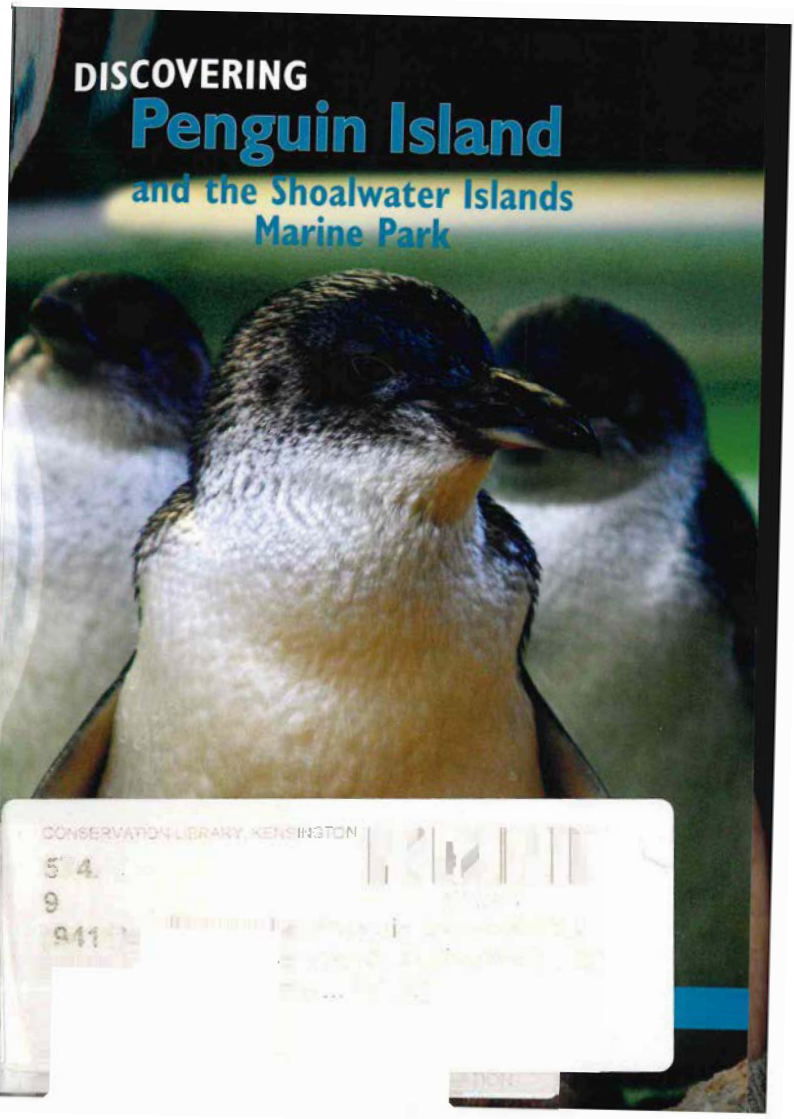
DISCOVERING
Penguin Island
and the Shoalwater Islands Marine Park



ABOUT THE AUTHORS

Kevin Crane is a DEC senior marine operations officer.

Carolyn Thomson-Dans is a special projects officer for DEC who has written and edited numerous publications about WA's natural environment.

Peter Dans is DEC's regional services director. He was a driving force in establishing The Penguin Experience Island Discovery Centre.

Terry Goodlich is a DEC senior ranger.

PUBLISHER Department of Environment and Conservation, 17 Dick Perry Avenue, Kensington, Western Australia, 6151.

TEXT FOR PENGUIN ISLAND NATURE WALK: John and Elizabeth Rippey and Terry Goodlich.

TECHNICAL ADVISORS: Nic Dunlop, Clay Bryce, Ron Johnstone, Di Jones, Ken Aplin, Nora Cooper, Lindsay Joll, Boze Hancocks, Chris Chubb, Andrew Hancock and Ron Wooller.

EDITORS Samille Mitchell and Joanna Moore.

DESIGN AND PRODUCTION David Abel.

COVER Little penguin. Photo – Michael Pelusey

BACK COVER Penguin Island. Photo – Michael James/DEC

MAPS Promaco Geodraft.

ISBN 978-1-921703-01-0

DISCOVERING
Penguin Island
and the Shoalwater Islands Marine Park

by
Kevin Crane, Carolyn Thomson-Dans,
Peter Dans and Terry Goodlich

Department of
Environment and Conservation

CONTENTS **PAGE**

Photo – Samille Mitchell/DEC

Above: Boardwalk, Penguin Island.
Opposite: Snorkelling in Shoalwater Islands Marine Park, near Penguin Island.

