



Anvil Beach, Denmark
PHOTO: Craig Carter

A blue-tinted photograph of a coastal landscape. In the foreground, there is a large, dark, curved shape that resembles a stylized letter 'C' or a thick brushstroke. The background shows a body of water with gentle ripples, a distant shoreline with trees, and a clear sky. A thin, dark line with a small, dark, circular object at its end extends from the top left towards the center of the image.

SOUTHERN PROSPECTS 2011-2016

Regional Overview

REGIONAL OVERVIEW

The South Coast NRM Region of WA (Map 1) covers a land area of more than 8.6 million hectares and extends to the three nautical mile limit which includes approximately one million hectares of State waters. Due to the location of numerous islands, State waters extend up to 70 kilometres off shore, especially to the east of Esperance. It includes the catchments of all the southerly-flowing rivers from Walpole in the west to beyond Cape Arid in the east, as well as some internally drained areas north east of Albany and north of Esperance.

The South Coast NRM area is a natural geographic region which began to form 100 million years ago when Antarctica broke away from Australia. Since then, new rivers have been draining to the Southern Ocean, creating a series of catchments with unique soils and landforms. During the Eocene period about 60 million years ago, the ocean covered much of the South Coast region leaving behind up to 50 metres of silty sediments. At this time most, if not all, of the current mountain peaks were isolated islands where unique flora evolved.

Today, it is the unique biological and landscape features and significant cultural and pioneering heritage, which make the South Coast region one of the most spectacular in Australia.

The first human occupants of the South Coast were the Noongars (the collective name for the Aboriginal people of the south west corner of WA). Their lands extended to the west of a line drawn from Jurien Bay on the west coast of WA to Esperance on the South Coast (Bates, 1966). Noongars were divided into 13 different socio-linguistic groups, each with access to different ecological habitats in accordance with a long tradition of territorial occupation (Department of Conservation and Land Management, 2002). The South Coast NRM Region encompasses five of the 13 socio-linguistic groups including Kaneang, Minang, Koren, Wudjari and Njunga (Figure 1).

The Aboriginal 'Dreaming' is commonly used to describe the Aboriginal creative epoch (Edwards,

