



South Australian Arid Lands Biodiversity Strategy Draft



SANDY DESERTS CONSERVATION PRIORITIES

A partnership between
The Department for Environment and Heritage and
South Australian Arid Lands Natural Resources Management Board



Australian Government



Government
of South Australia

please visit www.environment.sa.gov.au and www.saalnrn.sa.gov.au



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INTRODUCTION

The **South Australian Arid Lands Biodiversity Strategy** has been developed by the South Australian Arid Lands Natural Resource Management Board (SAAL NRM Board) and the South Australian Department for Environment and Heritage (DEH).



The South Australian Arid Lands Natural Resource Management Region covers over 520,000 km², almost 53% of the State. The landscapes and biodiversity of this massive region are diverse and complex. Planning for biodiversity conservation at such large spatial scales requires a landscape-based system of classifying the land surface. The landscape classification system used for this strategy is the Interim Biogeographic Regionalisation for Australia (IBRA) regions. The IBRA bioregions found in the SAAL NRM region include the Stony Plains, Flinders Lofty Block, Broken Hill Complex, Channel Country, Simpson–Strzelecki Dunefields, Finke and Gawler bioregions.

The Strategy consists of six documents. Five documents identify conservation priorities for each of the bioregions that occur within the South Australian Arid Lands. These are the:

- *Channel Country Conservation Priorities*
- *Flinders and Olary Ranges Conservation Priorities*
- *Gawler Conservation Priorities*
- *Sandy Deserts Conservation Priorities*
- *Stony Plains Conservation Priorities*

The sixth document, *Region – Wide Priority Actions* identifies the region-wide goal for biodiversity conservation, sets resource condition targets that will enable us to measure our success in achieving this goal, and details a comprehensive suite of management action targets and strategies that must be implemented regionally in order to achieve this goal.

This document, **South Australian Arid Lands Biodiversity Strategy—Stony Plains Conservation Priorities**, has two sections. Section 1 describes the bioregion's natural attributes, land uses and the major threats to biodiversity. Section 2 sets out the priority actions for biodiversity conservation for the bioregion in the next five years. This document is one of five bioregional biodiversity strategies that, together, contribute to the South Australian Arid Lands Biodiversity Strategy.

The Sandy Deserts Conservation Priorities has been developed to address conservation priorities in the SAAL portion of the Simpson-Strzelecki Dunefields and Finke bioregions. The Simpson-Strzelecki Dunefields bioregion extends from south-east of the Northern Territory, through the south-east of South Australia into both Queensland and New South Wales, while the Finke bioregion is shared between the Northern Territory and South Australia.

PLANNING FRAMEWORK

Identifying Conservation Priorities

Biodiversity exists at three levels—genes, species and ecosystems—and occurs at a variety of spatial scales, from square metres to thousands of square kilometres. At each of the levels within the biodiversity hierarchy, it is necessary to identify thresholds where species, ecosystems or landscapes are recognised as priorities for targeted investment. Conservation priorities addressed by this strategy include:

- **Threatened Species;** Identified as Critically Endangered, Endangered or Vulnerable under the Australian Government's Environment Protection and Biodiversity Conservation Act 1999.
- **Endemic Species;** Identified as occurring only within a single bioregion.
- **Threatened Ecological Communities;** Identified as Critically Endangered, Endangered or Vulnerable under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999*, or identified in Neagle's (2003) *An Inventory of the Biological Resources of the Rangelands of South Australia*.
- **Significant Ecological Processes;** Significant ecological processes are those identified as being significant in maintaining the viability of species, communities, ecosystems or landscapes.
- **Other Species or Communities considered to be at risk** but not currently listed under the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999*.

Conservation priorities have been presented within this strategy as either significant ecological processes or groupings of species and ecological communities that share a common set of conservation requirements at similar spatial scales. Individual conservation priorities have been grouped under the major landforms present in the region.

Mapping Conservation Priorities at Multiple Scales

This strategy follows the method of Brandle (1998), who used broad landform patterns to group vegetation communities and categorise the landscape. Vegetation communities, land systems, subregions and IBRA bioregions are all categorised by the dominant landform at their respective scales. While the distribution of biodiversity correlates strongly with landform within bioregions, ecological processes, disturbance regimes and land use influence the distribution of biodiversity within the landscape.

Achieving Conservation Outcomes at Multiple Scales

Biodiversity conservation activities may be undertaken for species, terrestrial ecosystems and aquatic ecosystems at a variety of spatial scales. The presentation of conservation priorities geographically within the biodiversity strategy enables managers to build conservation programs that take into account the biodiversity hierarchy and the differing spatial scales at which biodiversity needs to be managed to achieve the desired conservation outcome.



WHO IS THIS STRATEGY FOR?

This strategy is designed to address the needs of three main stakeholder groups:

- The SAAL NRM Board, Government and other investors
- Scientists, Technicians, and NRM support staff
- Land managers.

SAAL Board, Government and other investors

The focus audience for this strategy is the SAAL NRM Board, State and Federal Government Departments with responsibility for biodiversity conservation, and other organisations currently investing, or wishing to invest, in conserving the biodiversity of the South Australian Arid Lands. The 20-year targets represent clear statements of intent about biodiversity conservation priorities in the Sandy Deserts bioregion and how they will be managed. Monitoring and evaluating progress against the identified performance criteria will contribute to regional reporting on biodiversity conservation efforts.

BIOREGIONAL FRAMEWORK

The Interim Biogeographic Regionalisation of Australia (IBRA) establishes a hierarchy of ecosystem classification for which the physical, climatic and biological characteristics are described.

Bioregions:

are continental scale (1:1 000 000) ecosystems that range in size from 1 to 20 million hectares. They are distinguished from adjacent regions by their broad physical and biological characteristics. They may include more than 30 landforms and 50 vegetation associations. Seven bioregions, or parts thereof, occur in the SAAL NRM region.

Subregions:

are sub-continental scale (1:500 000) ecosystems that range in size from 100 000 to 7 million hectares. They occur within IBRA bioregions and may include up to 15 landforms and 30 vegetation associations.

Landsystems:

are regional scale (1:250 000) ecosystems that range in size from 2000 to 5 million hectares. They occur within IBRA subregions and may include up to 5 landforms and 10 vegetation associations.

Vegetation communities:

are local scale (1:100 000) ecosystems that range in size from 5 to 5000 hectares and are based on a single landform and vegetation community.





The 5-year actions provide specific direction for targeting investment. In most instances, the actions can be implemented as new projects, or part of existing projects currently undertaken by the SAAL NRM Board, Government Departments and other stakeholders. Responsibility for delivering each action has not been detailed. Organisations, funding initiatives, programs and projects come and go at the whim of economics and politics, so allocating organisational responsibility becomes rapidly dated. Ultimately, the SAAL NRM Board and Government are responsible for the ongoing process of working with other stakeholders to deliver each action.

Scientists, Technicians, and NRM support staff

The strategy also has two main uses for biologists, ecologists, NRM support staff and others involved in the delivery of biodiversity conservation and NRM projects and programs.

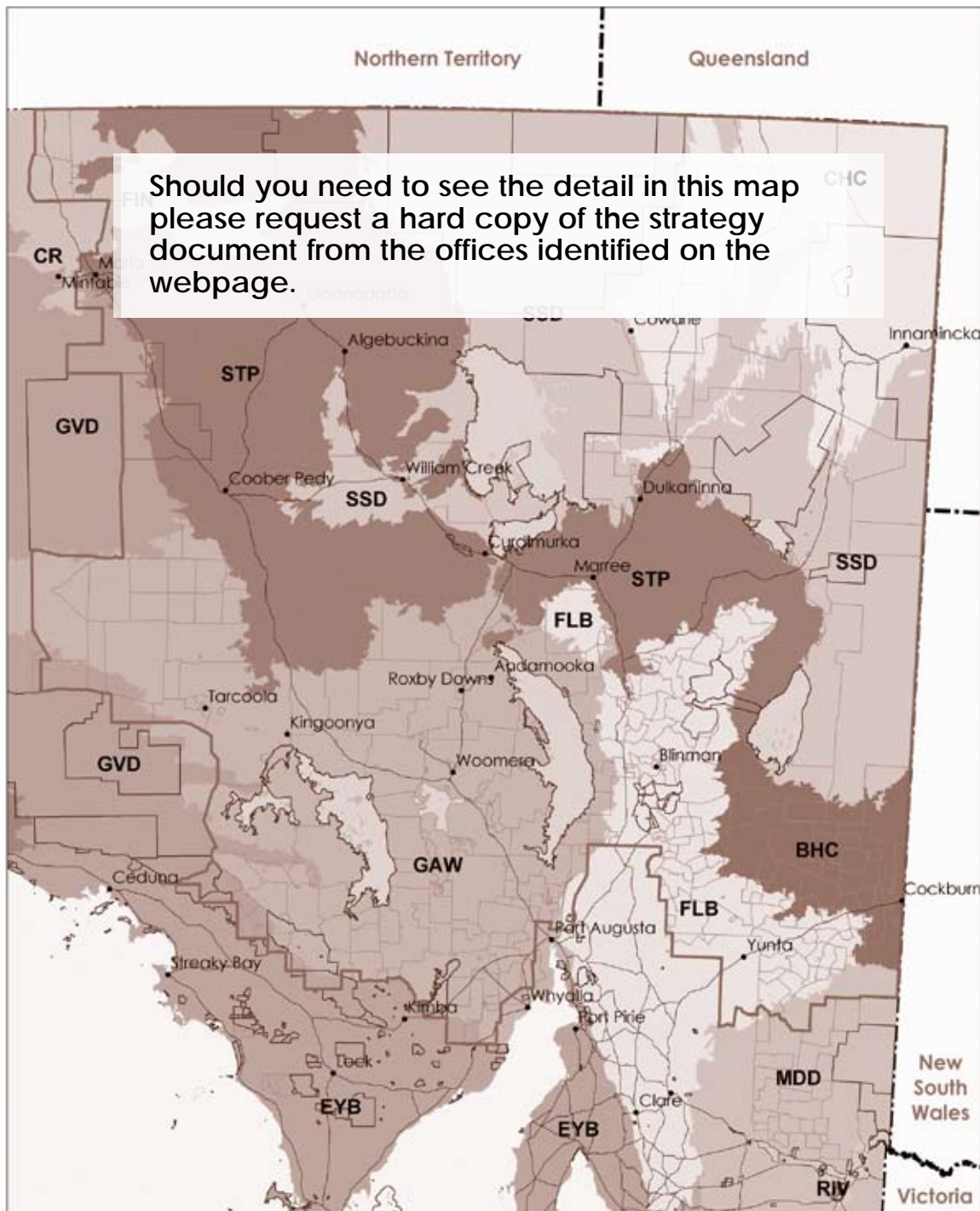
1. It provides an agreed set of priorities for biodiversity conservation in the Sandy Deserts. Technical staff can confidently structure existing or new projects to deliver the actions identified for each conservation priority.
2. It identifies practical strategies for direct involvement by land managers. Technical staff can use these strategies to structure and develop engagement and extension programs to build capacity of land managers to achieve effective biodiversity conservation outcomes.

Land Managers

For the land managers of the Sandy Deserts, this document clearly sets out the agreed biodiversity conservation priorities for the bioregion, and describes the types of activities that need to be undertaken to address these priorities. The document also suggests practical strategies and actions that land managers can undertake on their own land, as part of their day-to-day operations, to maintain and improve biodiversity on their country.



South Australian Arid Lands NRM Region IBRA Bioregions



IBRA Code	Bioregion Name
BHC	Broken Hill Complex
CHC	Channel Country
CR	Central Ranges
EYB	Eyre Yorke Block
FIN	Finke
FLB	Flinders Lofly Block
GAW	Gawler
GVD	Great Victoria Desert
KAN	Kanmantoo
MDD	Murray Darling Depression
NUL	Nullarbor
RIV	Riverina
SSD	Simpson Strzelecki Dunefields
STP	Stony Plains

	South Australian Arid Lands NRM Region
	DEH Managed Area
	Indigenous Protected Area
	Salt Lake
	Pastoral Lease



SECTION 1

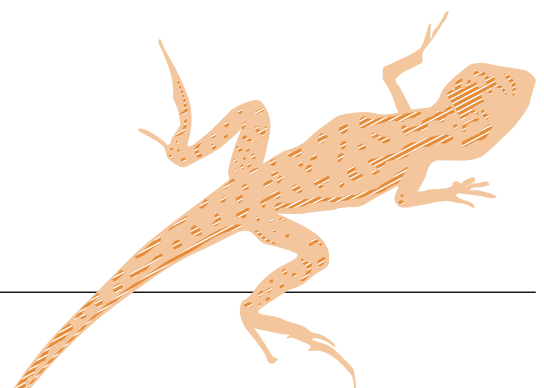
SANDY DESERTS DESCRIPTION

IBRA Subregions

Major Landforms

Major Land Uses

Threats to Biodiversity



SANDY DESERTS DESCRIPTION

Covering an area of 149 188 km² of South Australia, the Simpson–Strzelecki Dunefields and Finke bioregions represent 28.67% of the South Australian Arid Lands and 15.21% of the State*.



The Finke bioregion, situated across the Northern Territory and South Australia border is characterised by sand plains and dissected uplands. In the north western corner of the SAAL region, gently undulating plains with some granite inselbergs and silcrete-capped mesas grade into silcrete-capped tablelands in the east. Further south, in the Pedirka Desert, gently undulating plains with parallel dunes are dominant.

The Simpson-Strzelecki Dunefields bioregion is one of the largest linear sand dune environments in the world. The region forms part of a huge complex of linear dunes in central Australia, dunefields that extend well into Queensland, the Northern Territory and north-western New South Wales.

Lake Eyre, in the southern part of the Simpson-Strzelecki bioregion, is the fifth largest terminal lake in the world, with a catchment covering over a million square kilometres, almost one-sixth of Australia. The Cooper, Diamantina and Georgina catchments feed down from Queensland through the Channel Country bioregion and the Neales, Macumba, Anna, Warrana, Margaret, Frome and Clayton Creeks flow in from the west and south.