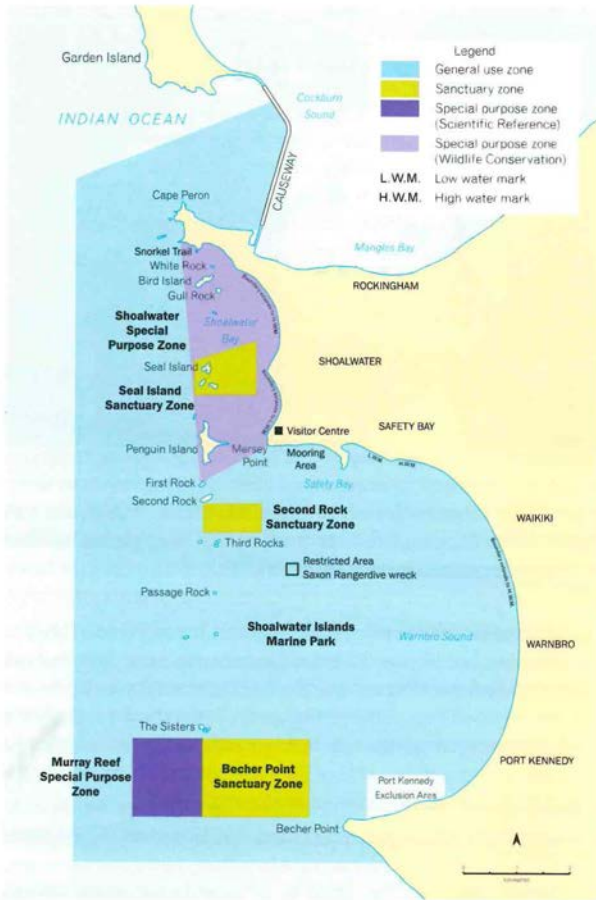
Photo – Michael James/DEC

INTRODUCTION

Penguin Island is a truly unique place. Only 42 kilometres from the centre of Perth, it is home to a diverse array of wildlife and boasts beautiful marine and coastal scenery. It is home to the largest colony of little penguins in Western Australia. The 12.5-hectare island is less than 700 metres offshore from the growing regional centre of Rockingham.

The island is located within the waters of the Shoalwater Islands Marine Park, which surrounds a chain of limestone islands and protects picturesque submerged reefs inhabited by diverse plant and animal life. The reef areas support a variety of temperate and subtropical invertebrates, including sea stars, urchins and shellfish, as well as numerous fish species. Bottlenose dolphins are extremely common in the park's waters and the islands provide havens for sea lions and seabirds.

The Department of Environment and Conservation and its predecessors have been managing Penguin Island since 1987. The department has progressively undertaken works to rehabilitate and enhance the natural environment and provide essential facilities to make it one of the State's premier ecologically sustainable nature-based tourism destinations. The island has something special for visitors of all ages, whether from the local or metropolitan area, interstate or overseas.


Garden Island
INDIAN OCEAN
Cockburn Sound
CAUSEWAY
Cape Peron
Snorkel Trail
White Rock
Bird Island
Gull Rock
Shoalwater Special Purpose Zone
Shoalwater Bay
Seal Island
Seal Island Sanctuary Zone
Penguin Island
Mersey Point
Visitor Centre
Mooring Area
SAFETY BAY
Safety Bay
First Rock
Second Rock
Second Rock Sanctuary Zone
Third Rocks
Restricted Area
Saxon Rangerdive wreck
Passage Rock
Shoalwater Islands Marine Park
Warnbro Sound
The Sisters
Murray Reef Special Purpose Zone
Becher Point Sanctuary Zone
Port Kennedy Exclusion Area
Becher Point
Mangles Bay
ROCKINGHAM
SHOALWATER
WAIKIKI
WARNBRO
PORT KENNEDY
Legend
General use zone
Sanctuary zone
Special purpose zone (Scientific Reference)
Special purpose zone (Wildlife Conservation)
L.W.M. Low water mark
H.W.M. High water mark

HISTORY

Penguin Island was probably first used by Aboriginal people, although no evidence of their presence has been found. Whalers and sealers landed there during the 1800s.

Seaforth McKenzie is the first person known to have lived on Penguin Island. The eccentric Canadian-born mining engineer was described as a "bearded man with gallant manners and a twinkling eye". He squatted on the island from about 1914 but did not at first reside there permanently. In 1918, when Penguin Island was gazetted as a reserve for public use, McKenzie was given an annual lease. He planned to develop a holiday resort on the island.

McKenzie hollowed out several of the island's limestone caves. Some were crudely furnished and he encouraged campers to use them. Visitors could take supplies from a store in a small cave, as long as they left a fair amount of money or something of equal value. One of the caves was called 'The Palace'. Here, a ball was staged after McKenzie was crowned 'King of the Island' at a grandiose ceremony. A lover of literature, McKenzie would often invite his friends to lamp-lit poetry readings in the 'Library' cave. He built a timber and iron 'Manor House' for himself. Visitors appear to have greatly admired and respected him, despite his eccentricities.

