple benefits.

Map 4: Current distribution of vegetation types and threatened species.



Map 5: Estimated pre-European extent of vegetation types, based on soil mapping.



3. Viability Assessment

BOX 2: Viability Assessment

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

"How do we define 'health' (viability) for each of our assets?"

"What is the current status of each of our assets?"

"What is our desired status for each of our assets?"

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

***Asset**: Eucalypt Woodland*
Key Attribute: Fire Regime
Indicator: Percentage of woodland with acceptable fire frequency (10-15 years)

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

Good: 50-75%

Fair: 25-50%

Poor: <25%

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

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

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

Total extent (% of pre-European extent)

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

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

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

3.1 Viability Ranking

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 4). These assessments were supported by existing monitoring data for some key ecological attributes and in other cases were based purely on local expert opinion. The absence of quantitative data for assessing the viability of many key ecological attributes highlights a gap in the existing biodiversity monitoring program and an area for future development (refer section 7).

Table 4 shows that most assets are in poor to fair condition, with coastal mangroves and samphire having multiple attributes in good condition.

Table 4: Current status of Key Ecological Attributes of the Conservation Assets

Asset	Landscape Context	Condition	Size	Overall STATUS
Relictual Mallee and Arid Shrublands	*Patch size and connectivity*	*Vegetation condition*	*% of pre-European area*	**POOR**
		Fauna diversity and composition		
Low Dunes and Cliffs	*Connectivity to adjacent vegetation communities*	*Vegetation condition*	*Total dune area*	**FAIR**
	Connectivity within system	*Fauna diversity and composition*		
Coastal Mangroves and Samphire	*Connectivity to adjacent vegetation communities*	*Plant species and structural diversity*	*Total habitat area*	**FAIR**
	Hydrological regime	*Fauna diversity and composition*		
Threatened Flora	*Minimum connected habitat area*	*Vegetation condition*	*Total population size*	**POOR**
		Reproductive success		
Southern Hairy-nosed Wombat	*Minimum connected habitat area*	*Absence of disease*	*Total population size (within NY region)*	**POOR**
		Reproductive success		

4. Threat Assessment

BOX 3: Threat Ranking

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

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

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

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

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

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

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

4.2. Threat Ranking

The key threats to the conservation assets of the Upper Yorke Peninsula, as assessed by participants in the CAP workshops, are summarised in Table 5. Habitat loss and fragmentation, climate change, sea level rise and environmental weeds were assessed as the highest ranked threats to the conservation assets across the region. The most highly threatened assets were assessed to be **low coastal dunes and cliffs** and **threatened flora**.

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

Threats Across Assets	Coastal Mangroves & Samphire	Low Coastal Dunes and Cliffs	Relictual Mallee and Arid Shrubland Communities	Threatened Flora	Southern Hairy-nosed Wombat	Overall Threat Rank
Habitat loss & fragmentation (from historical clearance)	Low	High	Very High	Very High	Very High	Very High
Climate change (hotter, drier, changing rainfall patterns)	Med	Med	High	Very High	Med	Very High
Sea level rise and storm surge	High	Very High	Low	Low	Med	High
Environmental weeds	Low	Med	High	High	Med	High
Feral carnivores (fox, cat, rats)	Med	High	Med		Low	Med
Loss of adjacent native vegetation	Med	High				Med
Inappropriate stock grazing and access	Low	Med	Med	High	Med	Med
Introduced herbivores and pests (rabbits, deer, goats, mice, snails)		Med	Med	High	Med	Med
Unmanaged recreational access (off-road 4WDs, people, camps)	Med	High	Low	Low	Low	Med
Housing & township expansion (inc industry)	Med	High	Low	Low	Low	Med
Active suppression by landholders (cropping)					High	Med
Adjacent agricultural practices (spray drift, nutrients, run-off, pastures)	Low	Med	Med	Med	Med	Med
Mining (salt, gypsum)	Med	Low			Low	Med
Inappropriate road/rail reserve management			Med	Med	Low	Med
Marina development	Med	Med			Low	Med
Threat Status for Targets and Project	High	Very High	High	Very High	High	Very High