Stream channels from the Tibooburra and Barrier Ranges in New South Wales flow west toward Lake Callabonna and Lake Frome through the southern Strzelecki Desert, but runoff is insufficient to reach the distant lakes. All creeks and rivers of the region are ephemeral with short periods of flow following rain, and long periods with no flow at all. They change from dry channels with occasional waterholes in dry times to slow moving 'inland seas' many kilometres wide during floods.

Several major watercourses, including the Alberga, Hamilton and Curralulla Creeks, traverse through the Finke bioregion and drain south east towards Lake Eyre.

Lake Eyre, 18 m below sea level, is the lowest point in Australia. Hundreds of thousands of years ago, central Australia was a vast basin alternately covered by freshwater lakes and the sea. During the final freshwater period, a layer of organic material became consolidated from decomposing vegetation, eventually creating the oil and



*Bioregions and subregions are the reporting unit for assessing the status of native ecosystems, their protection in the national reserve system and for use in the monitoring and evaluation framework in the Australian Government's current Natural Resource Management initiatives. The IBRA boundaries presented in this report are provisional and unpublished and will not be officially recognised until IBRA version 7 is released in 2009. Monitoring and evaluation on the Sandy Deserts will be consistent with national guidelines and fit the national monitoring and evaluation framework.

gas currently being extracted from the Cooper Basin wells at Gidgealpa, Moomba, Ballera and other satellite fields. About 40 000 years ago, as the centre of the continent became more arid, the surface sand became mobile and was blown into the Lake Eyre Basin. The continuation of the arid climate allowed the prevailing winds to form the extensive complex of parallel longitudinal dunes that make up the Simpson, Tirari and Strzelecki Deserts.

At a landscape scale, between the dunes are clay and salt pans, sand drifts and sand plains. Some of the higher dunes have active crests, though most are stable. Dune spacing varies, and the swales may expose an underlying stony plain, deep alluvial sands and clays, or calcareous sandy soils. On the mobile sand areas, including dune crests, Sandhill Cane-grass and other grasses and herbs grow. On the more stable sands are Lobed Spinifex, grasses and shrubs, including some Mulga and wattles. Dunefields, sand plains and flood plains all have occasional clay pans and ephemeral lakes.

The region is characterised by extreme climatic variability and that has brought about a huge variety of landscapes and habitats. Distribution and availability of water is a key factor determining what plants and animals can live there. Despite this arid and often harsh and unforgiving landscape, the region is full of plants and wildlife that have adapted remarkably well. Besides the variety of small mammals, such as Hopping Mice, Dunnarts and Mulgaras, Dingoes and Kangaroos are also found. There are numerous reptiles including Military Dragons, Perenties, Australia's largest lizard, Goannas, Western Brown Snakes, Woma Pythons and Banded Skinks, also known as Sand Swimmers because of the way they move over the sand. Of the more than 150 species of birds that inhabit the sandy deserts, there are the rare Eyrean Grasswren and Australian Bustard, and the more common Wedge-tailed Eagles, Brown Falcons, Budgerigars and Zebra Finches. Black Kites, Crested Pigeons and Galahs are also common in the flood plain areas, and a variety of waterbirds, some migratory, can be found, sometimes in huge numbers on the playa lakes when there is water about. The semi-permanent wetlands, rivers and flood plains provide a great variety of habitats due to the variability of flows. Many water and land-based species depend on these refuge areas for survival during dry periods, and they are important breeding areas for many species that forage and hunt in the adjacent dunefields and sand plains.

Much of the plant life has adapted to the extreme and unpredictable seasonal conditions, with short lifecycles enabling opportunistic germination, growth, flowering and setting seed after rain. Following any significant rain, it is a spectacular sight to see flowers blooming profusely in such a harsh arid environment. Changes to vegetation cover, construction of water storages and flood plain levees, and even poorly sited roads, can alter the flow patterns and change river and flood plain ecosystems.

Human involvement in the management of the Sandy deserts has introduced a range of environmental influences. There are the introduced feral animals including rabbits, foxes, camels and donkeys. When camels became redundant for transportation in the 1920s, they were released into the wild. With a population now estimated at over 500 000 roaming the sandy areas of outback Australia, this is the largest free-ranging camel herd in the world. Plants introduced from other regions in Australia as well as from overseas, include Athel Pine, Noogoora Burr, Buffel Grass and Prickly Acacia.



IBRA SUBREGIONS

Six IBRA subregions occur within the SAAL component of the Simpson–Strzelecki Dunefields and Finke bioregions.



Detailed descriptions of the landsystems of the Simpson–Strzelecki Dunefields and Finke bioregions can be found in the District Plans published by the Marla–Oodnadatta and Marree Soil Conservation Boards.

Simpson–Strzelecki Dunefields Bioregion Simpson Desert (SSD2)

An extensive field of parallel dunes separated by flat interdune corridors.

Total Area: 18 319 km². *Landsystems:* Simpson.

Dieri (SSD3)

An extensive dunefield interrupted by large claypans grading into a large playa complex of salt lakes with gypsum dunes, and surrounding plain with channels and dunes.

Total Area: 48 475 km². *Landsystems:* Eyre; Jeljendi; Piarooka and Tirari.

Warriner (SSD4)

A gently sloping plain with extensive dunefields, isolated gypcrete remnants, broad flood plains and large pans.

Total Area: 10 304 km². *Landsystems:* Piarooka and Wattiwarriganna.

Strzelecki Desert (SSD5)

An extensive dunefield with numerous small claypans, and a chain of inter-connected salt lakes with gypsum dunes along the eastern margins.

Total Area: 59 724 km². *Landsystems:* Blanche; Eurinilla; Namba and Strzelecki.

Finke Bioregion

Tieyon (FIN3)

A gently undulating plain with some granite inselbergs and low silcrete capped mesas grading into dissected silcrete-capped tablelands.

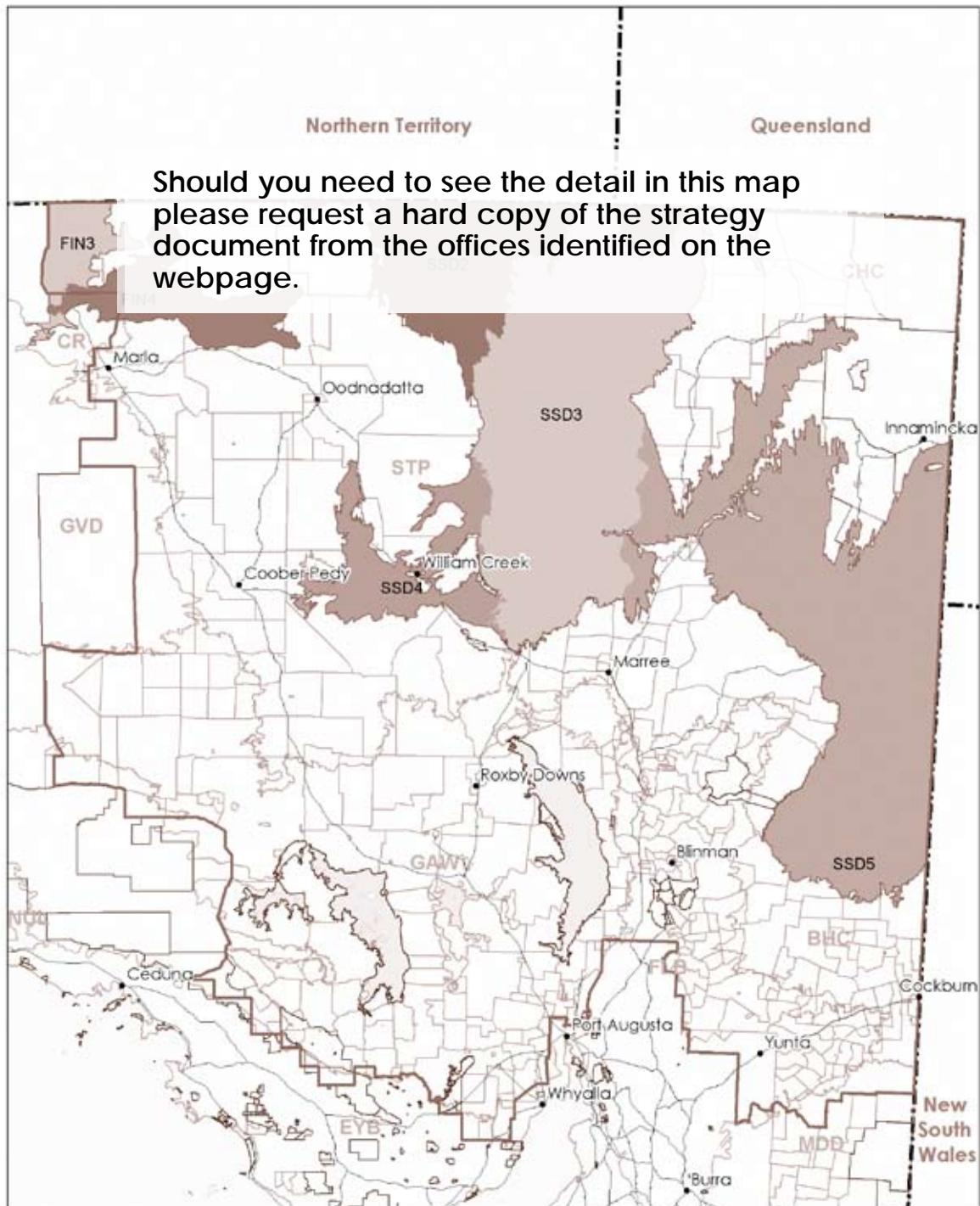
Total Area: 4 657 km². *Landsystems:* Moorilyanna and Wantapella.

Pedirka (FIN4)

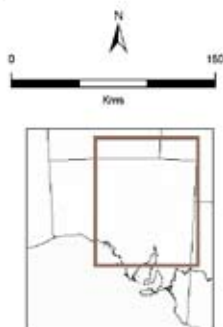
A gently undulating plain with parallel dunes.

Total Area: 9 062 km². *Landsystems:* Alberga; Pedirka and Tieyon.

Sandy Deserts IBRA Bioregion – IBRA Subregions



Should you need to see the detail in this map please request a hard copy of the strategy document from the offices identified on the webpage.



Subregion	
IBRA Code	Subregion Name
FIN3	Tieyon
FIN4	Pedirka
SSD2	Simpson Desert
SSD3	Dieri
SSD4	Warriner
SSD5	Strzelecki Desert

	IBRA Bioregions outside of Sandy Deserts
	South Australian Arid Lands NRM Region
	DEH Managed Area
	Pastoral Lease
	Salt Lake

MAJOR LANDFORMS

There are four major landforms in the Sandy Deserts. In this document, conservation priorities have been grouped under each of the landforms.



Drainage Lines and Flood Plains

Ephemeral watercourses and flood plains draining into six surface water basins: Cooper Creek, Diamantina River, Finke, Georgina River, Hay River and Lake Frome.

Subregions: SSD2; SSD3; SSD4; SSD5; FIN3 and FIN4.

Salt Lakes

Salt lakes, shoreline dunes, lunettes and saline deltas.

Subregions: SSD2; SSD3; SSD4 and SSD5.

Great Artesian Basin Springs

High conservation value wetlands found on the margins of the Great Artesian Basin.

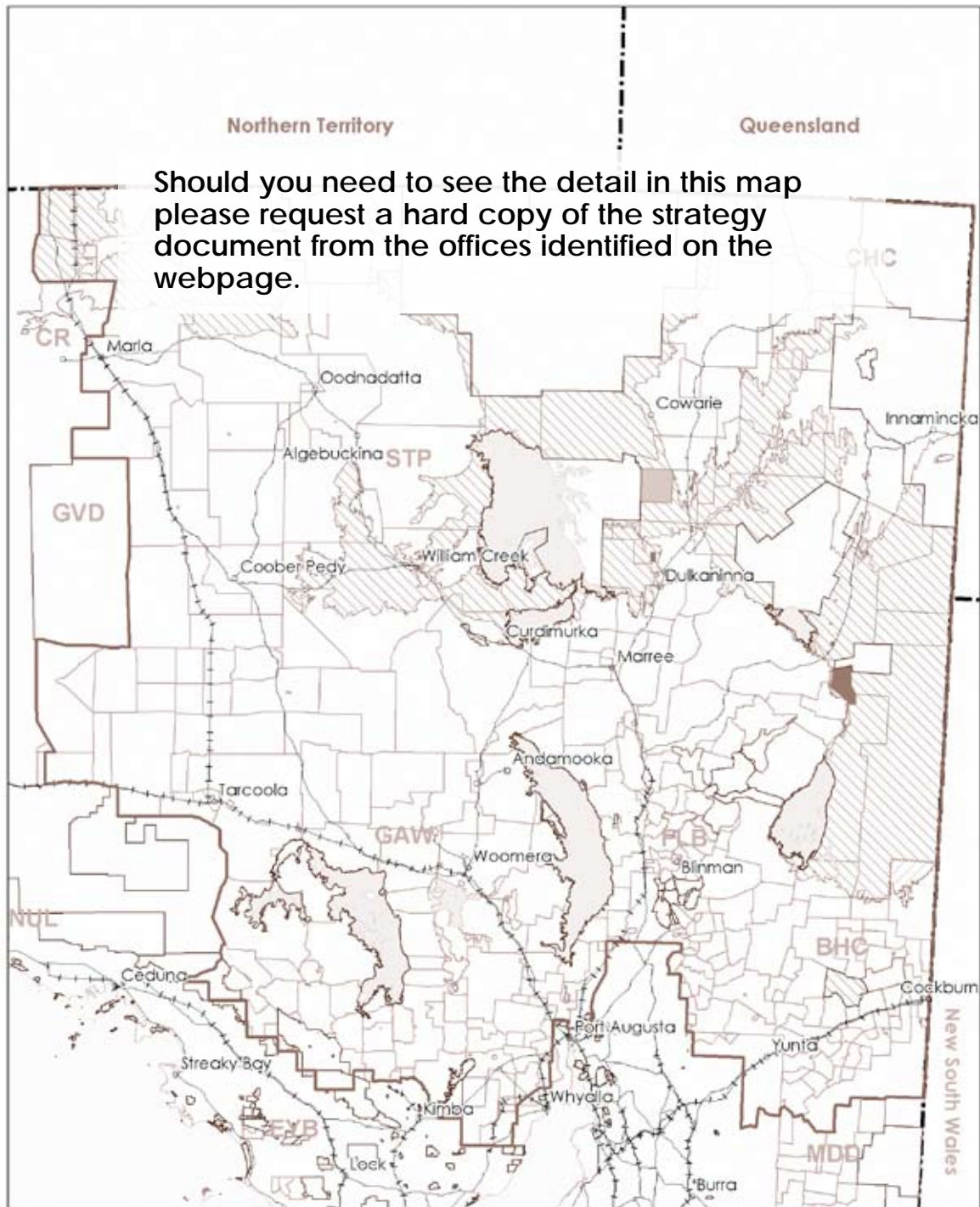
Subregion: SSD5.