After leaving the island in 1926, McKenzie lived on the mainland for a short time, before returning to his previous home in New Zealand. He explained his 45-year absence (he left wife Sarah and their six children to go to work one day and never returned) by saying he had only just regained his memory of his family. Today, the only reminders of his presence are some nails in the cave walls, a few gnarled fig trees and an old well. But one of his traditions lingers on; people still escape to the island for relaxation and good times.

Following McKenzie's tenure, the island was leased to several other private enterprises. One ambitious leaseholder during the 1950s and 60s carried visitors to the island in an amphibious vehicle, an ex-

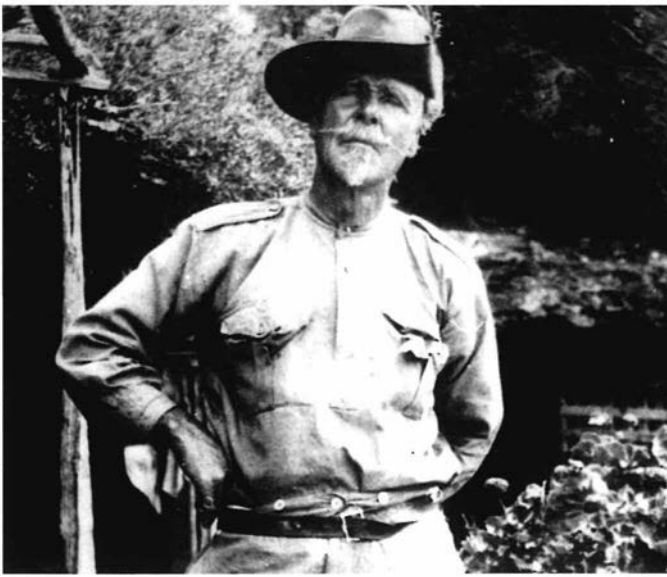


Photo – Courtesy of Terry Goodlich/DEC

Seaforth McKenzie.

Army DUKW. One of these was later dumped near the jetty to slow erosion and parts of it can still sometimes be seen protruding from the sand. Shacks were built to house holidaymakers and carnival-style entertainment was provided.

In 1987 the National Parks Authority (now the Department of Environment and Conservation) bought the lease, and now manages the island as a conservation park. The shacks have been removed and replaced with more appropriate facilities, such as a new penguin viewing facility, a research and management building and improved recreation facilities.

Visits to the island are restricted during the penguin breeding season, usually from June to about mid September. But for the rest of the year, visitors can enjoy the island's beaches and surrounds during daylight hours.

PENGUIN ISLAND NATURE WALK

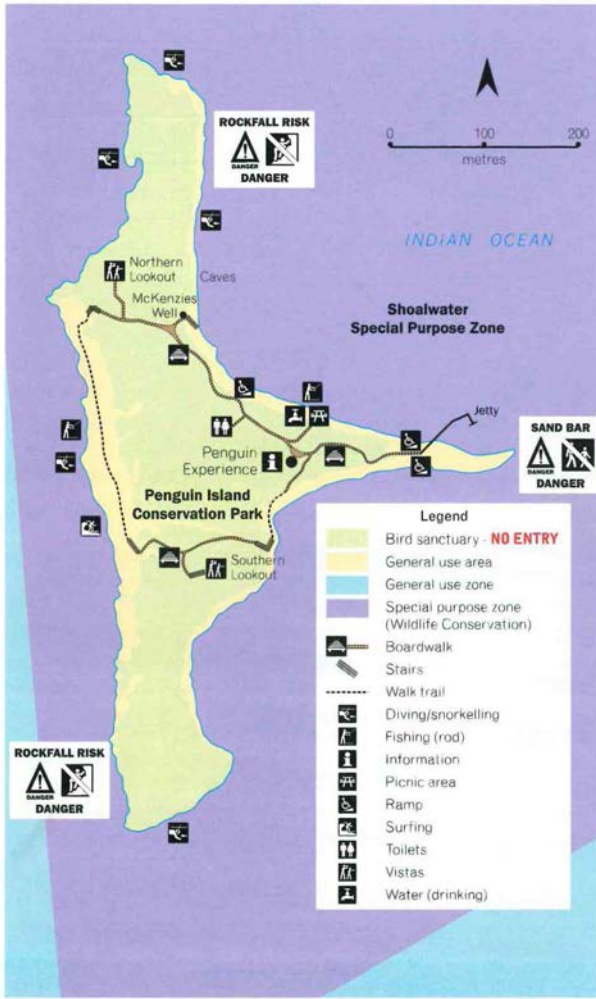
Up to 80,000 people visit Penguin Island each year, and this number is steadily increasing. Much of the Penguin Island Conservation Park is very fragile. Degradation caused by uncontrolled access in the past has been largely rectified. The boardwalks and walkways that criss-cross the island have helped the vegetation grow back. Penguins also like to nest beneath the boardwalks. Putting down brush on eroded areas has also enabled revegetation.