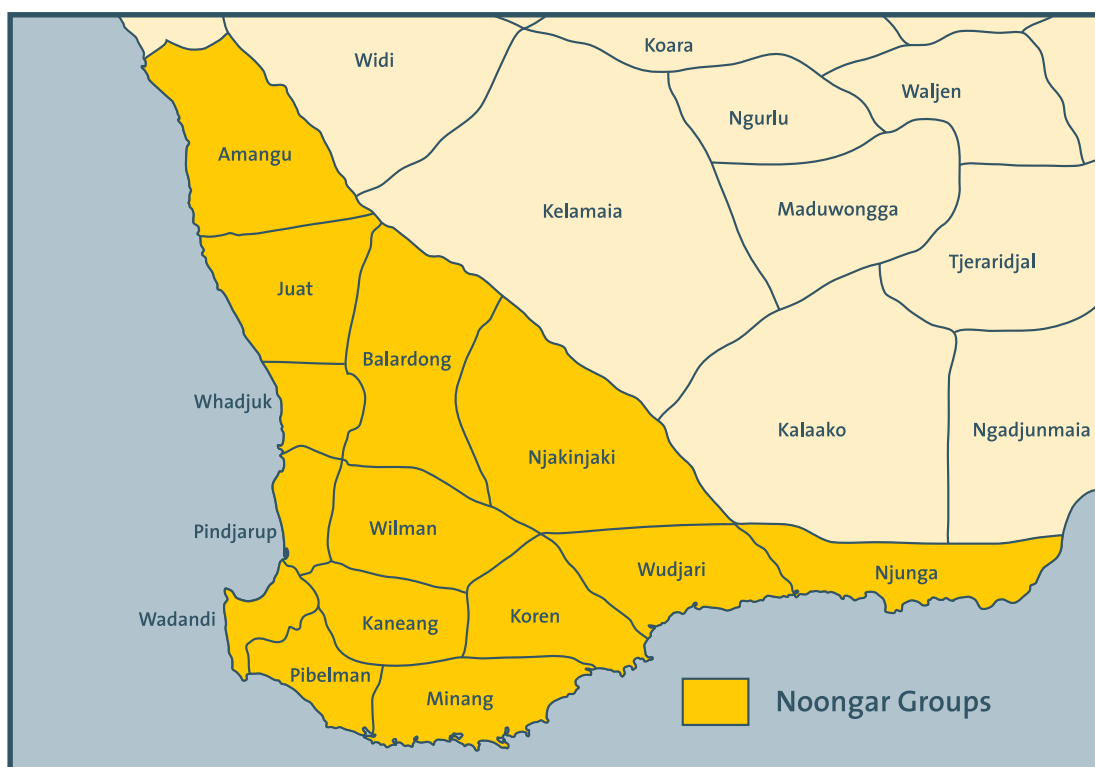


Figure 1: Aboriginal Groups of the South West of Western Australia.

(After Tindale, 1974. Source: Department of Indigenous Affairs, 2010)

1998). Dreaming stories explain how ancestral beings emerged at the beginning of time to create the earth and all things within it. These stories illustrated complex relationships between the people, the land and the animals. Through these relationships the past is drawn into the present, where it continues to transform itself (Noongar, 2003, Citizens and Civics Unit, Department of Indigenous Affairs, Aboriginal and Torres Strait Islander Commission, 2004). The Dreaming illustrates relationships and provides a guide 'for respect and utilisation of resources in a sustainable way' (Noongar, 2003).

The Dreaming stories remind us that the human relationship with the area we now call the South Coast NRM Region dates back tens of thousands of years, and that a vast knowledge of country was gathered over that time.

European settlement of the region commenced in 1827 with settlement of Albany. Farming was initially not very successful due to a lack of understanding of mineral deficiencies in the soil and the presence of plants poisonous to stock. Trade and whaling offered some support to the fledgling settlement. Areas around Esperance were opened for grazing in 1863 with a rise to prominence of Esperance as a commercial port when the Kalgoorlie gold rush of the 1890s occurred. Farming success increased in 1949 when soils deficient in phosphorus, copper and zinc were treated with superphosphate and trace elements. It is at this stage that large tracts of land were cleared for farming with the Australian and State Government advocating the clearing of one million acres a year during the 1960s (Saunders & Rijavec, undated).

Agricultural landscapes make up around 70% of the region, and there is a strong economic reliance within the regional community on agricultural production and related service industries. Increasingly, areas of plantation and farm forestry are changing parts of the landscape. There are some strong trends in parts of the region to increase the diversity and resilience of land management systems both in agriculture and forestry. The agricultural landscape particularly reflects the climate of the region, and rainfall in particular (Map 2).

The South Coast region is renowned for its spectacular landscapes, including tall forest areas in the west, the southern coastline and many offshore islands, all of southern WA's mountain peaks, and many inlets, estuaries, waterways and wetlands. It has extremely high levels of biodiversity, with

more than 20% of the State's floristic diversity within the region, and numerous threatened flora and fauna species. The South Coast NRM Region is internationally recognised as being part of one of the world's 34 biodiversity 'hotspots' (Myers et al., 2000). Some of the most significant areas are contained in the network of conservation reserves including iconic areas such as the Fitzgerald River and Stirling Range National Parks and the Two Peoples Bay Nature Reserve.

The spectacular scenery of the southern coastline with sweeping white beaches, granite headlands and vegetated coastal inlets gives the region a strong sense of place. The coast is an important natural feature of the South Coast NRM Region. Coastal settlements are experiencing rapid change with the "sea change" population settlement phenomenon and increasing numbers of local and international tourists to the region. The coastal and marine environments contain much of the region's ecologically intact ecosystems, and more than 70% of the coastal vegetation corridor is currently under some form of conservation management. The coastal inlets are a highly valued aspect of the South Coast lifestyle experience, both for residential settlement and recreation.

The South Coast NRM Region has several fishing industries, with the catch including a range of species such as crab, lobster, abalone, scallop, cobbler, whiting, sea mullet, herring, bream, salmon, pilchard and shark. There is also a commercial fishery operating in various estuaries of the region.

The South Coast NRM Region is not a large mineral producer, although there is the potential for significant nickel production in the Ravensthorpe area and haematite (iron) production in the Wellstead area. Some mines extract lithium, tantalum and other materials. Basic raw materials including agricultural lime, gypsum, dolomite, silica sand, spongolite and gravel are significant resources and extracted at a small scale but from many parts of the region.