Dunefields and Sand Plains

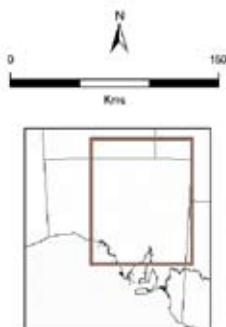
Characterised by parallel dunes of varying spacing and sand plains of varying depths over underlying heavier soils which at times may be exposed.

Subregions: SSD2; SSD3; SSD4; SSD5; FIN3 and FIN4.

Sandy Deserts IBRA Bioregion – Land Use



Should you need to see the detail in this map please request a hard copy of the strategy document from the offices identified on the webpage.



Land Use

- | | | |
|--------------------------------------|---|--|
| Pastoral Lease (Cattle) | Indigenous Protected Area | Simpson Strzelecki Dunefields and Finke Bioregions |
| Pastoral Lease (Predominantly sheep) | Pastoral lease managed primarily for conservation | IBRA Bioregions outside of Flinders and Olary Ranges |
| Non-pastoral Leasehold | DEH Managed Area | South Australian Arid Lands NRM Region |
| Unallotted Crown Land | Mine Tenement | Pastoral Lease |
| Government Town | Major Mining Activity | Salt Lake |
| Crown Lands Act Reserves | Operating | |
| | Prospect | |
| | Resource | |

MAJOR LAND USES

There are four major land uses in the Sandy Deserts.



Pastoralism

The Simpson–Strzelecki Dunefields bioregion supports the lowest levels of pastoralism within the SAAL region. Covering less than half of the bioregion, much of the Simpson and Strzelecki Deserts does not support set stocking strategies, with opportunistic grazing based on season being commonly employed. In the SAAL portion of the Finke bioregion, pastoralism is the dominant land use. Cattle grazing for beef production is the principal pastoral enterprise.

Conservation

Within the Simpson–Strzelecki Dunefields bioregion, the Simpson Desert Conservation Park, Simpson Desert Regional Reserve, Lake Frome Regional Reserve, Strzelecki Regional Reserve and Lake Eyre National Park occur in the bioregion in their entirety. Kalamurina is a privately managed pastoral lease that also contributes to conservation within the region. Innamincka Regional Reserve occurs only partially within the bioregion. Lake Callabonna Fossil Reserve is dedicated as an area of very high palaeontological significance. There are no conservation reserves in the Finke bioregion.

Tourism

Away from the major public access routes (Birdsville and Strzelecki tracks), tourism within the region is restricted primarily to 4WD tours through the Simpson Desert and to Lake Eyre. During wet seasons, flights over Lake Eyre are very popular.

Mining and Petroleum

Petroleum activity within the two bioregions is restricted to the oil and gas fields in the Strzelecki Desert. There are over 80 oil and gas fields in the region, tapping reserves in the southern part of the Cooper Basin. Mining within the region is restricted extraction of material from borrow pits for the development of oil and road infrastructure.

THREATS TO BIODIVERSITY

There are many threats to biodiversity in the Sandy Deserts. Some are specific to particular areas, or act primarily within the Sandy Deserts, whilst others extend across multiple bioregions or jurisdictions.



The impacts of these threats also vary with time. The main threats to biodiversity in the Sandy Deserts include the following.

Excessive Total Grazing Pressure

The combined effects of excessive grazing pressure from domestic stock and feral and native herbivores.

Impact: Reduction in recruitment of some native plant species (decreasers); increase in recruitment of some unpalatable native plant species (increasers); loss of native animals due to competition for resources; reduction in habitat quality and increased spread of weeds and disease.

Reduction in Great Artesian Basin Water Pressure

Levels of water extraction from the Great Artesian Basin (GAB) resulting in a reduction in artesian pressure and flow of water to the surface. **Impact:** Reduced availability of water at the springs and likely reduction in area of GAB dependent communities.

Alteration to Natural Water Flows

Restrictions to natural flow and/or flooding regimes of a watercourse due to diversions or the construction of artificial flow barriers and storage areas, including seismic lines, tracks, roads, borrow pits, dams and other infrastructure. **Impact:** Change in ecosystem structure, disruption of dispersal mechanisms of aquatic species; loss of refuges and increased soil erosion and salinity.

Competition for Resources

Introduced fauna and flora species compete with native species for food, water and shelter. **Impact:** Loss of native plant and animal species; reduction in recruitment and density of native plants and animals and change in species composition of ecosystems.

Excessive Predation

Hunting and consumption of native animals by introduced feral species. **Impact:** Loss of native animals and change in species composition of ecosystems.

Altered Fire Regimes

Changes to intensity, season and frequency of fire from the previous regime under which the ecosystem evolved. **Impact:** Change in ecosystem structure and habitat value and loss of local populations of plants and animals.

Mechanical Disturbance

Changes to the vegetation cover as a consequence of human activity that leaves the soil exposed. **Impact:** Loss of habitat and reduction in habitat value for native species; increased potential spread of weeds and increased native species and increased soil erosion.

Pollution

Reduction in quality of ground and/or surface water as a consequence of human activity. **Impact:** Loss of native species and decline in habitat value in and surrounding waterholes.

Climate Change

Changes in rainfall patterns and increase in temperature. **Impact:** Reduction in the geographic range of species; changes in the location, structure and composition of habitats and ecosystems; increased risk of extinction of already vulnerable species and expansion of invasive species.

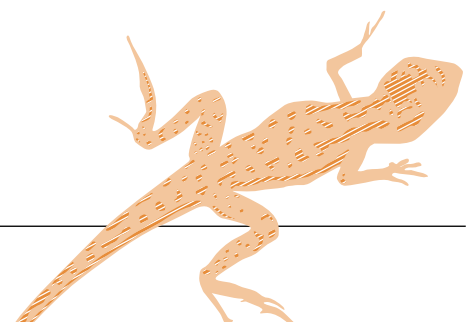




SECTION 2

CONSERVATION PRIORITIES FOR THE SANDY DESERTS

Landforms	Conservation Priorities
Drainage Lines and Flood Plains	<ul style="list-style-type: none">• Ecological response to water flows in of the Strzelecki Creek wetland system• Threatened ecological communities on flood plains and swamps
Salt Lakes	<ul style="list-style-type: none">• Significant breeding events of the endemic Banded Stilt
Great Artesian Basin Springs	<ul style="list-style-type: none">• Habitat diversity of the Lake Callabonna-Lake Frome Great Artesian Basin Spring Complex
Dunefields and Sand Plains	<ul style="list-style-type: none">• Threatened Dusky Hopping-mouse in the Strzelecki Desert• Threatened Marsupial Mole in the Simpson Desert and Finke bioregion• Threatened ecological communities on low dunes and sand plains



DRAINAGE LINES, FLOOD PLAINS

Drainage systems of both Simpson–Strzelecki Dunefields and Finke bioregions consist of complexes of waterholes, braided streams, channels, flood plains and ephemeral lakes. The Strzelecki Creek is an overflow of the Cooper Creek and a major feeder stream of Lake Blanche, a shallow ephemeral freshwater lake that increases in salinity as it dries out. The Cooper, Warburton and Strzelecki Creek systems also include fields of parallel sand ridges with interdune areas connected to the main channels which are periodically flooded. There are multiple flood plains and lakes which vary considerably depending on frequency and intensity of flooding.

Coolibah and Broughton Willow (*Acacia Salicina*) Woodland, often with a tall shrubland layer, characterises the major intermittent watercourses and permanent waterholes on the main channels of the Cooper. Waterholes are mostly ephemeral and dry out or become highly saline during dry periods. River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*) woodland typically dominates around permanent waterholes. In some areas within the Finke bioregion, drainage lines also support Mulga (*Acacia aneura*). Grasses and ephemeral herbs grow densely after flooding.

Vegetation on swamps and depressions with frequent inundation and long retention times is commonly Swamp Cane-grass (*Eragrostis australasica*), with or without Lignum (*Muehlenbeckia florulenta*). Swamp Cane-grass is replaced by Samphire (*Halosarcia* spp.) in saline depressions. Where retention times are shorter, the usual perennial vegetation is open shrubland of Old Man Saltbush (*Atriplex nummularia* ssp. *nummularia*), Cottonbush (*Maireana aphylla*) and Queensland Bluebush (*Chenopodium auricomum*).

SIGNIFICANCE OF DRAINAGE LINES AND FLOOD PLAINS

In an arid sandy region generally dominated by sparse shrublands, the protection and breeding opportunities provided by the taller vegetation of the drainage areas are critical to the survival of many species that need the adjacent dunes for food, but are unable to breed there. The provision of water to the surrounding landscapes is central to the survival of all living things in this extremely dry environment. What survives and how they survive is determined by the amount, quality and availability of water for their breeding requirements. Species may need permanent fresh water for all or only a part of their lifecycle, or they may rely on the vegetation that grows in places only where water is more available.

Due to the hugely variable flows and inundation times for the flood plains and drainage lines, the range and complexity of available habitats is enormous, and many survival niches are provided for species that are poorly adapted to the dry sandy country.

Birdlife along watercourses is prolific. Many water birds, such as cormorants, herons and egrets, build stick nests next to lakes or wetlands. Often, these nests are built in branches overhanging open water. Hollows, particularly in River Red Gums, are important nesting sites for some ducks as well as raptors, reptiles and small mammals.

There has been one record in the bioregion of the vulnerable Plains Rat (*Pseudomys australis*) from the central Simpson Desert although its preferred habitat is cracking clay plains and gilgai habitats of the Stony Plains bioregion.

Threatened Ecological Communities

- Coolibah and River Red Gum woodland on regularly inundated flood plains
- Old-man Saltbush on flood plains
- Queensland Bluebush shrubland on cracking clay depressions subject to periodic waterlogging
- Willow Wattle and Coolibah woodland along drainage lines and on flood plains.

MAJOR VEGETATION COMMUNITIES

Woodland

River Red Gum (*Eucalyptus camaldulensis*) woodland over +/- Inland Paper-bark (*Melaleuca glomerata*) +/- Elegant Wattle (*Acacia victoriae*) +/- Broughton Willow (*Acacia salicina*), Ruby Saltbush (*Enchylaena tomentosa*), and Spiny Saltbush (*Rhagodia spinescens*) and ephemeral herbs along stream channels.

Coolibah (*Eucalyptus coolabah*), River Cooba (*Acacia stenophylla*) +/- Broughton Willow (*Acacia salicina*) +/- River Red Gum (*Eucalyptus camaldulensis*) low woodland over Lignum (*Muehlenbeckia florulenta*) and ephemeral herbs along stream channels.

Old Man Saltbush (*Atriplex nummularia* ssp. *nummularia*), Lignum (*Muehlenbeckia florulenta*) low open shrubland with emergent Coolabah (*Eucalyptus coolabah*), River Cooba (*Acacia stenophylla*) over Cottonbush (*Maireana aphylla*), Queensland Bluebush (*Chenopodium auricomum*), and Bindyi (*Sclerolaena* spp.) and ephemeral herbs in minor channels and flood-outs.

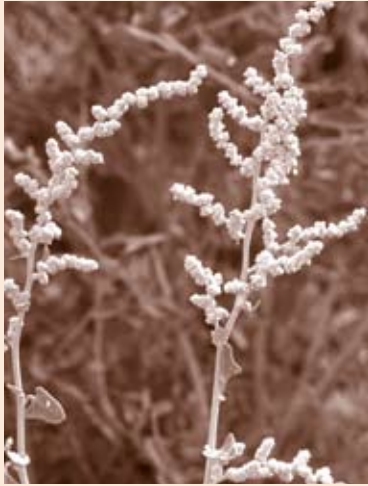
Shrubland

Cottonbush (*Maireana aphylla*) +/- Old Man Saltbush (*Atriplex nummularia* ssp. *nummularia*) +/- Bladder Saltbush (*Atriplex vesicaria*) low open shrubland over grasses and Bindyi (*Sclerolaena* spp.) on low-lying run-on areas.

Grassland

Swamp Canegrass (*Eragrostis australasica*) +/- Lignum (*Muehlenbeckia florulenta*) tall grassland over annual saltbushes (*Atriplex* spp.) +/- Bindyi (*Sclerolaena* spp.), and grasses and ephemeral herbs in non-saline swamps.