1. Begin the walk at The Penguin Experience Island Discovery Centre. This facility enables visitors to learn about penguins and see them without disturbing the wild population on the island. Penguins lay two eggs but usually only raise one young – the other is rejected and it dies. The birds that live in this facility have either been rejected by their mothers as chicks and raised by wildlife carers or nursed back to health after injury. They would otherwise have died. However, they have now become so used to people that they would probably be unable to survive in the wild.

2. The picnic area is adjacent to The Penguin Experience building. Norfolk Island pines (*Araucaria heterophylla*), Rottnest Island tea trees (*Melaleuca lanceolata*) and watered lawns were not part of the original flora.

3. Take a quick detour down to the beach. Seagrasses form meadows around our coasts and grow extensively in the Shoalwater Islands Marine Park. They are true flowering plants with flowers, fruits and seeds and they grow on bare sand. They provide shelter for many varieties of small sea creatures including the cobbler, a fish with venomous spines on its fins.

4. Return to the boardwalk. In nearby vegetation you may well see a penguin in its burrow or beneath the boardwalk. The bird-sized paths you can see through the bushes are made by the penguins and you can also make out their tunnels in many places. However, avoid disturbing the birds and the vegetation and keep to the boardwalk.


ROCKFALL RISK
DANGER
0
100
200
metres
INDIAN OCEAN
Northern Lookout
Caves
McKenzies Well
Shoalwater Special Purpose Zone
Jetty
SAND BAR
DANGER
Penguin Experience
Penguin Island Conservation Park
Southern Lookout
ROCKFALL RISK
DANGER
Legend
Bird sanctuary - NO ENTRY
General use area
General use zone
Special purpose zone (Wildlife Conservation)
Boardwalk
Stairs
Walk trail
Diving/snorkelling
Fishing (rod)
Information
Picnic area
Ramp
Surfing
Toilets
Vistas
Water (drinking)

Penguin Island is the largest and the most northerly breeding colony of little penguins in Western Australia. Little shearwaters (or muttonbirds) also nest in burrows on the island.

5. Caves fringe the beach. Seaforth McKenzie, a colourful local character, lived on the island with an Aboriginal companion from about 1918 until 1929. He enlarged and used the island's caves for many purposes. One was a library, for instance; another was a store room. McKenzie encouraged visitors. He kept supplies in one of the small caves where visitors were able to take what they needed on the understanding that they would replace the items with something of equal value or a fair amount of money. There was also a well that was formed from the seepage of rainwater through the limestone crevices which supplied brackish water for washing. Stone steps led into a cave which protected the visitors' drinking water and where visitors could place their milk cans and butter to keep them cool. McKenzie moved to Mersey Point in 1926.

6. Bridled terns are one of five species of tern found on Penguin Island, the others being the crested tern, Caspian tern, roseate tern and fairy tern. They nest in the hollows of rocks. Their eggs are slightly triangular in shape to prevent them from rolling out of the nest scrape. Up to 1,000 pairs of these terns have been recorded on Penguin Island. However, competition from silver gulls may be responsible for a decline in the population. Gulls have increased from 200 pairs to more than 3,000 pairs in the past 50 years, due to the availability of additional food sources such as Rockingham disposal site and hand feeding by people. See page 30 for more information on bridled terns.

7. Go back along the beach to the steps and walkway to the northern boardwalk. Take a close look at the plant species growing here and Seaforth McKenzie's well. Keep an eye out for sea spinach (*Tetragonia decumbens*) and sea berry saltbush (*Rhagodia baccata*). Sea spinach and saltbush are very good nesting habitats for penguins.

8. Move up to the summit lookout on the northern boardwalk. From the lookout, you can clearly see Shag Rock, and then behind it Seal

Above: Inside The Penguin Experience.
Below: Educational opportunities at The Penguin Experience.

Photos – Michael James/DEC

Island, which has a sandy beach used by Australian sea lions resting between their long fishing trips. Sea lions found near Perth are all males. Most of them vacate the area once every 18 months to travel north to the breeding islands about 200 kilometres north of Perth. To avoid disturbing these mammals, visitors are not permitted to land on Seal Island. However, this policy is as much to protect people as it is to protect the sea lions, which can deliver a painful bite if angered.

9. You may see some of the reptiles that live on Penguin Island. There are no snakes on the island but several reptile species live here, including legless lizards and skinks. King's skinks are the largest and are often seen searching for bird eggs in the undergrowth or in the caves. They also eat mice and young birds.

10. As you move down to the beach, look at the pig face (*Carpobrotus virescens*) that grows near the walkway. This species has fleshy leaves up to 65 millimetres long and pinkish-mauve flowers. The leaves are used to store moisture in the harsh dune environment. King's skinks eat the flowers of pigface and introduced dandelions.

At the beach you can see the limestone rocks that form the core of Penguin Island. The limestone may have a hard crust or form hollow circular formations within the rocks called solution pipes. These features withstand erosion, while softer areas are weathered away to form caves or archways. If these formations collapse, rock slopes are formed. One theory about the formation of the solution pipes is that they may be the remains of large tuart trees that once grew when the island was part of the mainland. It is believed they became fossilised by the repeated dissolving and redepositing of limestone leaching from the sand that covered them.