5. Situation Analysis and Strategy Development

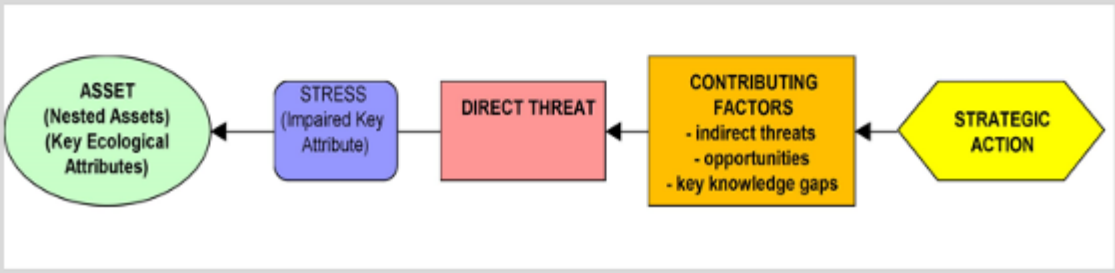
BOX 4: Conceptual models

Conservation projects are dynamic interventions that take place against a complex background of social, political, economic, cultural and environmental factors. A conceptual model (or situation analysis diagram) is a tool for visually depicting the context within which a project is operating and in particular, the major forces that are influencing the biodiversity of concern at the site. A well-developed model explicitly shows the relationships among the main contributing factors that drive one or more of the direct threats that, in turn, impact the conservation asset(s) of concern.

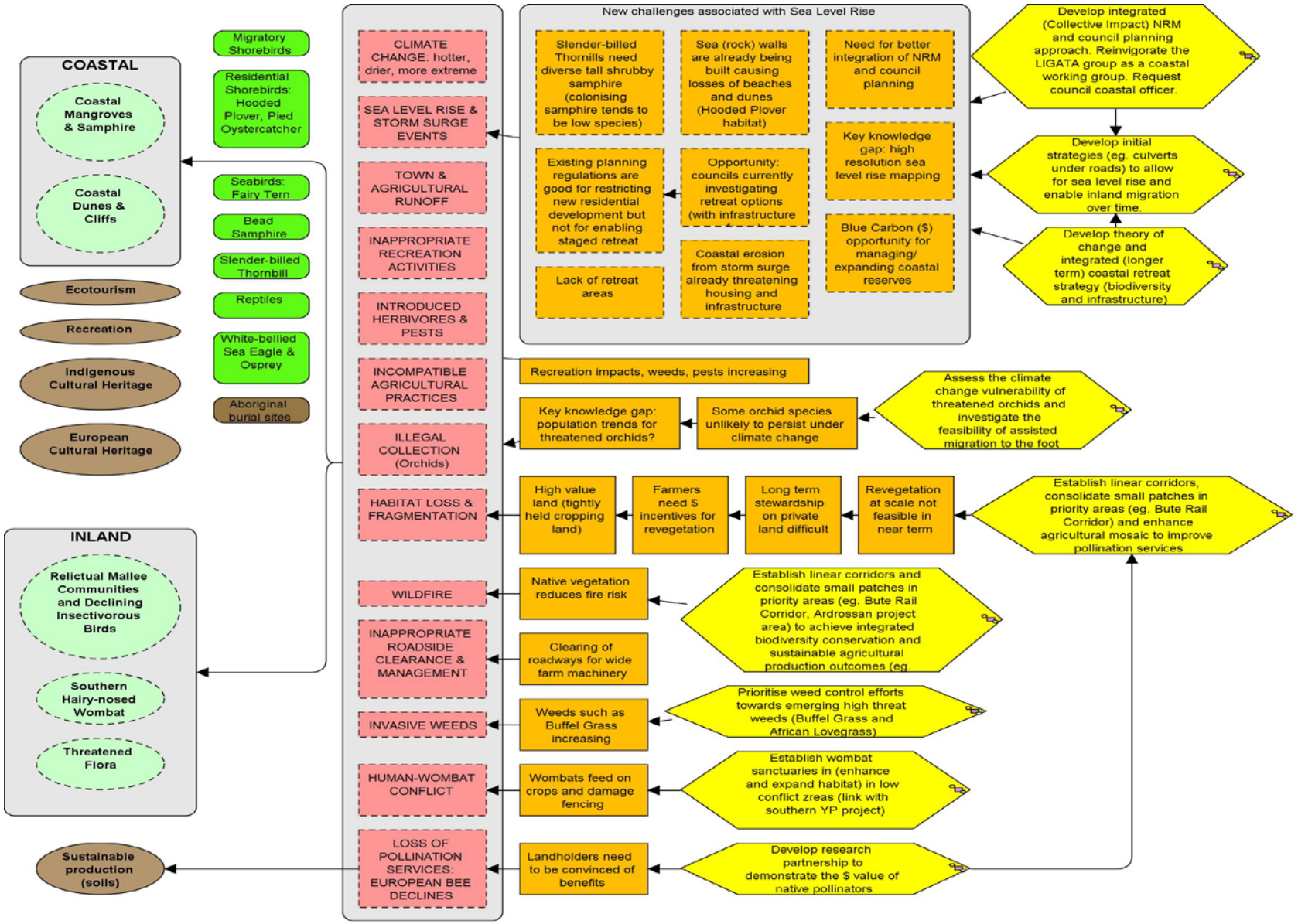
The conceptual model is usually constructed as part of a facilitated workshop in order to capture knowledge about threats to one or more assets and identify strategic actions based on a sound understanding of the various underlying drivers of threats and associated constraints and opportunities. For example, a pro-development state government may be a contributing factor to the direct threat of unsustainable urban development.