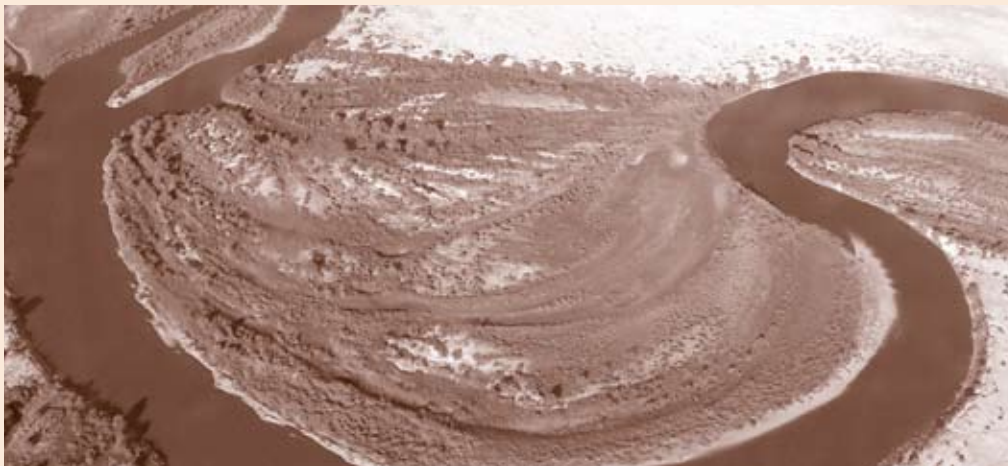


MANAGING THE BIODIVERSITY OF DRAINAGE LINES AND FLOOD PLAINS—PRACTICAL WAYS THAT LAND MANAGERS CAN HELP

The main driver of biological activity in the arid areas is water. When the amount or intensity of rainfall over the Sandy Deserts results in water run-off, surface water converges into drainage lines and, eventually, if the flows are large enough, onto flood plains. Flood events must be managed according to the origins of the rainfall. Local rain and subsequent flooding will provide grazing potential different from that of flood events triggered by rainfall away from the drainage lines and in the upper reaches of the catchment. Drainage lines

and flood plains are often the focus for pest plant species, camping and grazing pressure from native and introduced herbivores. These pressures contribute to the suppressed recruitment of perennial shrub and tree species, and have negative impacts on waterhole wildlife through increased quantities of pollutants and accelerated water use. Practical strategies that land managers can implement on drainage lines and flood plains to help retain the biodiversity of these areas include:

- Grazing intensity should be dependent on the type of flooding event. Local floods resulting from local rainfall will trigger a different vegetation response to flood events from rainfall in the upper catchment.
- After heavy rains, reduce total grazing pressure to enable recruiting or emerging perennial shrubs and trees to establish.
- Maximise vegetation cover to help slow water runoff and promote water infiltration after rains. This has other flow-on benefits including:
 - Increased vegetation cover assists water infiltration and nutrient cycling.
 - Greater infiltration of water into the soil increases plant growth.
 - Increased vegetation cover protects the soil from erosion and reduces sediment in runoff waters.
 - Lower flows along drainage lines are less likely to scour and erode banks of watercourses.
- Control feral herbivores and pest plants, in collaboration with neighbours and the SAAL NRM Board.





CONSERVATION PRIORITY:

Ecological Response to Water Flows in the Strzelecki Creek Wetland System

The Strzelecki Creek wetland system is identified as a wetland of national significance. It extends from the Cooper Creek in the Channel Country bioregion 200 km south to Lake Blanche, a shallow fresh water ephemeral lake connected to Lake Gregory in the north-west and Lake Callabonna in the south-east by overflow channels. This system represents an extreme example of ecological processes and adaptations within arid river systems in that it receives flows from the Cooper Creek only under extreme flood conditions.

Surface water flows are essential for many aquatic and terrestrial species to complete their lifecycles and disperse throughout the landscape. The size and duration of the water pulse through these systems determines the initiation, number and size of recruitment events and levels

of dispersal. The various phases of flooding and drying allow different types of water birds to feed and breed in the area at different times. When in flood, Lake Blanche, the terminus of the Strzelecki Creek, provides significant habitat for a large number of endemic and migratory water birds.

The Strzelecki Creek wetland system is one of Australia's most important raptor breeding areas, recognised nationally and internationally for its species richness and abundance of breeding raptor species. Wetlands of the Strzelecki Creek system are periodically inundated by major flows from the Cooper Creek and localised rainfall which cause the minor drainage systems to flow. The release of the Rabbit Haemorrhagic Disease (RHD) promoted significant regeneration along the Strzelecki Creek during the late 1990s. The reduction in rabbit numbers adversely impacted several raptor species, namely the Black Breasted Buzzard (*Hamirostra melanosternon*), Whistling Kite (*Haliastur sphenurus*) and Wedge-tailed Eagle (*Aquila audax*), because rabbits are their most preferred prey. Despite the potential significance of rabbits as prey for some raptor species, rabbits contribute significantly to total grazing pressure and land degradation, which impact on the density and abundance of native prey species.

Extraction and diversion of water from this system reduces the natural frequency and quantity of water these areas receive and store. Maintaining water flows is essential to conserving the unique vegetation communities and associated fauna along these ephemeral watercourses. The implementation of conservative stocking strategies and feral animal control programs will significantly improve the resilience of these systems, enabling vegetation and fauna communities to respond to even minor localised flows.

20-Year Target

Improvement of the ecological response to water flows within the Strzelecki Creek wetland system.

5-Year Performance Criteria

- Breeding success and diversity of raptor species.
- Recruitment success of preferred overstorey species.

5-Year Actions

- Establish criteria to define the Strzelecki Creek wetland system.
- Determine the ecological characteristics of the Strzelecki Creek wetland system.
- Map the area, location and persistence of the Strzelecki Creek wetland system.
- Determine the relationship between inundation frequency, prey species and raptor diversity and abundance along the Strzelecki Creek.
- Undertake an audit of infrastructure limiting, and with the potential to limit environmental flows in the Strzelecki Creek system.
- Reduce the impact of infrastructure on ecological flows in the Strzelecki Creek system.
- Improve the ecological productivity of the Strzelecki Creek wetland system and associated fauna through the integrated management of total grazing pressure and feral carnivore predation.



CONSERVATION PRIORITY:

Threatened Ecological Communities on Drainage Lines, Flood Plains and Swamps

Four threatened ecological communities occur on drainage lines, flood plains and swamps of the Simpson–Strzelecki Dunefields and Finke bioregions:

- Coolibah (*Eucalyptus coolabah*) and River Red Gum (*E. camaldulensis*) woodland on regularly inundated flood plains.
- Old-man Saltbush (*Atriplex nummularia*) on flood plains.
- Queensland Bluebush (*Chenopodium auricomum*) shrubland on cracking clay depressions subject to periodic waterlogging.
- Broughton Willow (*Acacia salicina*) and Coolibah (*Eucalyptus coolabah*) +/- Bauhinia (*Lysiphyllum gilvum*) woodland on drainage lines and flood plains.

Coolibah and River Red Gum woodland are represented in riverine environments in all bioregions of the far north of South Australia. The Old Man Saltbush and Queensland Bluebush shrubland occur in the Stony Plains and Channel Country bioregions, but are absent from the Finke bioregion, while the Broughton Willow and Coolibah woodland occurs only in the Simpson–Strzelecki Dunefields and Channel Country bioregions.



Photo: Coolibah *Eucalyptus coolabah* ssp. *arida*

The geographic distribution of these ecological communities has not been mapped in the Simpson–Strzelecki Dunefields and Finke bioregions. However, their presence is closely linked to moisture regimes determined by the frequency, duration and depth of flooding. Woodland communities occur along larger channels and are often associated along the Macumba, Warburton, and Cooper Creeks with Queensland Bluebush and Old Man Saltbush that form shrubland communities in swamps. Flows are more restricted in the Macumba River and Kallakoopah and Cooper Creeks in the Simpson–Strzelecki Dunefields bioregion, which means that regionally threatened ecosystems are less well-developed than in the more consistently fed Warburton Creek.

Historical pastoral use and uncontrolled grazing of feral herbivores has resulted in greater modification of the natural environment in the riverine habitats than in much of the surrounding higher ground. Alterations to natural water flows have, in some areas, contributed to a reduction in habitat quality, reduced recruitment of native species and altered plant community structure. The primary threat to these ecological communities is habitat modification associated with prolonged heavy grazing.

20-Year Target

The maintenance or improvement of the viability of threatened ecological communities on drainage lines, flood plains and swamps within the Sandy Deserts.

5-Year Performance Criteria

- Percentage of potential area occupied by threatened ecological communities on drainage lines, flood plains and swamps within IBRA subregions.
- Condition of individual occurrences of threatened ecological communities on drainage lines, flood plains and swamps within IBRA subregions.

5-Year Actions

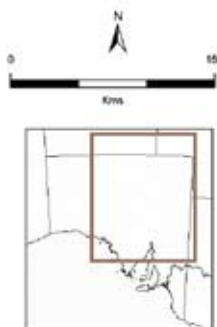
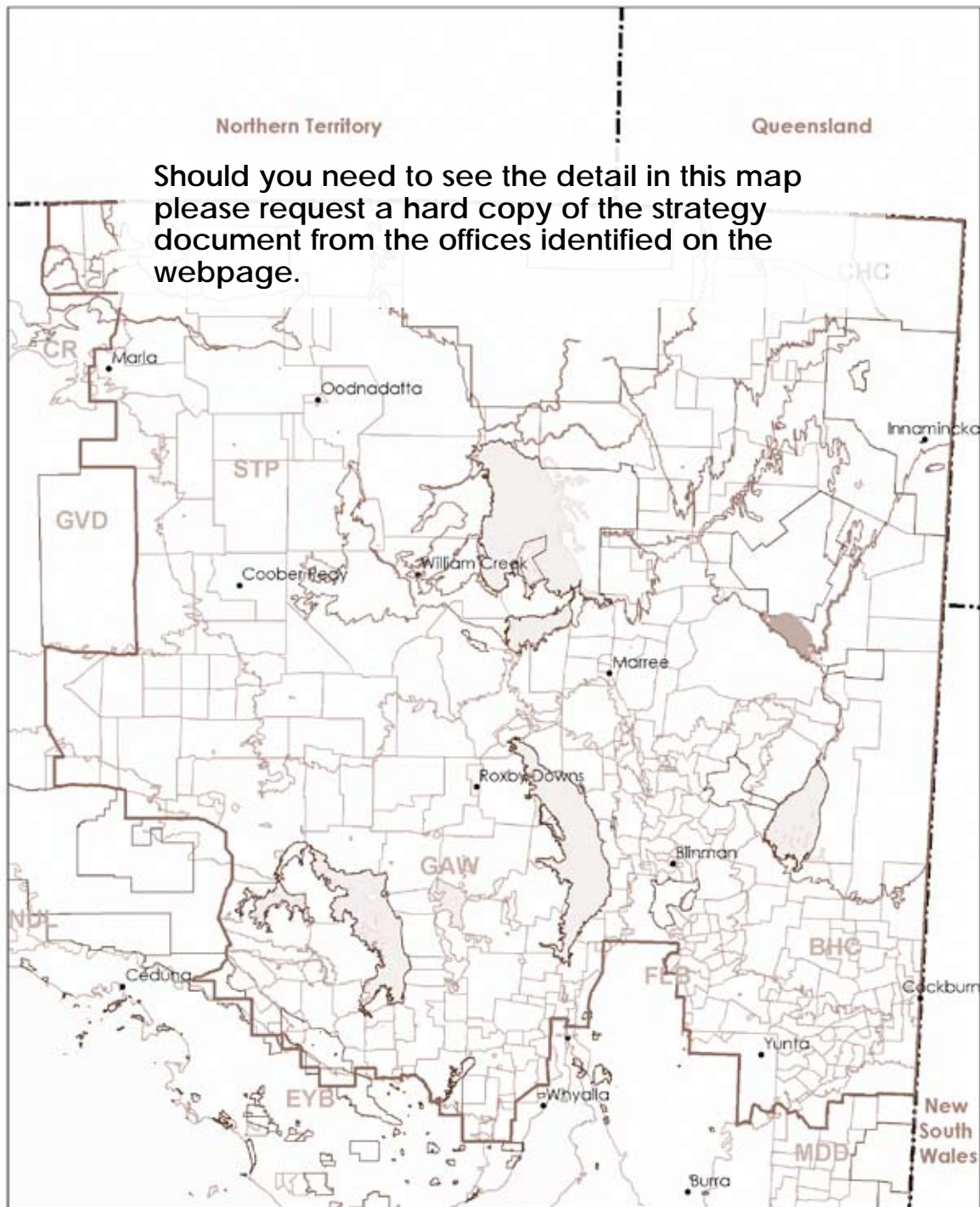
- Determine the current extent and condition of threatened ecological communities on drainage lines, flood plains and swamps within the Sandy Deserts, by IBRA subregion.
- Identify the potential area of occupancy of threatened ecological communities on drainage lines, flood plains and swamps in the Sandy Deserts, by IBRA subregion.
- Identify and, where possible, quantify the disruption, and sources of disruption, of key ecological processes supporting individual occurrences of threatened ecological communities on drainage lines, flood plains and swamps.
- Rank individual occurrences of threatened ecological communities on drainage lines, flood plains and swamps within IBRA subregions for viability, based on size, condition and landscape context.
- Develop and implement support mechanisms to assist land managers to improve threatened ecological communities on drainage lines, flood plains and swamps.



Photo: Hard Spinifex *Triodia basedowii*

Conservation Priorities for Drainage Lines and Flood Plains

Should you need to see the detail in this map please request a hard copy of the strategy document from the offices identified on the webpage.



Conservation Priorities

— Threatened ecological communities on floodplains and swamps

■ Ecological response of the Strzelecki Creek wetland system

Mapped conservation priorities provide an indication of the potential distribution

- Simpson Strzelecki Desert and Finke bioregions
- IBRA Bioregions outside of Simpson Strzelecki Desert and Finke
- South Australian Arid Lands NRM Region
- DEH Managed Area
- Pastoral Lease
- Salt Lake

SALT LAKES

There are two major salt lake systems in the Simpson–Strzelecki Dunefields bioregion. In the south-east is a series of interconnected salt lakes with channels, gypseous shorelines and plains, with gypsum dunes on the eastern margins, running from Lake Frome to Lake Blanche. In the central south is Lake Eyre.

The major landscape element is the salt lake beds themselves, with shores, shoreline dunes, lunettes, and saline deltas being less dominant. These lakes are unvegetated salinas with salt crusts. Vegetation is limited to the saline and gypseous shores, generally with low open perennial shrubland of Samphires (*Sclerostegia* spp./*Halosarcia* spp.) and Nitrebush (*Nitraria billardierei*). Ephemeral vegetation appears when rainfall is sufficient to leach some salt out of the surface soil and provide moisture for germination.

Fringing dunes are mobile, light-coloured gypseous sands. Where the gypsum content allows, Sandhill Wattle (*Acacia ligulata*) is present with an ephemeral understorey. Elsewhere, herbs and grasses provide temporary, sparse ephemeral cover.