Look at the rocks close to the sea for a covering of cyanobacteria (a blackish film on the surface) and for small sea shells. You may also notice rock pools in which sea anemones, chitons and sea shells may be found.

11. Shells found here may include those of abalone and chitons. There are strict regulations that control the capture of live abalone and these shellfish can only be taken under licence during a limited

Above: Pig face.

Below: Solution pipes in limestone rocks.

Photos – Michael James/DEC

season. A large turban shell (*Turbo torquatus*) may have scars on the surface where small limpets have adhered to it. These limpets feed on the host shell's mucus and body wastes. In one species the largest of these limpets (*Hipponix*) is female and the smaller ones are males. Should the female die or move away there is competition among the smaller males. The strongest will then grow in size and in due course change to a female.

You may also find fan shells (parts of bi-valves). Some of these may have neat round holes in them. This is as a result of the soft meaty occupant of the shell having been eaten by another mollusc, which drills a hole with a tongue-like structure that is coated with teeth. Acid digestive juices aid the process.

12. Turn left up the southern walkway. There is a different vegetation community in this part of the island. Look out for native rosemary (*Olearia*), a silver plant with aromatic leaves. Squeeze a leaf and then smell your fingers. This plant was used by early settlers as a herb. Sea rocket (*Cakile maritima*), a small plant with four mauve petals, grows low down on the beach. The area is also infested with the South African onion weed (*Trachyandra divaricata*).

13. Take the walkway to the lookout. This is the highest point on the island. From this vantage point, you can clearly see that Penguin Island is part of a chain of islands that originally formed as a row of coastal sand dunes when sea levels were lower. The sea level was 130 metres lower 18,000 years ago, 10 metres lower 7,000 years ago and rose to two metres above the present level 5,000 years ago. As a result, WA's coastline is constantly changing. At one time, Penguin Island was part of the mainland and more recently it was virtually submerged. The lookout overlooks Warnbro Sound. Becher Point south of Rockingham is the southernmost point of the Shoalwater Islands Marine Park.

The platform reefs which can be seen on the western side of the island have been cut by constant wave action against the limestone and possibly by grazing marine animals.

Photo – Terry Goodlich/DEC

Above: Boardwalk to the jetty.

Below: View from the northern lookout.

Photo – Samille Mitchell/DEC

14. Walk back along the southern walkway, turn right and go down towards the beach. The vegetation here is dominated by summer-scented wattle (*Acacia rostellifera*), a shrub about three metres tall. Old man's beard (*Clematis microphylla*), an attractive creeper with fluffy white seeds, can be seen climbing through the wattle.

15. Descend to the beach, where penguins emerge shortly after the sunset. There is an old wreck, the *Belle of Bunbury*, just offshore. This 42-tonne coastal schooner was wrecked in December 1886. It sank in about six metres of water after striking rocks near the island. Six tonnes of potatoes and 70 bales of wool, but no lives, were lost.

The sandbar, or tombolo, that connects Penguin Island with the mainland was fully vegetated in 1837 when the area was first surveyed. Similar bars link Seal Island and Bird Island with the mainland. Point Peron was once an island but now adjoins the mainland.

As you approach the sandspit, you will notice the seabirds roosting, mainly gulls and crested terns. Fifty-two species of birds have been described within the Shoalwater Islands. Pied oyster-catchers, silver gulls, roseate terns, Caspian terns, crested terns, fairy terns, bridled terns, pied cormorants, buff-banded rails and singing honeyeaters nest on the islands. So, unfortunately, do feral pigeons. You may see wading birds, such as ruddy turnstones, which migrate from as far away as Siberia. Arctic and pomerine skuas (jaegers) can sometimes be seen over the sea, chasing gulls. These birds are larger than gulls and are magnificent fliers. They feed by chasing gulls, which having been disturbed and, wishing to lighten themselves to get away, regurgitate the food they have just eaten. This is caught by the skuas and consumed with relish.

16. A few steps along the beach will return you to the jetty. Near the jetty you can see spinifex (*Spinifex longifolius*) growing up to a metre high.

Photo – Erin Biggs/DEC

Above: A little penguin under the boardwalk.
Below: View from the southern lookout.