Asset: An element of biodiversity at a project site, which can be a species, ecological community, or habitat/ ecological system on which a project has chosen to focus.
Direct Threat: A human action or unsustainable use that immediately degrades one or more conservation assets (e.g., unsustainable logging, overgrazing, and urban development).
Contributing Factor: The indirect threats, opportunities, and other important variables that positively or negatively influence direct threats
Indirect Threat: A factor identified in a situation analysis that is a driver of direct threats, and is often an entry point for conservation actions (e.g. logging policies, demand for fish, and human population growth). Sometimes called a root cause or underlying cause.
Opportunity: A factor identified in a situation analysis that potentially has a positive effect on one or more assets, either directly or indirectly, and is often an entry point for conservation actions (e.g. demand for sustainably harvested timber).
Stress: The biophysical way in which a direct threat impacts a conservation asset (eg. altered vegetation structure and composition.

Derived from Foundation of Success (2009)



The following diagram shows the conceptual model for the Upper Yorke Peninsula subregion, highlighting important underlying factors that are contributing to threatening processes and outlining strategies to address them. Human wellbeing assets (non-biophysical values including recreation, ecotourism, indigenous and European cultural heritage and sustainable agriculture; shown as brown ellispses) have been included in the diagram for the purposes of this analysis.


COASTAL
Coastal Mangroves & Samphire
Coastal Dunes & Cliffs
Ecotourism
Recreation
Indigenous Cultural Heritage
European Cultural Heritage
INLAND
Relictual Mallee Communities and Declining Insectivorous Birds
Southern Hairy-nosed Wombat
Threatened Flora
Sustainable production (soils)
Migratory Shorebirds
Residential Shorebirds: Hooded Plover, Pied Oystercatcher
Seabirds: Fairy Tern
Bead Samphire
Slender-billed Thornbill
Reptiles
White-bellied Sea Eagle & Osprey
Aboriginal burial sites
CLIMATE CHANGE: hotter, drier, more extreme
SEA LEVEL RISE & STORM SURGE EVENTS
TOWN & AGRICULTURAL RUNOFF
INAPPROPRIATE RECREATION ACTIVITIES
INTRODUCED HERBIVORES & PESTS
INCOMPATIBLE AGRICULTURAL PRACTICES
ILLEGAL COLLECTION (Orchids)
HABITAT LOSS & FRAGMENTATION
WILDFIRE
INAPPROPRIATE ROADSIDE CLEARANCE & MANAGEMENT
INVASIVE WEEDS
HUMAN-WOMBAT CONFLICT
LOSS OF POLLINATION SERVICES: EUROPEAN BEE DECLINES
New challenges associated with Sea Level Rise
Slender-billed Thornills need diverse tall shrubby samphire (colonising samphire tends to be low species)
Sea (rock) walls are already being built causing losses of beaches and dunes (Hooded Plover habitat)
Need for better integration of NRM and council planning
Existing planning regulations are good for restricting new residential development but not for enabling staged retreat
Opportunity: councils currently investigating retreat options (with infrastructure
Key knowledge gap: high resolution sea level rise mapping
Lack of retreat areas
Coastal erosion from storm surge already threatening housing and infrastructure
Blue Carbon ($) opportunity for managing/ expanding coastal reserves
Develop integrated (Collective Impact) NRM and council planning approach. Reinvigorate the LIGATA group as a coastal working group. Request council coastal officer.
Develop initial strategies (eg. culverts under roads) to allow for sea level rise and enable inland migration over time.
Develop theory of change and integrated (longer term) coastal retreat strategy (biodiversity and infrastructure)
Recreation impacts, weeds, pests increasing
Key knowledge gap: population trends for threatened orchids?
Some orchid species unlikely to persist under climate change
Assess the climate change vulnerability of threatened orchids and investigate the feasibility of assisted migration to the foot
High value land (tightly held cropping land)