The South Coast NRM Region includes the following local government areas: Shires of Denmark, Plantagenet, Cranbrook, Broomehill-Tambellup, Gnowangerup, Jerramungup, Ravensthorpe and Esperance, and parts of the Kojonup, Manjimup, Lake Grace and Kent Shires. The region also includes the City of Albany.

The local government areas that form the region have varying levels of involvement with natural

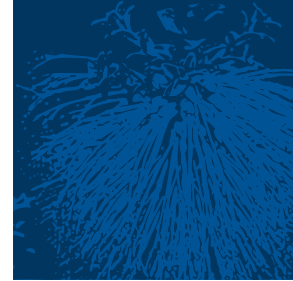




PHOTO: Jenelle Carter

Many inlets, waterways and estuaries have high levels of biodiversity.

resource management according to their ratepayer demands and resource capabilities. For most, their involvement is strongest at a sub-regional or local level, and includes some administrative or funding support for the employment of NRM officers or for the direct support or management of priority projects in their areas. The Shire of Denmark and City of Albany have been active players in the identification and management of regionally and locally significant vegetation in their areas. The Shires of Jerramungup, Cranbrook and Gnowangerup have a long history of involvement with many aspects of NRM and continue to strongly support the Fitzgerald Biosphere Group, Gillamii Centre and North Stirlings Pallinup Natural Resources Inc., respectively. The coastal authorities (City of Albany and Shires of Denmark, Jerramungup, Ravensthorpe and Esperance) were instrumental in the development of Southern Shores (Coffey Environments & South Coast Management Group, 2009), the strategy for management of the coastal zone of the region.

Most local governments have indicated willingness to increase their involvement at both regional and sub-regional levels, but need both financial and technical support to achieve this goal. Most of the Local Government Authorities have large areas to support with only a small rate base (Table 1).

Approximately 67% (45,782) of the 67,827 people in the South Coast NRM Region (Australian Bureau of Statistics, 2006a) live in relatively urban areas such as Esperance, Denmark and Mount Barker and Albany. This means that approximately a third of the people in the region live on farms or in small rural towns. Some inland towns have low but stable

populations (Cranbrook and Broomehill - Tambellup) or declining populations (Gnowangerup and Jerramungup) while the populations of the towns of Mount Barker, Denmark, Albany and Esperance are increasing. Ravensthorpe and Hopetoun experienced high growth around 2006-2007 with the opening of the Ravensthorpe Nickel Operation. Although most of this population left when the mine closed in 2009, reopening of the mine in 2010 is likely to see numbers increase again.

The South Coast region, made up of Lower Great Southern, Upper Great Southern and South Eastern statistical divisions (Australian Bureau of Statistics, 2011), has experienced growth of 1.0%, -0.3% and 0.6% respectively between 2009 and 2010.

Compared with the rest of the State, the South Coast region has more young children and older people but fewer people between 16 and 64 years of age than the State average (Australian Bureau of Statistics, 2006a). This could reflect people leaving the region to gain education and employment opportunities, and older people moving to the region to retire.

There are approximately 1,854 Aboriginal people in the region (Australian Bureau of Statistics, 2006b), compared to 1,741 in 2001.

About 17% of the workforce in the region is directly employed in agriculture, forestry and fisheries (Australian Bureau of Statistics, 2006b). A number of employees in other sectors depend indirectly on agriculture, and businesses in towns in the region report that buying patterns are directly related to seasonal conditions and commodity prices.

Table 1: Population Change in South Coast Regional Centres

Local Government Authority	Local Government Area (ha)	Population 1996	Population 2001	Population 2009	% Population Change 2001 - 2009	Population: Urban %	Population: Rural %	Population: Township / Semi Rural %
Albany	431,177	28,148	31,236	35,550	1.9	84	14.8	1
Broomehill - Tambellup	260,839	505	523	1,282	1.1	-	73.8	26.2
Cranbrook	327,612	1,159	1,068	1,144	0.2	-	73.7	26.3
Denmark	155,999	3,891	4,715	5,322	2.0	60.5	26.4	-
Esperance	4,252,872	12,300	13,315	14,553	1.3	73.6	26.4	-
Gnowangerup	426,699	1,803	1,579	1,393	-1.1	-	54.2	45.8
Jerramungup	650,656	1,332	1,244	1,162	-1.1	-	54.7	45.3
Plantagenet	487,464	4,292	4,688	5,064	1.8	39.3	60.7	-
Ravensthorpe	1,354,488	1,433	1,504	2,402	8.7	-	47.7	52.3
TOTAL FOR REGION		54,863	59,872	67,872				