Interdunes and some minor plains with more loamy soils have a sparse chenopod shrubland cover of Low Bluebush (*Maireana astrotricha*) and Bladder Saltbush (*Atriplex vesicaria*). More saline and heavier soils in interdunes may carry Samphire (*Halosarcia* spp./*Sclerostegia* spp.) and Nitrebush (*Nitraria billardierei*), while Lignum (*Muehlenbeckia florulenta*) grows in the poorly-drained run-on areas and pans with grey cracking clays.

Whilst dry, this landscape is extremely limited in its ability to provide shelter, food and nutrition for most wildlife but, when flooded, it becomes the focus for opportunistic breeding of many species and an attractive destination for a variety of migratory birds. Pelicans (*Pelecanus conspicillatus*), Silver Gulls (*Larus novaehollandiae*), Banded Stilts (*Cladorhynchus leucocephalus*) and various desert fishes are known to breed there in large numbers during major flood events that can take up to three years to dry out.

Prehistoric Life

There are some important vertebrate fossils in river and lake sediments that have provided some insight into the evolution of the landscapes in the region.

Lake Callabonna is where the first skeletons of the large marsupial Diprotodon, extinct for 15,000 years, were discovered in the late 19th century, and have very high palaeontological significance.

Diprotodon optatum, which evolved about a million years ago, was quite widespread throughout inland Australia prior to the last glacial peak about 18,000 years ago. Inland Australia was less arid then, and supported extensive grasslands. The last Ice Age brought increasingly dry conditions to the inland, and this may have brought on the extinction of the Diprotodon. Fossils

of Diprotodon and other animals are plentiful in the dry inland lakes of South Australia, and may be evidence that the last of the Diprotodons retreated into these lakes as they dried up.

Fossils of Eucalypts dating back to the Miocene epoch, 5 to 23 million years ago, are preserved in silcrete at Poole Creek and Stuart Creek, south of Lake Eyre. These fossilised plants are evidence that the vegetation was quite different from today's dry sandy desert conditions. Forests with plants now found in the wet subtropical and tropical areas co-existed with Eucalypts and Casuarinas when the Lake Eyre region had plains with large meandering rivers and probably a mosaic of forest and woodland ecosystems.

SIGNIFICANCE OF SALT LAKES

Lake Eyre and the inland saline lakes, including Lakes Callabonna, Frome and Torrens (Gawler bioregion), are recognised as wetlands of national significance, primarily for their importance to water birds. Lake Eyre is also significant in that it is the terminus of the world's largest internal drainage basin that occupies a sixth of Australia and a third of South Australia. The salt lakes are also important for the Lake Eyre Dragon (*Ctenophorus maculosus*), which is restricted to salt lakes in the SAAL region. An ostracod crustacean, *Diacypis* sp. is also thought to be endemic to Lake Eyre. At least 36 species of water birds occupy Lake Eyre and the other inland saline lakes in vast numbers during flooding, and several species breed into huge populations.

MAJOR VEGETATION COMMUNITIES

Shrubland

Nitrebush (*Nitraria billardierei*) low open shrubland over Twinleaves (*Zygophyllum* spp.) and ephemeral herbs on sandy, occasionally inundated areas of low salinity.

Nitrebush (*Nitraria billardierei*) +/- Black Bluebush (*Maireana pyramidata*) low open shrubland over Bindyi (*Sclerolaena obliquicuspis*), Wards Weed (*Carrichtera annua*) and Native Spinach (*Tetragonia eremaea/tetragonoides*) on run-on areas of low salinity.

Old Man Saltbush (*Atriplex nummularia* ssp. *nummularia*) open shrubland over Samphires (*Sclerostegia* spp./*Halosarcia* spp.), Bindyi (*Sclerolaena* spp.) and grasses with emergent Nitrebush (*Nitraria billardierei*) on minor drainage lines and saline run-on areas.

Samphire (*Halosarcia indica* ssp., *Halosarcia pergranulata* ssp.) and Pop Saltbush (*Atriplex holocarpa*) low open shrubland on saline flats.

Samphire (*Halosarcia* spp./*Sclerostegia* spp.) low open shrubland on saline flats.

Herbland

White Everlasting (*Rhodanthe floribunda*) +/- Soft Billy-buttons (*Pycnosorus pleiocephalus*) +/- grasses and Bindyi (*Sclerolaena* spp.) low ephemeral herbland on slightly saline clay loam plains fringing lakes.



MANAGING THE BIODIVERSITY OF SALT LAKES—PRACTICAL WAYS THAT LAND MANAGERS CAN HELP

Salt lakes are fragile ecosystems characterised by high salinities which form at the end of closed drainage systems in the flood-out area. All salt lakes in the South Australian arid lands contain water only episodically and have widely variable salinities. The potential biological impact of physical disturbance to dry salt lake beds is unknown, though any activity that affects the free movement of water across lakes can impact significantly upon the aesthetic appeal of these areas. Any activity on or around the fragile salt lake surface should be minimised or avoided.

Activities that disturb native vegetation within catchments lead to increased soil erosion, and sediment loads in waters entering salt lakes.

Following rainfall, run-off from overgrazed or cleared catchments may increase and has the potential to alter the natural hydrological pattern of salt lakes. There are a number of practical strategies that land managers can implement within the catchment to help retain the biodiversity of these areas and maintain these unique ecosystems:

- Maximise vegetation cover to help slow water runoff and promote water infiltration after rains. This has other flow-on benefits including:
 - Increased vegetation cover assists water infiltration and nutrient cycling.
 - Greater infiltration of water into the soil increases plant growth.
 - Increased vegetation cover protects the soil from erosion and reduces sediment in runoff waters.
 - Lower flows along drainage lines are less likely to scour and erode banks of watercourses.
- Control feral herbivores and pest plants, in collaboration with neighbours and the SAAL NRM Board.



CONSERVATION PRIORITY:

Significant Breeding Events on Inland Saline Lakes

The inland saline lakes in the Simpson–Strzelecki Dunefields bioregion include Lakes Frome, Callabonna and Eyre. When in flood, these saline lakes provide suitable habitat for over 40 wader species. Lake Frome receives water primarily from the Flinders Ranges, but exceptional flows in the Strzelecki Creek moving through Lakes Blanche and Callabonna may occasionally reach it. Lake Eyre receives water primarily from the Georgina and Diamantina River systems via the Warburton, Kallakoopah and Kalogeria Creeks. Water also enters Lake Eyre from the south and west via the Macumba, Neales, Anna, Warriner, Margaret, Frome and Clayton Creeks during exceptional rainfall. During major flood events, the Cooper Creek feeds it from the east.

Inland saline lakes are highly dynamic systems that, when inundated, become very productive and support breeding of over ten species. Species able to take advantage of these temporary wetland conditions include the Silver Gull (*Larus novaehollandiae*), Australian Pelican (*Pelecanus conspicillatus*), Caspian Tern (*Sterna caspia*), Red-necked Avocets (*Recurvirostra novaehollandiae*), Red-capped Plover (*Charadrius ruficapillus*), and Banded Stilt (*Cladorhynchus leucocephalus*).

The Banded Stilt is known to have bred in South Australia only 6 times in the past 70 years—at Lake Callabonna in 1930 and Lake Eyre North in 1984; on Stilt Island in Lake Torrens in 1989, Hughes Island in Lake Eyre North in 1997, Ibis Island in Lake Eyre North in 2000; and, in 2006, the Banded Stilt bred south on the increasingly saline Coorong. Lake Torrens in the Gawler bioregion also provides an important breeding site for the Banded Stilt.

Endemic to Australia, the Banded Stilt is common throughout coastal regions of southern Australia where there are suitable saline wetlands, including salt lakes, saltmarshes, saltfields and some coastal mud flats. It breeds only on inland salt lakes, and will fly long distances to breed opportunistically on large ephemeral salt lakes. Such breeding events occur irregularly and infrequently in response to rains and flooding sufficient to fill these inland lakes. It nests in large close-packed colonies on low islands within these lakes and feeds almost exclusively on the abundant brine shrimps *Parartemia* sp. and other related crustaceans. In 1989, there was a nesting colony of an estimated 100,000 banded stilts breeding on islands at the flooded Lake Torrens.

The most recent major water flow into Lake Eyre occurred in February 2000, following cyclonic rainfall in northern Australia. Water persisted in the lake for long enough to facilitate 4 breeding episodes within 6 months. About 18,000 pairs of Banded Stilts commenced nesting in late February. However, Silver Gulls (*Larus novaehollandiae*) heavily predated on Banded Stilt eggs and young and, by early April, no nests remained. Two flocks of immature birds (112 individuals) were the only observed evidence of fledged young from the first breeding episode. A second nesting in late May 2000 also failed when the nests were abandoned due to constant harassment of adults and predation of eggs and hatchlings by Silver Gulls.

A management program involving the baiting of Silver Gulls resulted in 3,000 breeding gulls being killed on Ibis Island during July. A further 1,000 gulls were displaced by human disturbance. During many hours of monitoring, there were no observations of any species other than Silver Gulls taking the baits. By late July, an estimated 40,000–50,000 Banded Stilt chicks were recruited into the population during late August and September. An aerial survey in late August estimated the total Banded Stilt population on Lake Eyre North at 100,000 birds.



Photo: Banded Stilt *Cladorhynchus leucocephalus* breeding colony



Banded Stilts live for an estimated 20 to 25 years which, for a bird of its size, is a relatively long lifespan. However large scale breeding events are driven by the infrequent filling of inland lakes and so, over its lifetime, a banded stilt may only have the opportunity to breed two or three times. The maintenance of a healthy population of Banded Stilts is very much dependent on achieving outstanding breeding success whenever the opportunity arises. The infrequent nature of reproduction events means that any failed attempts to breed may significantly impact upon the population's age structure and result in population collapse. The heavy predation by Silver Gulls represents the greatest threat to reproductive success of Banded Stilts.

20-Year Target

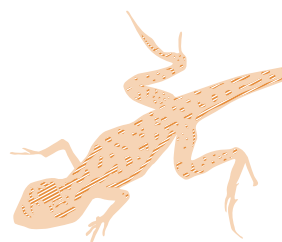
The maintenance or improvement of the success of significant breeding events on inland saline lakes.

5-Year Performance Criteria

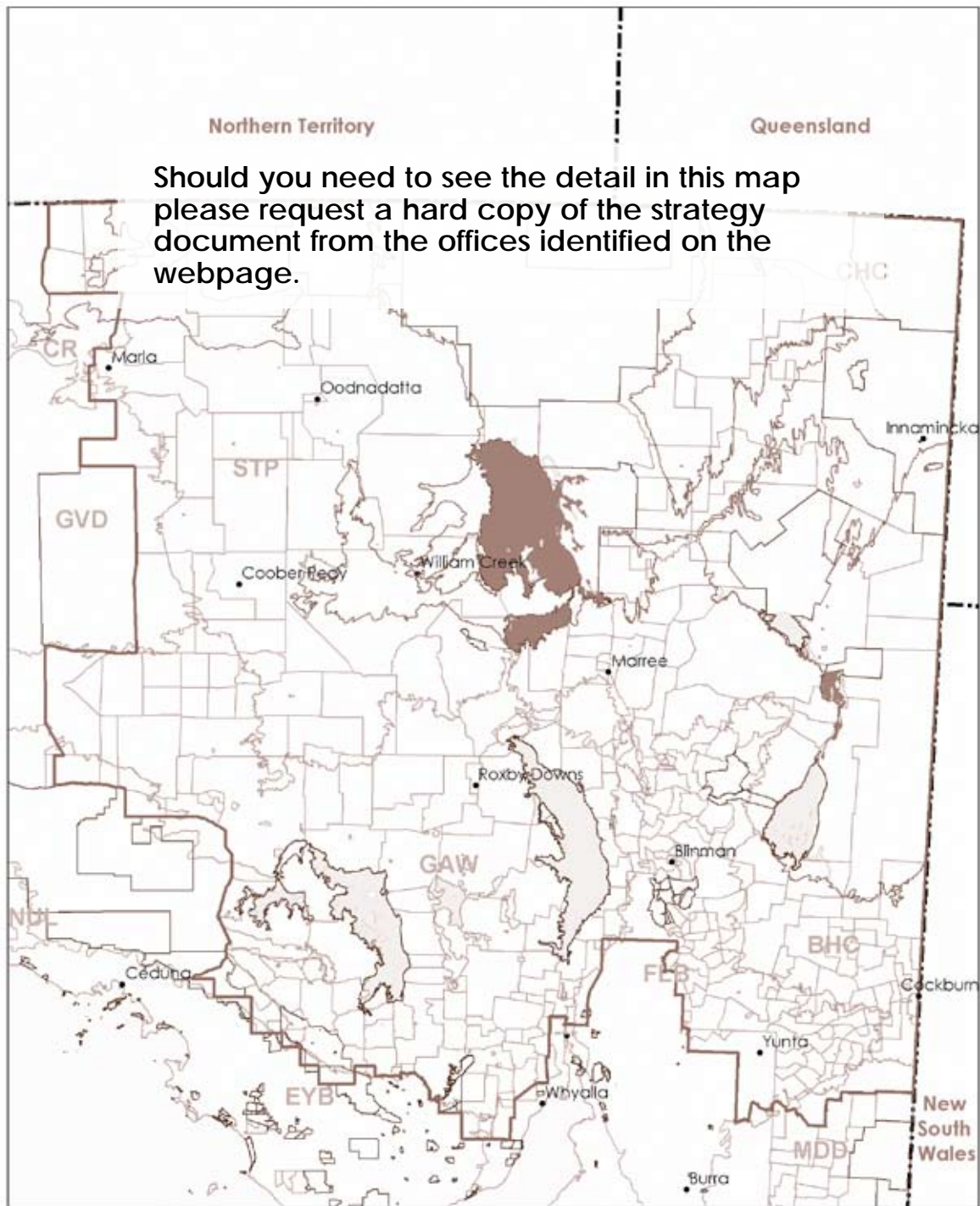
Nest abandonment of the Banded Stilt (*Cladorhynchus leucocephalus*) due to Silver Gull interaction during breeding episodes not exceeding 30%.