Farmers need $ incentives for revegetation
Long term stewardship on private land difficult
Revegetation at scale not feasible in near term
Establish linear corridors, consolidate small patches in priority areas (eg. Bute Rail Corridor) and enhance agricultural mosaic to improve pollination services
Native vegetation reduces fire risk
Establish linear corridors and consolidate small patches in priority areas (eg. Bute Rail Corridor, Ardrossan project area) to achieve integrated biodiversity conservation and sustainable agricultural production outcomes (eg
Clearing of roadways for wide farm machinery
Weeds such as Buffel Grass increasing
Prioritise weed control efforts towards emerging high threat weeds (Buffel Grass and African Lovegrass)
Wombats feed on crops and damage fencing
Establish wombat sanctuaries in (enhance and expand habitat) in low conflict zreas (link with southern YP project)
Landholders need to be convinced of benefits
Develop research partnership to demonstrate the $ value of native pollinators

5.1 Foundational Objectives and Key Actions

5.1.1 By 2020, attract sufficient funding to successfully implement at least two high priority projects within the Upper Yorke Peninsula conservation project (see section 7).

- Develop an investment prospectus for high priority projects and activities and pursue funding across government, corporate and philanthropic sectors.
- Develop detailed project proposals and funding applications as required.

5.1.2 By 2020, ensure that priority projects are delivered in accordance with Collective Impact principles and achieve successful integration of planning and implementation across council and Natural Resource Management sectors.

- Develop integrated (Collective Impact) NRM and council planning approach.
- Reinvigorate the LIGATA group as a coastal working group.
- Request council coastal officer to work with NRM practitioners on key projects.

5.1.3 By 2020, ensure that key knowledge gaps identified for the region have been addressed through research partnerships, monitoring projects or knowledge reviews.

- Review existing knowledge of nationally threatened flora to establish current status, trends and management priorities. Assess the climate change vulnerability of nationally threatened flora and determine the feasibility of assisted migration to the foot of the Yorke Peninsula.
- Pursuit partnership with Dr Katja Hoogendoorn (University of Adelaide) to demonstrate the production benefits of native vegetation for crop pollination**.** Determine whether small revegetation projects within cropping areas are likely to benefit agricultural production.
- Acquire high resolution elevation data for the region and undertake sea level rise impact mapping to inform integrated planning for sea level rise and storm surge.

5.2 Conservation Objectives and Key Actions

The following objectives and actions outline initial conservation and land management strategies identified for the region. Further actions relating to specific project areas are given in section 7.

5.2.1 By 2020, manage invasive weeds, pest animals, recreation impacts and other threats in high priority coastal project areas to measurably improve vegetation condition, implement initial sea level rise mitigation strategies, protect shorebird habitats and enhance significant cultural sites.

- Manage invasive weeds, pest animals, recreation impacts and other threats in high priority coastal project areas
- Develop initial strategies (eg. culverts under roads) to allow for sea level rise and ensure that coastal mangroves and samphire are able to migrate inland over time.
- Actively enhance samphire habitat for Slender-billed Thornbills in the Point Price to Port Arthur project area.
- Develop theory of change and integrated (longer term) coastal retreat strategy (biodiversity and infrastructure)

5.2.2 By 2030, consolidate, enhance and reconnect relictual mallee habitats in at least one priority project area to improve the viability of nationally threatened flora and declining woodland birds.