(Source: Australian Bureau of Statistics. Estimated Residential Population 1996, 2001 and 2009, Census 2006)



The South Coast NRM Region makes a significant contribution to the WA economy. Albany and Esperance are the largest business and service centres in the region. Many businesses in these towns have been established to service the needs of the timber, agricultural, mining and fishing industries. Primary industries such as tree farming, broad acre cropping, wool, livestock, horticulture and fishing make up the core of the economy while manufacturing activity is based largely on the supply of equipment and machinery to the agricultural sectors and on the processing of agricultural commodities. The tourism and timber industries add to employment and investment. Mining occurs more in the eastern part of the region.

The South Coast NRM Region has many elements that make it innovative and adaptable. These include:

- strong community organisations and existing capacity for innovation in land, water and coastal management
- support for new industries including those based on native plants that can provide both ecological and economic outcomes
- an increasing recognition of the role of Aboriginal people in sustainable land management
- the development or trial of various farming systems and market based instruments to encourage more sustainable use of natural resources
- innovative approaches to restoring functional landscapes by the non-government sector.

Most of all, the region is home to many people who are passionate about this area and who have a wealth of knowledge, skills, experience and ideas to contribute to the development of an ecologically, socially and economically sustainable region.

2.1 South Coast NRM Region boundaries

The boundaries of the South Coast NRM Region do not coincide with jurisdictional boundaries for local government or State Government Agencies. The boundary is based on water catchment boundaries as many management issues are related to catchment hydrology and its effects on water, vegetation and land condition.

In the north-eastern part of the region, catchment boundaries are difficult to define. South Coast NRM and the Rangelands NRM Coordinating Group have realigned their boundaries to match the

boundary of the Shire of Esperance and part of the Shire of Ravensthorpe. This change means that the Local Government Authorities of Esperance and Ravensthorpe only need to be involved in South Coast NRM's planning and implementation processes, rather than two groups.

The modification of the South Coast NRM Region boundary means that there is an increase in the area of the coastal and marine zone which includes all the Islands of the Recherche Archipelago.

South Coast NRM and Rangelands NRM Coordinating Group already cooperate on issues that are cross regional and this arrangement will continue into the future.

2.2 Sub-regions

2.2.1 Kent Frankland - Characteristics

- Located in the most western part of the South Coast NRM Region (Map 1).
- Contains the towns of Rocky Gully, Frankland, Cranbrook, Tambellup, Nornalup, Walpole and Broomehill.
- Contains the high rainfall, forested catchments flowing into the Nornalup and Irwin Inlets, with rainfall dropping off from in excess of 1100 millimetres (mm) per annum at Walpole in the south, to about 400 mm per annum at Tambellup in the north (information based on rainfall 1976 to 2005) according to the Department of Agriculture and Food.
- Vegetation types vary according to the soil type and annual rainfall. Soil types consist of several sand and loam mixes while the vegetation types vary from Wandoo and Yate woodlands near Tambellup, to Jarrah and Marri woodlands and Karri, Tingle and Jarrah forests at Walpole and Nornalup.
- High biodiversity - several endemic species of plants and animals occur in the area including species of tailflower (*Anthocercis sylvicola*), a sprawling spiky Adenanthos (*Adenanthos pungens* subsp. *effuses*), tingle tree species and a gondwanan relictual Moggridgea spider. The sunset frog (*Spicospina flammocaerulea*) also occurs within the Kent Frankland sub-region as well as areas immediately to the west of this area.
- Formation of the Walpole and Nornalup Inlets Marine Park in May 2009 to protect rich aquatic life, significant areas will be protected in the future

- Threats include: Phytophthora dieback, feral animals, environmental weeds, vegetation clearing and human disturbance.
- The southern part of this sub-region is dominated by the national parks, nature reserves and State forests of the Walpole Wilderness Area.
- Industry in the northern part of the Kent Frankland sub-region is predominantly agricultural consisting of cereal crops and grazing with some viticulture and silviculture. Perennial pastures are more predominant in this sub-region and are grown in rotation with wheat, barley, canola, oats and other crops in some areas. Salinity, water repellence, acidic soils and erosion are major threats to industry in the Kent Frankland sub-region. Tourism is a major industry with attractions such as the Tree-top Walk, Valley of the Giants, Walpole Wilderness Area, heritage buildings and wineries attracting thousands of people each year.
- Significance to Aboriginal people includes importance of maintaining cultural customs. Middens, artefacts and fish traps can still be seen near the Walpole-Nornalup National Park.
- Several NRM projects have been funded via *Southern Prospects* in the Kent Frankland sub-region, including to dryland farm forestry, biodiversity education and awareness raising, waterways, perennial pastures, Carnaby's Black Cockatoo habitat protection, soil health and sustainable agriculture.