5-Year Actions

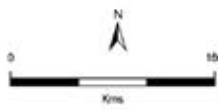
- Determine the non-breeding distribution and habitat of the Banded Stilt and evaluate relationship between breeding success and habitat occupancy.
- Identify the source populations of Silver Gulls and work with the relevant jurisdictions to implement gull management strategies.
- During breeding events, monitor interactions between breeding species and Silver Gulls and implement Silver Gull baiting program as required.
- Undertake audit of infrastructure limiting, and with the potential to limit, environmental flows into inland saline lakes.
- Reduce the impact of infrastructure on ecological flows into inland saline lakes.



Conservation Priorities for Salt Lakes



Should you need to see the detail in this map please request a hard copy of the strategy document from the offices identified on the webpage.



Conservation Priorities

Significant breeding events of the endemic Banded Stilt

- Simpson Strzelecki Desert and Finke bioregions
- IBRA Bioregions outside of Simpson Strzelecki Desert and Finke
- South Australian Arid Lands NRM Region
- DEH Managed Area
- Pastoral Lease
- Salt Lake

Mapped conservation priorities provide an indication of the potential distribution

GREAT ARTESIAN BASIN SPRINGS

The Great Artesian Basin springs (GAB springs) are high conservation value wetlands found on the margins of the Great Artesian Basin. There are approximately 1,500 springs in South Australia, ranging in size from a few square centimetres to hundreds of hectares in area. GAB springs have been active in the South Australian portion of the GAB for over 700,000 years and, as a result, contain a high proportion of relict fauna from when the region was significantly wetter. Due to isolation, these springs also contain a disproportionate number of endemic, relict and rare flora and fauna species.

SIGNIFICANCE OF GREAT ARTESIAN BASIN SPRINGS

Great Artesian Basin springs are characterised by a high proportion of endemic species. Due to the intrinsic dependence on GAB water by the organisms that live in the springs, all of these species are threatened with extinction by excessive water extraction. At present, there are 32 confirmed endemic species within the South Australian GAB springs. However, the number of organisms subjected to detailed taxonomic study in the springs is very low and this number is likely to increase as more taxonomic groups are examined. Because of their unique nature, all springs are listed as Threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

Springs come in a variety of geological forms, from large carbonate mounds to sandy seeps. Typical spring structure includes a vent (where water emerges from the ground), a tail (present only if water flow is great enough) which flows from the vent and terminates in the wetland around the base of the spring, and saline spring margins that often surround the spring.

Major Vegetation Communities

Bore drain Sedge (*Cyperus laevigatus*) +/- Pale Spike-rush (*Eleocharis pallens*) +/- Salt Pipewort (*Eriocaulon carsonii*) or Spiny Flat-sedge (*Cyperus gymnocaulos*) sedgeland around active vents.

Salt Pipewort (*Eriocaulon carsonii*) +/- Purple Bladderwort (*Utricularia dichotoma*) +/- Bore drain Sedge (*Cyperus laevigatus*) +/- Sea Rush (*Juncus kraussii*) aquatic sedgeland/herbland in and around active vents.

Acacia spp.; and Native Myrtle (*Myoporum acuminatum*) +/- Nitrebush (*Nitraria billardierei*) tall shrubland on inactive vents.

Bore drain Sedge (*Cyperus laevigatus*) +/- Samphires (*Halosarcia* spp.) sedgeland on spring tails.

Common Reed (*Phragmites australis*) +/- Bulrush (*Typha domingensis*) tall grassland on spring tails.

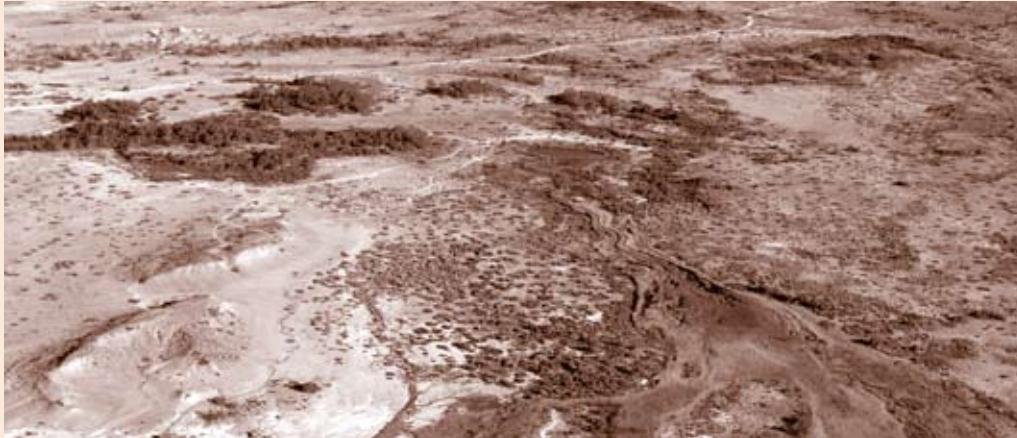
The springs in South Australia can be divided into a number of regions. At the local level, a series of individual vents form a grouping referred to as a spring group. These groups are then arranged into spring complexes and the complexes arranged into super groups. For adequate management at the level of this plan, super groups need to be subdivided into more relevant groupings based on catchment.

These groupings are:

- Dalhousie
- Neales River/Peake Creek
- Warriner Creek/Margaret Creek
- Lake Eyre South (not including Margaret Creek springs)
- Petermorra
- Lake Callabonna/Lake Frome

Nationally Threatened Ecological Communities

- All associated with Great Artesian Basin springs



MANAGING THE BIODIVERSITY OF GREAT ARTESIAN BASIN SPRINGS—PRACTICAL WAYS THAT LAND MANAGERS CAN HELP

In an arid landscape, water is a vital commodity. The GAB springs are islands of naturally occurring, largely permanent wetlands in an arid landscape and are extremely important for their biodiversity. Scientists working with GAB springs suggest that the key to managing them for biodiversity is to maintain a diversity of vegetation amongst springs within a spring group. The outflow channels and tails of GAB springs typically contain more significant plant and animal species than the spring vents. Excessive grazing can result in the vegetation of all springs in a group being pruned back to the ground, with reduced species and structural diversity. Excessive grazing also has other serious negative effects on spring ecology such as pugging, miring and mechanical destruction to the spring mounds, outflow channels and tails. There is, however, some evidence to suggest that spasmodic, low levels of grazing might help to improve the biological diversity of GAB springs. In the 1990s, a number of springs were fenced to exclude grazing in an attempt to protect them. Many of these became dominated by one plant species, the Common Reed (*Phragmites australis*), choking out other plants and reducing habitat variability. In spring groups that are lightly grazed, the Common Reed is preferentially grazed preventing it from dominating. Weed species, such as bamboo, date palms, Athel pine and others, all have the potential to degrade spring habitat by out competing spring flora, changing the volume and direction of water flows, and changing the physical and chemical properties of spring water and surrounding soil. Practical strategies that land managers can implement on GAB springs to help retain the biodiversity of these areas include:

- Wherever possible, avoid using GAB springs as regular livestock watering points.
- Where GAB springs are accessible to stock, manage numbers at low levels, and graze springs irregularly and for short periods to avoid overgrazing of spring vegetation, and to reduce the impacts of pugging and damage to mounds, vents and tails.
- Do not excavate, dam or redirect spring flows.
- Control feral herbivores and pest plants, in collaboration with neighbours and the SAAL NRM Board.

CONSERVATION PRIORITY:

Habitat Diversity of the Lake Callabonna–Lake Frome Great Artesian Basin Spring Complex

Two Great Artesian Basin spring complexes occur within the Simpson–Strzelecki Dunefields bioregion. The Lake Callabonna Spring Complex and Lake Frome Spring Complex have been combined into the Lake Callabonna–Lake Frome Great Artesian Basin Spring Complex, described at a catchment level, which represents the scale at which the movement of species between springs has most commonly occurred historically. The spring groups within this complex are associated with, or in proximity to, salt lakes and are recognised as being part of the Lake Frome spring super group.

Very little is known of this spring complex as only a few of the spring groups within the complex have been investigated. Further investigation to locate all spring vents and undertake a biological inventory is of high priority. By inference from better understood spring complexes, maintaining the diversity of habitats found within spring complexes will improve the ability of species to persist in the environment. The major threat to maintaining habitat diversity is a reduction in Great Artesian Basin pressure leading to the extinction of springs and loss of habitat diversity. Similarly, overgrazing by feral and domestic stock, colonisation by introduced plant species, localised tourism impacts, and changed fire regimes can reduce habitat and species diversity of spring complexes.

20-Year Target

The maintenance of habitat diversity through management of the Great Artesian Basin spring complexes.

5-Year Performance Criterion

Number of Great Artesian Basin spring complexes managed for habitat diversity.

5-Year Actions

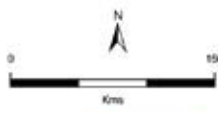
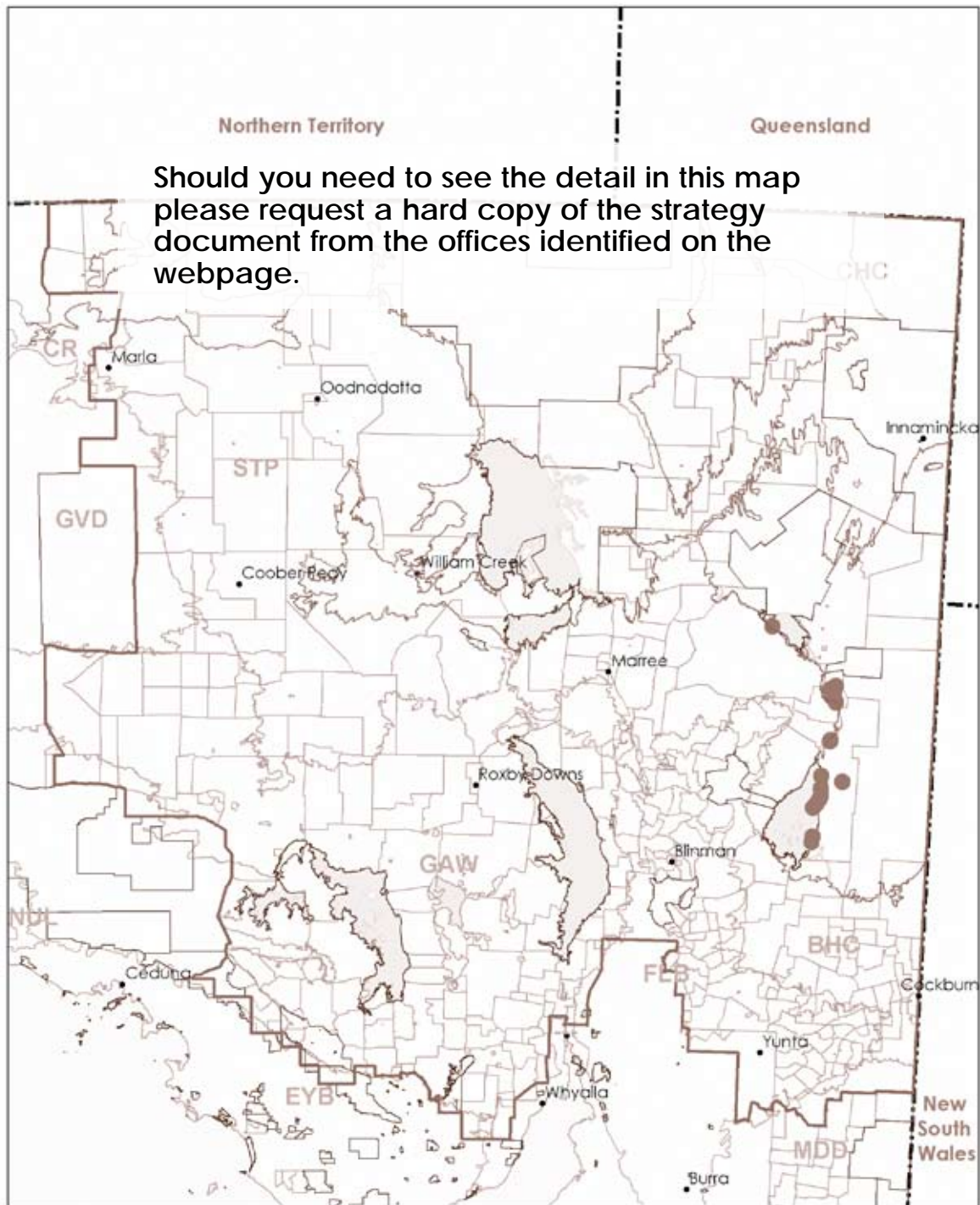
- Incorporate spring data into centralised data management system.
- Spatially locate all spring vents and collect elevation data and baseline biophysical and ecological data.
- Develop risk assessment model for South Australian GAB springs in response to aquifer alterations.
- Undertake spring threat assessment and prioritisation of on-ground threat mitigation works.
- Develop strategies for protection and management of Great Artesian Basin spring complexes, in conjunction with land managers.
- Provide information and support to individuals and organisations undertaking GAB spring-related projects.



Photo: Excavation of GAB Spring

Conservation Priorities for the Great Artesian Basin Springs

Should you need to see the detail in this map please request a hard copy of the strategy document from the offices identified on the webpage.



Conservation Priorities

● Habitat diversity of the Lake Callabonna - Lake Frome Great Artesian Basin Spring Complex

Mapped conservation priorities provide an indication of the potential distribution

- Simpson Strzelecki Desert and Finke bioregions
- IBRA Bioregions outside of Simpson Strzelecki Desert and Finke
- South Australian Arid Lands NRM Region
- DEH Managed Area
- Pastoral Lease
- Salt Lake

DUNEFIELDS AND SAND PLAINS

The major dunefields of the Simpson, Tirari and Strzelecki Deserts have an alternation of vegetation between the dunes and the interdune areas. Sandhill Wattle or Sandhill Cane-grass are the primary cover of dune crests in all three areas, and of the dune flanks in the Simpson and Tirari Deserts. In the very sparse understorey, herbs and grasses are abundant after rain. Dune flanks often support a very open tall shrubland, with Lobed Spinifex (*Triodia basedowii*) being more common on dune flanks in the Strzelecki Desert.

Further west, the sandy parts of the Finke bioregion (also comprising red parallel dunes and broad interdune corridors) are dominated by sparse Mulga (*Acacia aneura*) woodland over a variety of perennial shrubs, herbs and grasses.