- Establish linear corridors and consolidate small patches in priority areas (eg. Bute Rail Corridor, Ardrossan project area) to achieve integrated biodiversity conservation and sustainable agricultural production outcomes (eg. through strategic firebreaks, windbreaks etc.)

5.2.3 By 2020, eradication (i.e. removal & on-going follow up) of outlying occurrences of priority environmental weeds (Buffel Grass, African Lovegrass) and on-going reduction of core infestations to prevent further spread.

- Prioritise weed control efforts towards emerging high threat weeds (Buffel Grass and African Lovegrass)

5.2.4 By 2025, at least two wombat sanctuaries have been established on the Yorke Peninsula to ensure population persistence (eg. Wardang Island, Point Pearce)

6. Identification of Priority Project Areas

BOX 6: Identification of Priority Project Areas

Spatial prioritisation to identify high priority sites for undertaking on-ground works is widely recognised as an essential step for maximising the impact of conservation investments, particularly in situations where funding is limited and problems are widespread and expensive to manage.

There are many tools available for spatial conservation planning, ranging from GIS-based tools such as MARXAN and Zonation to less GIS-intensive tools such as INFFER that are designed for assessing return on investment from different projects (see Moilanen et al. 2009 and Wintle 2011 for a review). Each of these tools can be used in conjunction with the Open Standards framework to enhance spatial information and prioritise among sites for on-ground activities.

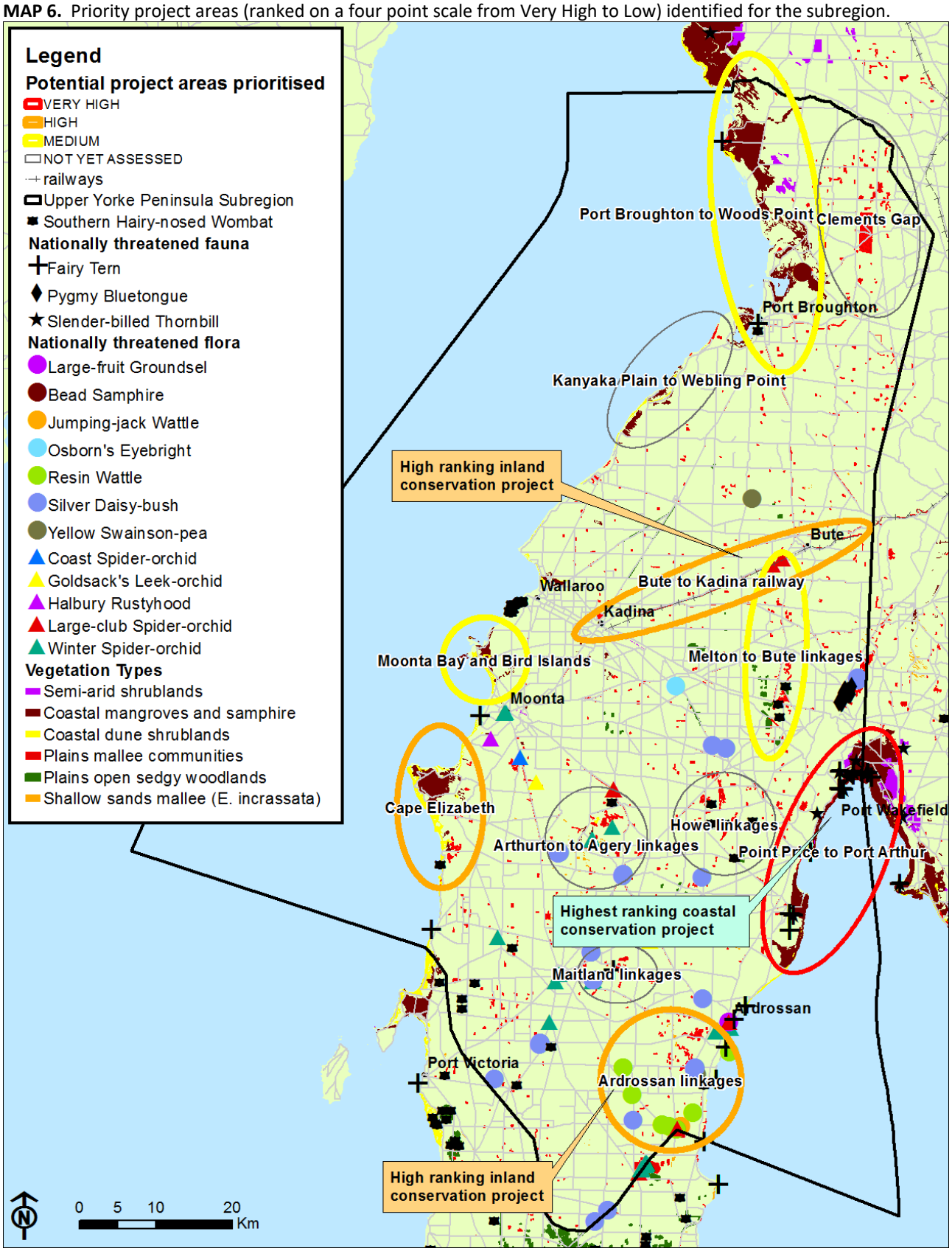
As a first iteration assessment of priority project areas for a given strategy, a simple prioritisation matrix is a simple but powerful tool for capturing local knowledge about different potential project sites and prioritizing among them. This approach combines use of the best available GIS information with workshops to elicit local knowledge ("participatory mapping") about values, threats and feasibility issues associated with different geographic areas, and involves the following steps:

1. Start with a strategy (eg. targeted invasive weed control program) that has multiple project areas and requires prioritisation of on-ground activities
2. Assemble relevant GIS layers (this might include relatively basic GIS layers such as weed locations and vegetation types or it may include sophisticated GIS layers such as output conservation significance maps from Zonation)
3. Identify (circle) and list potential project sites based on GIS maps and knowledge of where threats are occurring.
4. Agree on rating criteria for conservation value (eg. presence of nested assets such as threatened species, current condition, connectivity), threat severity (eg. severity of weed infestation) and feasibility (eg. ease of weed control, land accessibility etc.)
5. Fill out the prioritisation matrix, scoring conservation value, threat severity and feasibility according to a four-point scale (VH, H, M, L) for each project area or site. Document information about values, threats, feasibility issues and knowledge gaps for each project area.

1. List potential sites

PROJECT AREA	VALUES RATING	THREAT RATING	FEASIBILITY RATING	PRIORITY RANK
Site 1	VH	H	H	VH
Site 2	H	H	H	H
Site 3	H	M	H	H
Site 4	M	H	M	M
Site 5	M	M	M	M
Site 6	M	L	M	L

MAP 6. Priority project areas (ranked on a four point scale from Very High to Low) identified for the subregion.



The Point Price to Port Arthur project area was identified as the highest priority coastal project, with Cape Elizabeth as a second priority. Two project areas, the Bute to Kadina railway and Ardrossan linkages areas, were identified as high priorities for consolidating relictual mallee communities and enhancing habitats for threatened flora and declining woodland birds. Further details of project areas, including values, important threats, feasibility issues and actions are given in Table 6.

Table 6. Identification of Priority Project Areas for the Upper Yorke Peninsula Subregion.