2.2.2 Albany Hinterland

- Located in the western part of the South Coast NRM Region (Map 1).
- Contains the towns of Denmark, Albany, Mount Barker, Manypeaks and Wellstead and takes in all of the Denmark, Hay and Kalgan River catchments flowing south from the Stirling Range and discharging into the Wilson Inlet and Oyster Harbour.
- According to the Department of Agriculture and Food, WA, the average rainfall for the Albany Hinterland ranges from 950 mm per annum near Denmark in the south-west to 400 mm per annum over the Stirling Ranges in the northern area of the sub-region (information based on rainfall 1976 to 2005).
- The soil type is fairly uniform for the sub-region consisting of yellowish brown sandy and gravelly duplex soils with underlying yellow to grey siltstone, silty sandstone and spongolite Eocene sediments.
- Vegetation types vary across the sub-region and include Jarrah, Marri, Yate, Karri and other woodlands, heathland, shrub lands and grasslands.
- Several species in the area are considered iconic due to their rarity or vulnerability including the Scarlet Banksia (*Banksia coccinea*), Gilberts Potoroo and Noisy Scrub-bird. Several species are endemic to the Albany Hinterland sub-region with ten endemic plant species occurring in the

The Stirling Ranges have a high cultural significance to Aboriginal people.



PHOTO: South Coast NRM.

Porongurup National Park and several relictual endemic species in Denmark. The coastal areas are also important for migrating Southern Right and Humpback whales.

- Contains nine national parks including Gull Rock, the majority of the Stirling Range, Porongurup, Waychincup, Torndirrup, West Cape Howe, William Bay, Mount Lindesay and part of Mount Roe National Parks. Significant nature reserves are also found within the sub-region such as Two Peoples Bay, Mount Manypeaks, South Stirling and Pardelup, which contribute greatly to the rich biodiversity of the area. Threatened species recovery planning and implementation has benefited significant species and communities in these areas. The formation of the Walpole Wilderness area and the Walpole and Nornalup Inlets Marine Park in this sub-region have been significant achievements.
- Areas of the Albany Hinterland sub-region have significance to Aboriginal people of the area, including the Stirling Ranges which has a high cultural significance. The Mineng and Goreng

people originally lived in and around the Stirlings and the ranges featured in many of their stories. The fish traps at Oyster Harbour, the Kalgan River and in Wilson Inlet are also significant. Management of some of these assets has occurred through *Southern Prospects*.

- A diverse range of industries include agriculture, viticulture, silviculture, commercial fishing and tourism which make up the majority of the industries with many other smaller enterprises also operating.
- Threats include: Phytophthora dieback, environmental weeds, salinity, water repellence, nutrient run-off, human disturbance and feral animals.
- Previous NRM projects include environmental weed control, soil health, perennial pastures, Phytophthora dieback management, dryland farm forestry and water quality.

The Stirling Range National Park contains the threatened Montane heath and thicket community.



PHOTO: South Coast NRM.