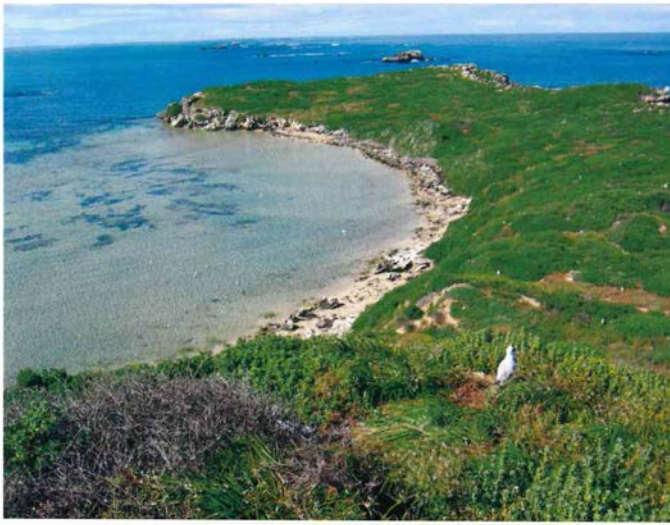


Photo – Terry Goodlich/DEC

LITTLE PENGUIN

(Eudyptula minor)

Most little penguins land on Penguin Island an hour or two after sunset. They assemble just offshore in small groups or 'rafts' before landing, drawn together by their barking calls. The scientific name of the little penguin means 'little diver' and they are indeed adept in the water. They are heavy for their size because of the strong skeleton needed to withstand the pressure of the depths to which they dive.

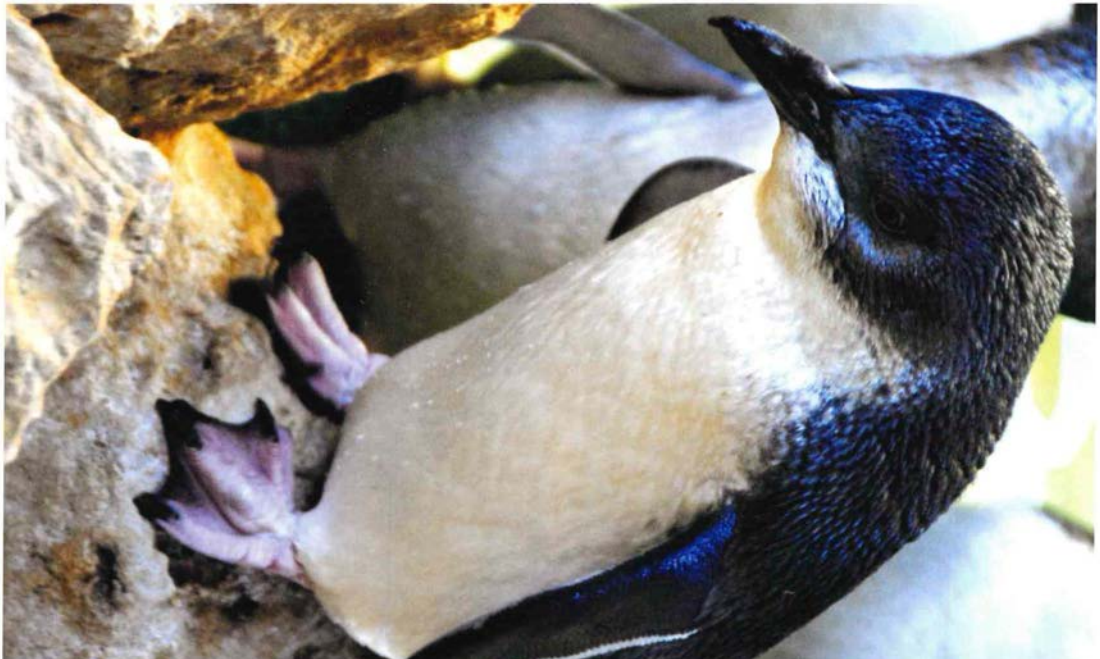
DESCRIPTION Penguins are superbly adapted to the marine environment. The wings of these flightless seabirds have evolved into flippers for underwater propulsion, while their pin-like feathers form a waterproof, insulating coat which streamlines the birds in the water. The Penguin Island birds dive to depths between one and 20 metres, with a dive duration of about 10 to 30 seconds. Their dives here seem to be limited by the depths of water they dive in, as little penguins elsewhere can dive up to 70 metres. These hard-working little birds can dive 150 times an hour in their search for food. They lie belly down on the surface of the water when at rest. The little penguin is the smallest of the 17 penguin species. Adults stand about 40 centimetres tall and weigh about a kilogram, but birds in the Shoalwater area are larger than those found elsewhere in Australia.

STATUS AND DISTRIBUTION WA penguins have declined in number since European settlement. Predation by foxes and cats has had an impact on birds nesting on the mainland and colonies are now largely confined to offshore islands. At sea, penguins are vulnerable to hazards such as discarded plastics and fishing line, oil pollution, sea lions and sharks. Penguin Island supports about 1,200 little penguins and is probably the largest breeding colony in WA.

PREFERRED HABITAT Little penguins spend their days at sea and return to land at night. They nest in sand dunes and among scrub, in crevices and burrows.

LIFE HISTORY Penguin courtship is a noisy affair. The birds constantly squabble over nest sites and squawk raucously to their mates.