Vegetation of interdune areas varies considerably and depends on the soil type, which is determined by the dune spacing. Closely spaced dunes have a sand layer covering the underlying heavier soil, and vegetation is similar to that of the dune flanks. Where dunes are widely spaced, gibber soils or flood plain soils may be exposed, and the vegetation is similar to that found elsewhere on those soil types. All variations between these two extremes exist. In low-lying, poorly-drained areas of some interdune areas, where water stands for long periods after rain, Swamp Cane-grass (*Eragrostis australasica*) or Lignum (*Muehlenbeckia florulenta*) swamps develop.

After rain, dunefields are transformed into a colourful garden with the opportunistic germination and flowering of many plants that are dormant during the dry times. The cycles of rainfall, drought and fire bring about a constantly changing community structure and composition in response to the changing environment.

Nationally Threatened Fauna

- Dusky Hopping-mouse (*Notomys fuscus*)
- Marsupial Mole (*Notoryctes typhlops*)

Threatened Ecological Communities

- Mulga low woodland on sand plains
- Needle Wattle on low dunes and sand plains

SIGNIFICANCE OF DUNEFIELDS AND SAND PLAINS

Although the dunes themselves do not generally support a high diversity or number of birds, the sandy deserts do have a few important species. The Eyrean Grasswren (*Amytornis goyderi*) occurs in Sandhill Cane-grass on dunes, as well as other bird species characteristic of chenopod shrublands. Few exotic birds have been able to colonise these bioregions.

The endangered Dusky Hopping-mouse (*Notomys fuscus*) has been recorded in sand dunes along the Strzelecki Creek. Since the introduction of cats and foxes, many small to medium sized mammals have become regionally extinct in the sandy deserts. They include the Pig-footed, Western Barred, Golden and Desert Bandicoots, the Lesser and Greater Stick-nest Rats, Brush-tailed and Burrowing Bettongs, the Desert Rat Kangaroo and the Bilby.

The dunefields also provide immense foraging areas for birds of prey, but few nesting places. Their proximity to major drainage lines that are able to provide this breeding habitat is critical to the survival of some species.



MAJOR VEGETATION COMMUNITIES

Woodland

Mulga (*Acacia aneura*) low open woodland over Common Bottle washers (*Enneapogon avenaceus*), Buckbush (*Salsola kali*) and Wild Turnip (*Brassica tournefortii*) on dunes and sandy plains.

Mulga (*Acacia aneura*) low open woodland over Sandhill Wattle (*Acacia ligulata*); Narrow-leaf Hop-bush (*Dodonaea viscosa* ssp. *angustissima*), Spiny Saltbush (*Rhagodia spinescens*), Buckbush (*Salsola kali*) and Lobed Spinifex (*Triodia basedowii*) and grasses on sandy plains and interdunes.

Mulga (*Acacia aneura*) low open woodland over Dead Finish (*Acacia tetragonophylla*), Rock Emubush (*Eremophila freelingii*), Crimson Emubush (*Eremophila latrobei*) and chenopods and grasses on sandy plains and interdunes.

Shrubland

Sandhill Wattle (*Acacia ligulata*); Elegant Wattle (*Acacia victoriae*), Gidgee (*Acacia cambagei*) +/- Narrow-leaf Hop-bush (*Dodonaea viscosa* ssp. *angustissima*) +/- Mulga (*Acacia aneura*) tall open shrubland over Cottonbush (*Maireana aphylla*), Bladder Saltbush (*Atriplex vesicaria*) and grasses and Bindyi (*Sclerolaena* spp.) on dunes.

Sandhill Wattle (*Acacia ligulata*) tall open shrubland over Wild Turnip (*Brassica tournefortii*), Buckbush (*Salsola kali*) and Poached-egg Daisy (*Polycalymma stuartii*) and annual grasses on dunes.

Low Bluebush (*Maireana astrotricha*) +/- Black Bluebush (*Maireana pyramidata*) +/- Bladder Saltbush (*Atriplex vesicaria*) low open shrubland over Bindyi (*Sclerolaena* spp.) and grasses on swales and interdune flats.

Bladder Saltbush (*Atriplex vesicaria*), Oodnadatta Saltbush (*Atriplex nummularia* ssp. *omissa*), Low Bluebush (*Maireana astrotricha*), Black Bluebush (*Maireana pyramidata*), Spiny Saltbush (*Rhagodia spinescens*) low open shrubland over Bindyi (*Sclerolaena* spp.) and grasses on swales and interdune flats.

Cottonbush (*Maireana aphylla*) +/- Old Man Saltbush (*Atriplex nummularia* ssp. *nummularia*) +/- Bladder Saltbush (*Atriplex vesicaria*) low open shrubland over grasses and Bindyi (*Sclerolaena* spp.) on poorly-drained run-on areas.

Bindyi (*Sclerolaena divaricata*), Desert Spinach (*Tetragonia eremaea*) very low open shrubland on swales and interdune flats.

Grassland

Sandhill Cane-grass (*Zygochloa paradoxa*), Desert Rattlepod (*Crotalaria eremaea*) +/- Spiny Saltbush (*Rhagodia spinescens*), +/- Lobed Spinifex (*Triodia basedowii*) tall open grassland with emergent Sandhill Wattle (*Acacia ligulata*) over Poached-egg Daisy (*Polycalymma stuartii*) and grasses on dunes.

Swamp Cane-grass (*Eragrostis australasica*) +/- Lignum (*Muehlenbeckia florulenta*) tall grassland over annual Saltbushes (*Atriplex* spp.) and grasses and Bindyi (*Sclerolaena* spp.) in interdune swamps.

MANAGING THE BIODIVERSITY OF DUNEFIELDS AND SAND PLAINS—PRACTICAL WAYS THAT LAND MANAGERS CAN HELP



Strategies that land managers can implement for managing the biodiversity of the dunefields and sand plains found in the sandy deserts focus largely on total grazing pressure management. Sandy areas are prone to the effects of wind erosion and, once an area begins to drift, the process of re-stabilisation can take considerable time. Recruitment of palatable perennial plants requires a series of rainfall events at just the right time to allow for flowering and seed set, seed germination and seedling establishment. These recruitment events occur very infrequently—for many species only once every 30 to 50 years. It is critical to carefully manage grazing pressure on dunefields and sand plains following these events to maximise the likelihood of successful recruitment of perennial plants. The various types of vegetation found in the dunefields and sand plains also provide valuable habitat for a wide range of native animals. Grazing pressure and potential weed infestations are a significant risk to these habitats. Practical strategies that land managers can implement on dunefields and sand plains to help retain the biodiversity of these areas include:



- Spell dune systems in dry times and do not restock immediately following a rainfall event. This is important for promoting the recovery of Sandhill Cane-grass, which is the dominant stabiliser of dune crests. Many dune swales with Queensland Bluebush and Cottonbush swamps also require spelling following prolonged dry spells. Rainfall events resulting in the filling of these swamps promote recovery and recruitment events for these habitats.
 - Avoid locating livestock watering points on or near areas that might be prone to drifting, such as dune crests. Wide open swales are preferable sites for water points to minimise livestock traffic across nearby dunes and encourage the movement of livestock out along the swales.
 - Ensure rehabilitation of borrow pits is carried out and prevent their use as alternative water sources.
 - Use conservative stocking strategies, in particular, the timely reduction in stock numbers with the onset of extended dry periods.
- Regularly spell these systems following major rainfall events.
 - Use targeted rabbit control in areas where recruitment of perennials has occurred to ensure seedlings are not pruned off.
 - Control feral herbivores and pest plants, in collaboration with neighbours and the SAAL NRM Board.

CONSERVATION PRIORITY:

Dusky Hopping-mouse in the Strzelecki Desert

The Dusky Hopping-mouse (*Notomys fuscus*) is restricted to the Strzelecki Desert subregion in the Simpson–Strzelecki Dunefields bioregion. Although once widely distributed in sandy areas, this species' range is now patchy in degraded dune and sand plains in the south-eastern Strzelecki Desert, east and south of the Strzelecki Creek. This species has also been recorded from isolated dunes south-east of the Diamantina River in south-west Queensland and in the Strzelecki Desert in New South Wales. An 8-year study on the ecology of this species, at Montecollina Bore, identified resource limitation as a major regulator of population size. Historical evidence suggests that removal of Sandhill Cane-grass (*Zygochloa paradoxa*) by rabbits and stock and replacement by short-lived perennial plants have significantly contributed to population decline at this site. There may also be dietary competition with rabbits and mice, the latter being able to respond more quickly to improved food availability than the Dusky Hopping-mouse. Despite this, the Dusky Hopping-mouse has been observed recolonising sites. Further survey effort is required to identify and map suitable areas of habitat and better understand the ecology of this species.



20-Year Target

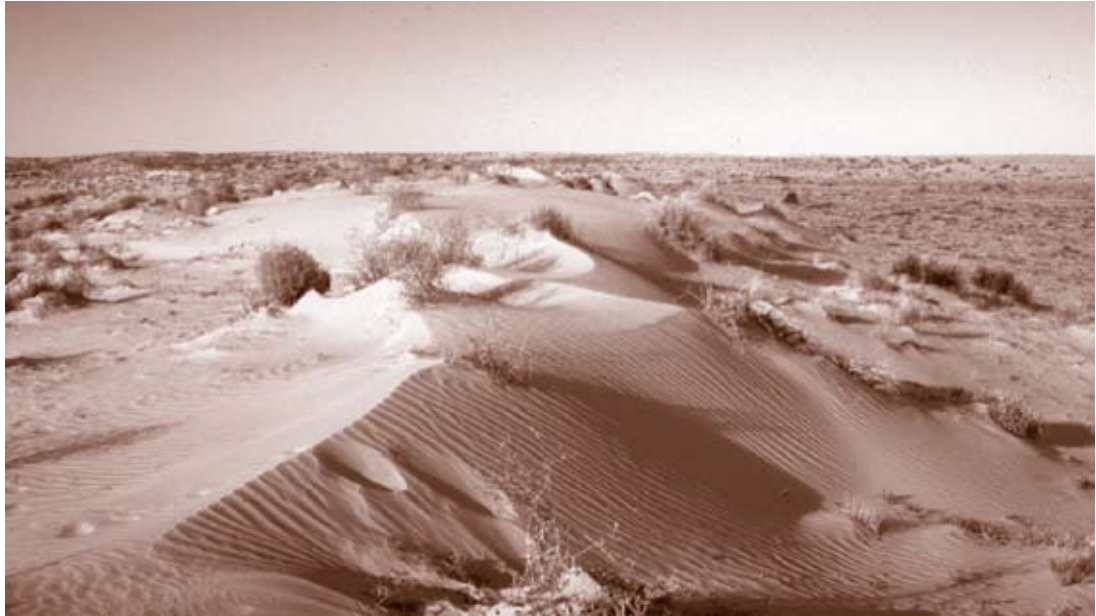
The maintenance or improvement of the viability of the Dusky Hopping-mouse in the Strzelecki Desert.

5-Year Performance Criteria

- Percentage of potential habitat occupied by the Dusky Hopping-mouse in the Strzelecki Desert.
- Number and viability of populations of the Dusky Hopping-mouse in the Strzelecki Desert.

5-Year Actions

- Determine area of occupancy and relationship between habitat and distribution and abundance of the Dusky Hopping-mouse in the Strzelecki Desert.
- Identify and, where possible, quantify the disruption, and sources of disruption, of key ecological processes supporting individual populations of the Dusky Hopping-mouse in the Strzelecki Desert.
- Identify potential habitats within the Strzelecki Desert for the Dusky Hopping-mouse.
- Rank populations of the Dusky Hopping-mouse within IBRA subregions for viability, based on size, threats and landscape context.
- Develop and implement support mechanisms to assist land managers to improve the viability of the Dusky Hopping-mouse by controlling feral animals and overabundant native herbivores, and promoting appropriate grazing practices.



CONSERVATION PRIORITY:

Marsupial Mole in the Simpson Desert and Finke Bioregion

The Marsupial Mole (*Notoryctes typhlops*) is a burrowing species that lives underground in sand dunes, interdunal flats and sandy soils on river flats often associated with Spinifex (*Triodia* spp.). Marsupial Moles come to the surface only occasionally, usually following rain. Occurring across the sandy deserts of central Western Australia, south-western Northern Territory and western South Australia, this species has been recorded only in the Gawler, Finke and Simpson–Strzelecki Dunefields bioregions in the SAAL region. In the Simpson–Strzelecki Dunefields bioregion, the Marsupial Mole has been recorded only in the Simpson Desert subregion. Very little is known of this species, and its ecology, distribution and any threatening processes are poorly understood. Further understanding of the distribution and ecology of this cryptic mammal remains a high priority.



20-Year Target

The maintenance or improvement of the viability of the Marsupial Mole in the Simpson Desert and Finke bioregions.

5-Year Performance Criteria

- Percentage of potential habitat occupied by the Marsupial Mole in the Simpson Desert and Finke bioregions.
- Number and viability of populations of the Marsupial Mole in the Simpson Desert and Finke bioregions.

5-Year Actions

- Determine area of occupancy and relationship between habitat and distribution and abundance of the Marsupial Mole in the Simpson Desert and Finke bioregions.
- Identify and, where possible, quantify the disruption, and sources of disruption, of key ecological processes supporting individual populations of the Marsupial Mole in the Simpson Desert and Finke bioregions.
- Review the status of the Marsupial Mole in the Simpson Desert and Finke bioregions against International Union for the Conservation of Nature threatened species criteria.



CONSERVATION PRIORITY:

Threatened Ecological Communities on Low Dunes and Sand Plains

Mulga (*Acacia aneura*) low woodland and Needle Wattle (*Acacia carneorum*) low woodland occur on low dunes and sand plains in the southern margins of the Strzelecki Desert subregion. Mulga low woodland also occurs in the Tingana landsystem at the northern extremity of the Strzelecki Desert subregion and on the few areas of sand plains in the Flinders and Olary, Broken Hill Complex, Channel Country, Stony Plains and Finke bioregions. In the Finke bioregion, this community is not considered to be threatened.