2.2.3 North Stirlings Pallinup - Characteristics

- Located to the north of the Stirling Ranges in the western end of the South Coast NRM Region (Map 1).
- Contains the towns of Gnowangerup, Borden and Ongerup and takes in the Upper Pallinup Catchment and North Stirling Basin.
- Receives about 400 mm of rainfall per annum.
- Soils consist predominantly of three different soil duplexes: grey deep sandy duplex, alkaline grey shallow sandy duplex and grey shallow sandy duplex. Many soils are susceptible to water logging, subsurface compaction, subsurface soil acidity, wind erosion, water erosion and water repellence.
- The vegetation communities of the area vary widely. The northern sections of the sub-region consist of predominantly Mallee heath and Eucalypt woodland with some swamp sheoak along river systems. The southern section consists predominantly of Mallee heath and Jarrah-Marri or Wandoo woodlands. The Stirling Range National Park contains the threatened Montane Heath and Thicket Community as well as other declared rare and priority flora species.
- The Stirling Range National Park is a recognised biodiversity hotspot containing over 1,500 species of plants of which nearly 90 are endemic, several endangered fauna species and short range endemic invertebrates. Other significant nature reserves include Camel Lake and Corackerup. The rest of the sub-region is mostly cleared with less than 15% of the original pre-European vegetation remaining in the Upper Pallinup area. There are 21 species of declared rare flora and 12 species of priority flora that are found in the remaining vegetation.
- The Stirling Ranges have a high cultural significance to Aboriginal people. The Mineng and Goreng people originally lived in and around the Stirlings and the Ranges featured in many of their stories.
- Industry in the sub-region comprises mixed farming with predominantly cereal cropping production to the north and east, with more livestock (sheep grazing) to the South West. Recreation and tourism are also prominent, with part of the Stirling Range National Park falling into the southern section of the sub-region.



PHOTO: Eileen Rodgers

Callistachys lanceolata.

- Feral animals, soil health issues, Phytophthora dieback and human disturbance are major threatening processes in the North Stirlings Pallinup sub-region. Phytophthora dieback is a particular threat to the biodiversity of the Stirling Range National Park with many parts of the park infested.
- Several NRM projects have been funded via *Southern Prospects* in the sub-region including activities aimed at mitigating soil health issues, establishing dryland farm forestry and perennial pastures, and controlling Phytophthora dieback in the Stirling Range National Park.

2.2.4 Fitzgerald Biosphere - Characteristics

- The Fitzgerald Biosphere sub-region is centred on the Fitzgerald River National Park, a recognised biodiversity hotspot (Map 1). The sub-region also includes the significant Lake Magenta Nature Reserve and parts of the Dunn Rock and Lake King nature reserves.
- Contains the towns of Bremer Bay, Jerramungup, Ravensthorpe and Hopetoun and takes in part of the Pallinup River catchment and all of the Bremer, Gairdner, Fitzgerald, Hamersley, West, Phillips, Steere and Jerdacuttup River catchments.
- The Fitzgerald Biosphere sub-region holds significance to Aboriginal people.
- A diverse range of soil types, including granite, loams and quartzite soils, and varying annual rainfalls across the sub-region has resulted in a wide variety of vegetation types. The average rainfall ranges from 500 mm per annum in the

south and declines to 325 mm per annum in the north east. The coastal areas are dominated by heathland changing to Mallee and in the northern areas Yate woodlands.

- The region contains a diverse range of unique flora and fauna, with many endemic species. Flora species in the Fitzgerald Biosphere include the endemic Royal Hakea (*Hakea victoria*) and Quaalup bell (*Pimelea physodes*) as well as a large number of Banksia, Verticordia and pea flowering species. The Fitzgerald River National Park is one of only two locations in which the highly endangered Western ground parrot can still be found as well as other threatened species including the dibbler, heath rat, woylie, hooded plover and tammar wallaby. The marine area is an important breeding and calving ground for Southern Right Whales during migration.
- A significant threat to the biodiversity of the sub-region is Phytophthora dieback. Relatively dieback free, the Fitzgerald River National Park has provided a safe haven for many susceptible flora species occurring in the sub-region, such as the Banksia and Verticordia species that are under direct threat in other parts of the South Coast NRM Region. Phytophthora dieback is, however, a significant threat to the flora of the Fitzgerald River National Park with several infestations located within the parks boundaries.
- Other threats to biodiversity within the Fitzgerald Biosphere include predation of native wildlife by feral animals (particularly foxes and cats), human disturbance, and inappropriate fire.
- The Fitzgerald Biosphere sub-regions' industry is largely agricultural but the mining industry is increasingly attracted to the Ravensthorpe area. The agriculture of the area consists predominantly of winter cereal production and grazing. Wheat and barley are the main cereal crops grown in rotation with lupins, canola and subterranean or medic pasture. Perennial pastures are grown at lower levels. Salinity, erosion and water repellence have been identified as threats to the industry of the sub-region.
- Several NRM projects have been funded via *Southern Prospects* within the sub-region to mitigate some of the threats relating to land degradation. These include activities relating to soil health, perennial pastures, weed and invasive species control and Phytophthora dieback management.