Photo – Samille Mitchell/DEC



Breeding females lay one or more clutches of two eggs between June and September. Incubation is shared by both parents over five weeks. Two chicks often hatch, but usually only one is raised unless food is abundant. Little penguins often breed with the same partner in successive years. Some change mates because their partner dies but about a fifth 'divorce' their mates, especially if they do not manage to raise any young. Little penguins in the Shoalwater area breed earlier and for longer than elsewhere. Mortality of chicks is high, with about half surviving to eight weeks, when they are ready to leave land for the first time. At Penguin Island, they take to the seas, only to return to their Penguin Island homes after at least one year. No one knows where they travel during this time. They do not breed until three or four years of age, and can then expect to live for another six or seven years. However, some little penguins survive for 20 years. About 15 per cent of adults die each year.

FEEDING The little penguin colony on Penguin Island consumes more than 100 tonnes of fish every year. When food is abundant, more chicks survive to fledging. Little penguins can swim eight kilometres per hour and dive as deep as 60 metres to catch pilchards, whitebait and other small fish. The birds may venture 200 kilometres from Penguin Island on extended feeding excursions, but during breeding they generally feed within a 15-kilometre radius.

MOULTING Penguin feathers must remain watertight at sea and cannot be replaced progressively like other birds. After breeding, little penguins spend some time at sea fattening up before returning to the island to moult.

During a two to three-week period in December or January, plumage is shed *en masse* and then replaced. Penguins do not go to sea to feed during this stressful process. Moulting penguins often stand in the open to cool themselves and are particularly vulnerable to disturbance at this time.

CALL Penguins have up to nine different calls, ranging from puppy-like barks to loud braying sounds.

Photo – Michael James/DEC

Photo – Babs and Bert Wells/DEC

AUSTRALIAN PELICAN

(*Pelecanus conspicillatus*)

Pelicans can often be seen on a hot day hitching a ride on spiralling thermal updrafts. The birds spread out from their colonies with slow, heavy wing beats, searching out suitable updrafts. When one is found, the lead birds begin to circle, flapping their wings intermittently, rising steadily through the sky. Within minutes a 'staircase' is formed, with 10, 20, or perhaps 100 pelicans spiralling steadily upwards. When they reach a suitable height they peel off and glide towards their destination. On short journeys one updraft may be enough; over longer distances several are needed. In this way the birds avoid expending the considerable energy needed to propel their bulk through the air by flapping.

DESCRIPTION Pelicans are recognised by their bold black and white markings, blue legs, enormous bill with pink pouch and yellow eye-rings. During courtship the pouch becomes bright red, blue and orange.

STATUS AND DISTRIBUTION They are common throughout most of Australia and small numbers occur in Indonesia, New Guinea and the Western Pacific islands.

PREFERRED HABITAT These birds inhabit fresh and saltwater lakes and estuaries, rivers, swamps and sea shores.

LIFE HISTORY The bird's pouch is used mainly as a 'scoop net' for catching small fish and shrimps, rarely for carrying them. The pouch is also used for catching rain. Birds sitting on nests during heavy rain showers have been seen with bill open and pouch distended, facing head to wind. The total pouch capacity is seven litres! Pelicans are colonial nesters. Colony sizes in WA's nine regular breeding sites vary from a dozen pairs to more than 1,000. They almost invariably nest on islands. Nests are little more than shallow scrapes on the ground, often lined with pieces of seaweed and discarded feathers. Two eggs are laid. Chicks gather in small mobs or 'crèches' soon after hatching.

CALL Normally silent.

Photo – Ian Herford/DEC

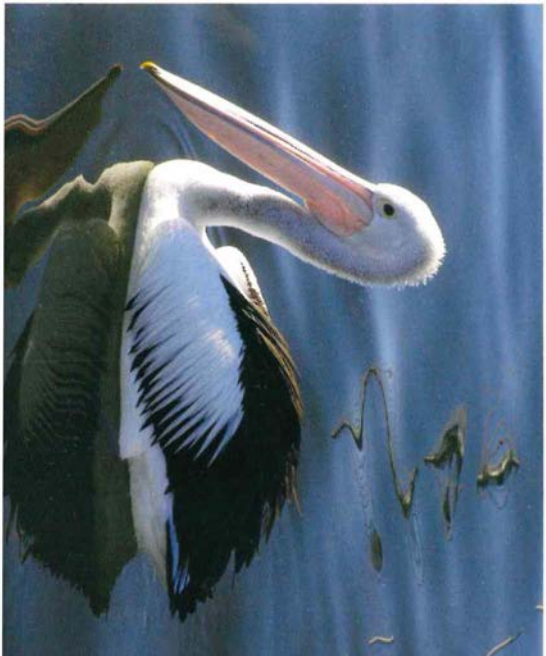


Photo – Duncan Dodd

SILVER GULL

(*Larus novaehollandiae*)

The silver gull is a majestic bird and its cohabitation with people has brought pleasure to many. However, the great adaptability of silver gulls to human environments – especially open rubbish tips – and the bad habits of people hand-feeding them with food scraps, have seen this bird become an urban nuisance, and made the naturally aggressive gull even bolder. The birds breed on about 100 islands around the coastline, mostly in small colonies. Around centres of human habitation such as Penguin Island, however, the colonies have exploded, displacing other seabirds.