The distribution of Needle Wattle low woodland is mainly in the Broken Hill Complex bioregion, with isolated populations in the Olary Spur subregion of the Flinders Lofty Block bioregion, and in New South Wales between Broken Hill and Menindee and north towards Tibooburra. Needle Wattle is nationally threatened, and grows primarily on sandy plains or on alluvial soils along watercourses, and is often the dominant vegetation form. It reproduces vegetatively and often grows in colonies of 20–60 plants. As a result, this ecological community generally is a component of other vegetation communities such as open grasslands and shrublands, and open low woodlands on sandy plains.

Both ecological communities are primarily threatened by inhibited regeneration due to excessive total grazing pressure. Rabbits are the most significant component of total grazing pressure as they favour this sandy habitat. Rabbits burrowing in these communities may cause sheet erosion, which can be exacerbated by stock if close to watering points. Anecdotal evidence suggests that the reduction in rabbit numbers from RHD has allowed increased recruitment of these ecological communities. However, the extent and significance of this improvement is unknown.

20-Year Target

The maintenance or improvement of the viability of Mulga and Needle Wattle low woodlands on low dunes and sand plains within the Strzelecki Desert.

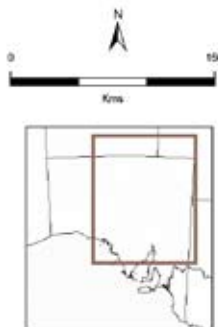
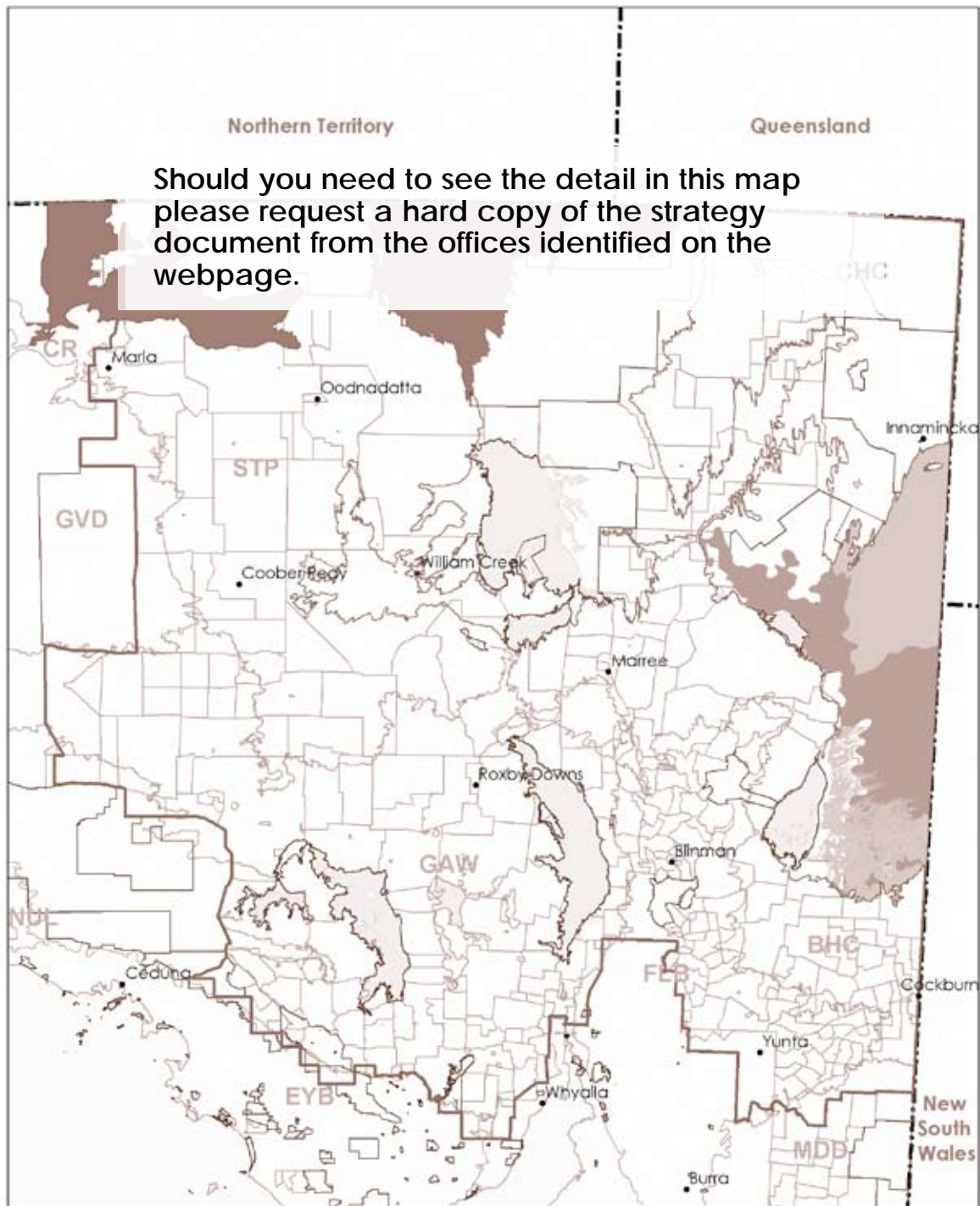
5-Year Performance Criteria

- Percentage of potential area occupied by Mulga and Needle Wattle low woodlands on low dunes and sand plains within IBRA subregions.
- Condition of individual occurrences of Mulga and Needle Wattle low woodlands on low dunes and sand plains within IBRA subregions.

5-Year Actions

- Determine the current extent and condition of Mulga and Needle Wattle low woodlands on low dunes and sand plains within the Strzelecki Desert.
- Identify the potential area of occupancy of Mulga and Needle Wattle low woodlands on low dunes and sand plains within the Strzelecki Desert.
- Identify and, where possible, quantify the disruption, and sources of disruption, of key ecological processes supporting individual occurrences of Mulga and Needle Wattle low woodlands on low dunes and sand plains.
- Rank individual occurrences of Mulga and Needle Wattle low woodlands on low dunes and sand plains within IBRA subregions for viability, based on size, condition and landscape context.
- Develop and implement support mechanisms to assist land managers to improve Mulga and Needle Wattle low woodlands on low dunes and sand plains.

Conservation Priorities for Dunefields and Sand Plains



Conservation Priorities

- Threatened Dusky Hopping-mouse in the Strzelecki Desert
- Threatened Marsupial Mole in the Simpson Desert and the Finke bioregion
- Threatened ecological communities on low dunes and sand plains

Mapped conservation priorities provide an indication of the potential distribution

- Simpson Strzelecki Desert and Finke bioregions
- IBRA Bioregions outside of Simpson Strzelecki Desert and Finke
- South Australian Arid Lands NRM Region
- DEH Managed Area
- Pastoral Lease
- Salt Lake

MONITORING AND EVALUATION

The Sandy Deserts Conservation Priorities aims to facilitate conservation actions across both the Simpson-Strzelecki Dunefield and Finke bioregions. The SAAL NRM Board and support partners will coordinate and support the delivery of these actions, guided by statutory mechanisms. The SAAL NRM Board will monitor and report on the implementation of the Sandy Deserts Conservation Priorities.

Both the SAAL NRM Board and the Department for Environment and Heritage are jointly responsible for evaluating the effectiveness of this plan which contributes to the SAAL NRM Plan and No Species Loss – A Nature Conservation Strategy for South Australia.

DEH will produce a public report on overall progress towards the conservation priorities as part of the five year review and evaluation of the South Australian Arid Lands Biodiversity Strategy in 2012.

MONITORING AND REPORTING CRITERIA

Land Form	Priority	Targets	Performance Criteria
Drainage Lines and Flood Plains	Ecological response to water flows in the Strzelecki Creek Wetland System	Improvement of the ecological response to water flows within the Strzelecki Creek wetland system.	<ul style="list-style-type: none"> Breeding success and diversity of raptor species. Recruitment success of preferred overstorey species.
	Threatened ecological communities on drainage lines, flood plains and swamps	The maintenance or improvement of the viability of threatened ecological communities on drainage lines, flood plains and swamps within the Sandy Deserts.	<ul style="list-style-type: none"> Percentage of potential area occupied by threatened ecological communities on drainage lines, flood plains and swamps within IBRA subregions. Condition of individual occurrences of threatened ecological communities on drainage lines, flood plains and swamps within IBRA subregions.
Salt Lakes	Significant breeding events on inland saline lakes	The maintenance or improvement of the success of significant breeding events on inland saline lakes.	<ul style="list-style-type: none"> Nest abandonment of the Banded Stilt (<i>Cladorhynchus leucocephalus</i>) due to Silver Gull interaction during breeding episodes not exceeding 30%.
Great Artesian Basin Springs	Habitat diversity of the Lake Callabonna–Lake Frome Great Artesian Basin spring complex	The maintenance of habitat diversity through management of the Great Artesian Basin spring complexes.	<ul style="list-style-type: none"> Number of Great Artesian Basin spring complexes managed for habitat diversity.

Land Form	Priority	Targets	Performance Criteria
Dunefields and Sand Plains	Dusky Hopping-mouse in the Strzelecki Desert	The maintenance or improvement of the viability of the Dusky Hopping-mouse in the Strzelecki Desert.	<ul style="list-style-type: none"> Percentage of potential habitat occupied by the Dusky Hopping-mouse in the Strzelecki Desert. Number and viability of populations of the Dusky Hopping-mouse in the Strzelecki Desert.
	Marsupial Mole in the Simpson Desert and Finke bioregion	The maintenance or improvement of the viability of the Marsupial Mole in the Simpson Desert and Finke bioregions.	<ul style="list-style-type: none"> Percentage of potential habitat occupied by the Marsupial Mole in the Simpson Desert and Finke bioregions. Number and viability of populations of the Marsupial Mole in the Simpson Desert and Finke bioregions.
	Threatened ecological communities on low dunes and sand plains	The maintenance or improvement of the viability of Mulga and Needle Wattle low woodlands on low dunes and sand plains within the Strzelecki Desert.	<ul style="list-style-type: none"> Percentage of potential area occupied by Mulga and Needle Wattle low woodlands on low dunes and sand plains within IBRA subregions. Condition of individual occurrences of Mulga and Needle Wattle low woodlands on low dunes and sand plains within IBRA subregions.





GLOSSARY

Arid: Refers to climates or regions that lack sufficient crop production or extensive sown pastures. Usually defined as a climate with annual average rainfall less than 250 mm (10 inches).

Biodiversity: The variety of life forms: the different plants, animals and micro-organisms; the genes they contain; and the ecosystems they form.

Bioregion: Extensive (continental scale) regions distinguished from adjacent regions by their broad physical and biological characteristics.

Conservation: The protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment.

Degradation: The decline in the quality of the natural resources of the land resulting from human activities on the land.

Dispersal: The movement of organisms between locations, especially relating to the movement from birth site or breeding sites.

Ecological Community: A characteristic suite of interacting species that are adapted to particular conditions of soil, topography, water availability and climate.

Ecological Processes: Dynamic interactions that occur among and between biotic (living) and abiotic (non-living) components of the environment.

Ecosystem: A dynamic complex of plant, animal, fungal and micro-organism communities and the associated non-living environment, interacting as an ecological unit.

Endemic: Exclusively native to a specified region or site.

Ephemeral Watercourses: Temporary watercourses that flow for only short periods of time after substantial rainfall events.

Feral: A domesticated species that has escaped the ownership, management and control of people and is living and reproducing in the wild.

Fire Regime: The intensity, frequency and extent of fire.

Gypcrete: A hard surface crust composed of calcium sulphate.

Habitat: The physical place or type of site where an organism, species or population naturally occurs together with the characteristics and conditions that render the site suitable to meet the lifecycle needs of that organism, species or population.

Habitat Diversity: The number of different types of habitats within a given area.

IBRA Regions: Interim Biogeographic Regionalisation for Australia regions.

IBRA Subregion: A subdivision of a bioregion based on broad physical and biological characteristics; a system of related and interconnected landsystems within an IBRA region.

Indicator: A measure against which some aspects of performance can be assessed.

Invasive Species: Any animal pest, weed or disease that can adversely affect native species and ecosystems.

Inselberg: A rocky mass that has resisted erosion and stands isolated in an essentially level area.

Landform: Any of the numerous features that make up the surface of the earth, such as plain, plateau and canyon.

Landscape: A heterogeneous area of land or sea that is of sufficient size to achieve positive results in the recovery of species or ecological communities, or in the protection and enhancement of ecological and evolutionary processes.

Landsystem: A group of local ecological communities derived from a landscape pattern of related and interconnected local ecosystems within a subregion.

Lunettes: Broad, low lying typically crescent-shaped mounds of sandy or loamy matter that is formed by the wind, especially along the windward side of a lake basin.

Mesa: An isolated, nearly level landmass standing distinctly above the surrounding country, bounded by abrupt or steeply sloping erosion scarps, and capped by a layer of resistant, nearly horizontal rock.

Native Species: A plant or animal species that occurs naturally in South Australia.

Playa: A vary flat, dry lake bed of hard, mud cracked clay.

Refuge or Refugia: A region, or habitat, where organisms are able to persist during a period in which most of the original geographic range becomes uninhabitable.

Salinas: Very flat, dry lake beds of hard, mud-cracked clay with salt; a salt marsh, salt lake, or the like.

Species: A group of organisms capable of interbreeding with each other but not with members of other species.

Species Diversity: Variability (richness and abundance) of biota in an area. An index of community diversity that takes into account both species richness and the relative abundance of species.

Tableland: An elevated and generally level region of considerable extent.

Terrestrial: Land-based biodiversity including inland aquatic ecosystems, such as rivers, streams, lakes, wetlands, springs, groundwater and groundwater dependent ecosystems, and the native inland aquatic species in these areas.

Threatened Species and/or Ecological Communities: A species or ecological community that is vulnerable or endangered.

Vegetation Condition: Refers to the condition, composition and density of the plants in an area.

Viability: The likelihood of long-term survival of the example/population of a particular ecosystem or species.

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Photo: Simpson Desert Wildflowers

Department for Environment and Heritage (2008)
South Australian Arid Lands Biodiversity Strategy -
Sandy Desert Conservation Priorities, South Australian
Arid Lands NRM Board, Department for Environment
and Heritage.

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