2.2.5 Esperance Sandplain - Characteristics

- The Esperance Sandplain sub-region is one of the two eastern-most sub-regions of the South Coast NRM Region (Map 1).
- Contains the towns of Munglinup, Esperance and Condingup and takes in the Oldfield-Munglinup, Young, Lort and Dalyup River catchments west of Esperance. To the east are Coramup, Bandy and numerous other smaller creeks.
- Rainfall ranges from more than 600 mm per annum in the south to 400 mm per annum in the north.
- The soils of the Esperance Sandplain consist mostly of deep fine sandy deposits overlying yellow to grey siltstone and spongolite Eocene sediments. The sandy nature of the soils poses the problems of wind erosion and water repellence, while a shallow, clay subsoil in many areas results in water logging.
- Agriculture in the sub-region consists of cropping and grazing. Wheat and barley are cropped in rotation with lupins, canola and subterranean or medic pastures. Livestock industries are also important and include beef cattle, wool production and prime lambs. Tourism is another prominent industry in the sub-region, with the area offering many natural attractions including the Recherché Archipelago (Bay of Isles). The Bay of Isles is made up of nearly 100 islands that hold particular significance for Aboriginal people.
- The sub-region contains an abundance of native flora and fauna with many rare and endemic species. It contains a suite of coastal nature reserves and national parks including Jerdacuttup Lakes and Lake Shaster nature reserves, Stokes, Cape Le Grande and Cape Arid national parks. Cape Arid, in the far east of the sub-region is one of only two remaining locations in which the Western Ground Parrot can be found. The Recherché Archipelago creates a haven for rare flora and fauna including Banksia, the Recherché Cape Barren Goose, Australian Sea-lions, whales, and many others. The sub-region also provides important habitat for Carnaby's Black Cockatoo and has many beautiful wildflower species including the showy Banksia (*Banksia speciosa*) and Ashy Hakea (*Hakea cinerea*).
- Rare flora and fauna can also be found at the internationally significant Lake Gore and Lake Warden, which are both listed as wetlands of



PHOTO: Craig Carter

The South Coast is an important migration route for whales.

international significance under the Ramsar Convention. Lake Gore itself supports the largest known populations of Hooded Plover (*Thinornis rubricollis*), and is important for moulting by thousands of Australian Shelduck (*Tadorna tadornoides*) and for drought refuge by thousands of ducks and shorebirds. Lake Gore also supports thousands of Banded Stilt (*Cladorhynchus leucocephalus*).

- Lake Warden is recognised by the international community as being a major 'hotspot' for biodiversity. The wetland system plays host to thousands of rare water birds including the Hooded Plover, Recherche Cape Barren Goose and the Banded Stilt. This, and other wetland systems are at risk of inundation. Vegetation types in the catchment include sandplain heath, Banksia heath, transitional mallee, paperbark and flat-topped Yate swamps and sedgelands.
- Noongar Aboriginal people maintain cultural links to areas such as Cape Arid, Cape Le Grand and Mt Ridley. The community is actively involved in NRM, with coordination by Aboriginal NRM officers.
- The sub-region has many threats to its biodiversity and industry. Feral animals, loss of habitat, soil health issues and Phytophthora dieback are major threats that need mitigation activities.
- Several NRM projects have been funded via *Southern Prospects* in the sub-region to increase soil health, establish perennial pastures, control

invasive species, manage Phytophthora dieback, protect biodiversity and engage Aboriginal people of the area in NRM issues.

2.2.6 Esperance Mallee - Characteristics

- The Esperance Mallee sub-region is located in the eastern section of the South Coast NRM Region and includes the towns of Scaddan and Salmon Gums (Map 1).
- Rainfall is low with approximately 300-400 mm per annum.
- The sub-region characteristically comprises a level to very gently inclined, internally drained landscape. Clusters of natural salt lake systems are common. Most of the Esperance Mallee sub-region has been cleared for agricultural use with very little of the pre-European vegetation remaining. The vegetation communities comprise mostly Eucalypt Mallee with some Eucalypt woodlands and Melaleuca communities on clay soils. In sandstone areas proteaceous and myrtaceous scrub-heaths grow and in salt affected areas samphire swamps dominate.
- A significant feature of the sub-region is the Great Western Woodland which runs along the far eastern section of the Wheatbelt and into the goldfields, and across the western side of the Nullarbor Plain. The area is considered the world's largest and most intact temperate (or semi-arid) woodland, and comprises a wonderful mosaic of



PHOTO: Wendy Bradshaw.