PROJECT AREA	VALUES	VALUE RATING	THREATS	THREAT RATING	FEASIBILITY ISSUES	FEASIBILITY RATING	PRIORITY RANK	ACTIONS
Point Price to Port Arthur	Slender-billed Thornbill population, Fairy Tern, important rearing site for WBS Eagles (Price area), adjoining plains mallee and arid shrubland communities, estuary of national significance, migratory and resident shorebirds, SHN Wombat; recreation values (Walk the Yorke)	VERY HIGH	Weeds (Boxthorn, SL Nightshade, Calomba Daisy, Buffel Grass), Foxes and Cats (H), Sea level rise (migration barriers), rabbits and rats	HIGH	National funding profile (SB Thornbill, IBA, DIWA-listed Estuary), good community linkages across area, difficult to control entrenched coastal weeds, coast highway limits inland migration with sea level rise	HIGH	VERY HIGH	Integrated land use planning and zoning for sea level rise (incl culverts under road to allow natural hydrology); facilitate coordinated management, integrated pest plant and animal management, signage and access barrier
Cape Elizabeth	Extensive coastal dune system in good condition, samphire, significant cultural values (indigenous and European), recreational values (incl. Walk the Yorke), migratory shorebirds	HIGH	Sea level rise (though landward migration possible), recreation access, Acacia cyclops (high impact, entrenched), toxic rubbish dumping legacy issues	MEDIUM	Mixed land tenure makes coordinated land management challenging, rewilding concept has potential, but has met with community opposition in the past due to proposed fence across beach, Friends of the Cape group, Acacia cyclops very entrenched	MEDIUM	HIGH	Clean up toxic rubbish, maintain area in good condition, coordinated planning for Sea level rise impacts, promote sustainable uses, engage recreation user groups

Bute to Kadina railway	Large-club Spider Orchid (current?), important vegetation corridor, linkages to townships of Bute and Kadina	HIGH	Wildfire, invasive weeds, feral and native herbivores		Existing land corridor, land access less challenging, good potential for integration of sustainable agriculture management practices	HIGH	HIGH	Pest plant and animal management, remnant enhancement, protection of threatened orchids, potential cycling corridor, maintain as a strategic firebreak (slows down wildfire in croplands), revegetation of windbreaks to prevent soil movement
Ardrossan linkages	Resin Wattle, Silver Daisy-bush, Large-club Spider-orchid, relictual mallee, regionally declining insectivorous birds such as Red-capped Robins; coastal indigenous heritage sites	VERY HIGH	Habitat fragmentation, invasive weeds, total grazing pressure and damage from feral and native herbivores (wombats and wallabies), roadside management issues (fire, drainage)	HIGH	Land access for revegetation the major challenge, possible SEB funding, mining-corporate funding	MEDIUM	HIGH	Revegetation to consolidate and link patches of vegetation, council markers for improved roadside veg management, integrated pest plant and animal management
Melton to Bute linkages	SHN Wombat, multiple veg types, abundance of wildlife such as goannas and echidnas, important wildlife corridor	MEDIUM	Wildfire, invasive weeds, feral and native herbivores	MEDIUM	Challenges with wombat management, land access in tightly held cropping land	MEDIUM	MEDIUM	Revegetation for patch consolidation, linkages; integrated pest plant and animal management, management of adjacent agricultural lands (reveg for soil protection)

Moonta Bay and Bird Islands	Complex mosaic of dune shrublands and samphire, complex coastline with deeply dissected bays, Bird Islands CP (2 islands), migratory birds, Eastern Osprey, Pied Oystercatcher, Rock Parrot	MEDIUM	Off-road vehicles (motorbikes and four wheel drives), sea level rise	MEDIUM	Weeds easier to manage threats in parks	MEDIUM	MEDIUM	Support community group, Narrunga group, manage tourism, engage recreation user groups in solution-driven approach to conservation issues, events such as enduro ride
Port Broughton to Woods Point	Shorebirds, significant creeks, large samphire area, important bird area, reptiles, unique habitats eg. shellgrit areas	HIGH	Grazing, septic tanks, weeds, foxes and cats, rubbish dumping, shacks	MEDIUM	Much of coastal land private and inaccessible, relationships with landholders not well established, some difficult	HIGH	MEDIUM	Biological survey, need published Northern and Yorke Coastal Action Plan to assist funding, integrated pest plant and animal control
Arthurton to Agery linkages	Silver Daisy-bush, Large-club Spider-orchid, SHN Wombat, Winter Spider-orchid, good remnancy and diversity of vegetation types	HIGH					NOT YET ASSESSED	
Maitland linkages	Silver Daisy-bush, Winter Spider-orchid	HIGH					NOT YET ASSESSED	
Clements Gap	Good remnancy including Clements Gap Conservation Reserve	HIGH					NOT YET ASSESSED	
Howe linkages	Good remnancy, SHN Wombat	MEDIUM					NOT YET ASSESSED	
Kanyaka Plain to Webling Point		LOWER					NOT YET ASSESSED	

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