Woodlands feature in the Esperance Mallee landscape.

- woodlands, heaths, shrublands, sandplains, granite outcrops and natural salt lakes (Department of Environment and Conservation, 2010). The sub-region also includes Peak Charles National Park and Cheadanup Nature Reserve. The area contains many rare flora and fauna species including Salt Myoporum (*Myoporum turbinatum*), the Malleefowl (*Eremophila lactea*), and Carnaby's Black Cockatoo. The sub-region also contains a large network of salt lakes including Lake Tay and the Peak Charles System. The vegetation communities of the gypsum dunes associated with some of the salt lakes are recognised as a threatened ecological community for the sub-region.
- Industry in the Esperance Mallee sub-region is primarily agricultural. Extensive cereal cropping is common with wheat and barley being grown in rotation with canola, lupins, field peas and subterranean or medic pasture. Land north of Salmon Gums is considered to be mostly pastoral.
 - Threats to the sub-region include feral animal predation, habitat loss and soil health issues. NRM projects that have been funded in the Esperance Mallee sub-region include NRM engagement of Aboriginal people of the area and innovation in farm forestry.

2.2.7 Coastal and marine zone

- The marine component of the South Coast NRM Region extends from the coastline out to the three nautical mile limit, including waters to three nautical miles off the coast of offshore islands (see Figure 1). This coastal and marine zone comprises a substantial area of State Government responsibility (approximately one million hectares), and over 1000 km of marine and coastal interface.
- Coastal and marine areas are currently experiencing a high level of recreational usage and impact. The coastal zone is often dynamic and fragile with coastal sand dunes, wetlands and estuaries. These areas are highly valued by the community for their amenity values.
- State marine waters in the region extend in places to approximately 70 km off the mainland around Esperance, due to the extent of the Recherche archipelago. At a broad scale, this marine area includes a range of major benthic habitats along the continental shelf. These areas are directly influenced by the Leeuwin Current, localised hydrological variations and inputs (e.g. river mouths). Global and local climatic conditions and

Southern Ocean swell regimes affect the coastal and marine areas.

- Management and planning for NRM in the coastal zone is guided by Southern Shores (Coffey Environments & South Coast Management Group, 2009). In addition, a draft Regional Marine Strategy Plan (Government of Western Australia, 2010a) and Oceans of Opportunity (Government of Western Australia, 2010b). Major threats to the coastal zone include increased recreational use, including inappropriate use of off road vehicles.
- Funding provided through *Southern Prospects* has included preparation and implementation of management plans, including installation of infrastructure and rehabilitation.

2.3 Major stakeholders involved in NRM

Partnerships and networking are critical to the achievement of good outcomes for land, water, coastal and marine environments and biodiversity. The region has a long history of successful and enterprising groups and individuals engaged in NRM. A feature of many of the groups is the ability to recognise and adapt to changes in political, economic, social or biophysical conditions in order to better address the challenges of implementing sustainable development within the constraints of a landscape that is highly valued yet facing some severe threats.

The coastal zone is dynamic and fragile.

Major subregional groups within the South Coast NRM Region include the Esperance Regional Forum, Ravensthorpe Agricultural Initiative Network, Fitzgerald Biosphere Group, Albany Hinterland Groups (Wilson Inlet Catchment Committee, Oyster Harbour Catchment Group, Albany Eastern Hinterland), North Stirlings Pallinup Natural Resources, and the Gillamii Centre. Within each of the subregions there are numerous other catchment groups, Friends groups, conservation groups and other organisations that link into the regional network. Groups such as the South Coast Management Group, Aboriginal Land and Sea Council, Goldfields Land and Sea Council, the Malleefowl Preservation Group, Gondwana Link Inc., Green Skills, Denmark and Albany Environment Centres, Greening Australia, Bush Heritage and production groups (e.g. Southern Dirt, Evergreen, Stirlings to Coast, South East Premium Wheat Growers Association) and Southern Agricultural Indigenous Landholder Service (SAILS) represent interests that extend across and beyond the region.

All these groups work closely with local government and State Government Agencies to ensure consistency with NRM policy frameworks and to ensure that synergies between all NRM practitioners is achieved. A summary of the major NRM stakeholders in the South Coast region is provided in Table 3.



PHOTO: South Coast NRM.