DESCRIPTION Adult silver gulls are white, with a silvery-grey back and wings. The outer tail features are tipped with black. The white eye is circled with a maroon ring and the legs and beak are scarlet. Penguin Island is now a very large breeding colony for the silver gull. As a result, a high proportion of young and sub adult birds can be seen on the island. See if you can pick out these youngsters by the colour of their plumage. Young birds are a mottled sandy brown with black spots. Immature gulls have orange, rather than red, bills and brown legs. The shoulders and back usually have brown mottling.

STATUS AND DISTRIBUTION Silver gulls are common and now found in greater numbers than before European settlement. There are an estimated 80,000 in WA. They range throughout the Australian coast, and some inland areas of eastern Australia.

PREFERRED HABITAT Most people think of silver gulls as seabirds, but they are in fact shore birds. They breed on offshore islands but on the mainland they are found anywhere where there is ample food, such as rubbish dumps, together with fresh water and they can venture several hundred kilometres inland. They are also at home in city parks and coastal beaches.

LIFE HISTORY Around Australia, most gull species nest once a year, but because of Perth's climate, local silver gulls lay more than one

Photo – Michael James/DEC

clutch of between one and three eggs between April and November. Two broods are usually raised each year. The eggs are olive with brown and black blotches and are easy to see. The parents share the task of raising the young. Incubating the eggs takes from three to four weeks and the young leave their nests about four weeks after hatching. After this, life becomes a struggle. Younger birds are at the lowest end of the pecking order and will be driven away from feeding areas by adult birds. You can observe this behaviour if you take the time to watch a feeding flock.

These birds eat almost anything but their diet varies with the location. They feed naturally on dead fish, plankton and crustaceans washed up on beached seaweed. However, research has shown that a high proportion of gulls' food now consists of fried chicken, sausages and bread. Silver gulls will also sometimes steal the eggs and eat the young of other birds. Because people have changed the gulls' natural behaviour by feeding them, local recreation grounds and picnic spots are often turned into gull begging sites with squabbling, noisy free-for-alls. Please resist the temptation to add to these problems by feeding the birds. In some parts of the island it is now hard to be heard over the noise of the gulls.

CALL Seagulls make the drawn-out, melancholy 'kwarr' with which most people are familiar.

CRESTED TERN

(*Sterna bergii*)

Crested terns are common on Penguin Island, roosting in large numbers on the sand spit near the jetty. They often plunge into the water in pursuit of small fish, leading to the name 'diver'. Congregations of terns at sea usually indicate the presence of baitfish.

DESCRIPTION The crested tern has long, tapered grey wings, a grey back and white underparts. Its yellow bill is fine and sharp and it has relatively short black legs. This tern's most distinguishing characteristic is its shaggy black cap or crest. During courtship and breeding this cap is jet black and erect, but it moults and becomes mottled at non-breeding times. The crested tern is a similar size to the silver gull, but has a bigger wingspan which is evident in flight.

STATUS AND DISTRIBUTION The crested tern is common around Australia's entire coastline and widespread around the world. It is found in Fiji, southern Asia, southern Africa and the Red Sea.

PREFERRED HABITAT These attractive birds are common around the Australian coast. They rarely move inland. An estimated 1,500 pairs nest on small offshore islands around the coastline of metropolitan Perth. Some nest on tiny islands in coastal salt lakes. The crested tern does not breed on Penguin Island, preferring nearby Seal Island.

LIFE HISTORY Crested terns generally breed from two years and at 12-month intervals. Roosting sites, known as clubs, are the focus of courtship displays which involve intricate dances and postures. To show his devotion, a male bird often presents a potential mate with a small fish. If it is not eaten, the fish will be carried in a spiralling upward flight of up to 250 metres, before the pair spiral and glide downward together. Crested terns nest on clear, flat ground within sight of water. Nests are usually close together and often near gull nests. One sandy, stone-coloured egg is usually laid (rarely two). Chicks are active a few days after hatching and usually fledge in five weeks.

CALL These birds produce a noisy rasping 'carrik' or 'kirrik'.

Photo – Duncan Dodd

Photo – Babs and Bert Wells/DEC

CASPIAN TERN

(Sterna caspia)

The Caspian tern is the largest of all terns. It flies with slow, easy wing beats and, like the crested tern, has a habit of plunging into the water from considerable heights in pursuit of food. The primary diet is fish, some quite large, taken from salt or fresh water. This bird will become aggressive if intruders enter the nesting area, swooping close and emitting a sharp 'kah'.

DESCRIPTION The large size and big bright, reddish-orange bill distinguish this tern from other species. The Caspian tern is about 550 millimetres long, with a wingspan between 1,100 and 1,300 millimetres. Like the crested tern, it has a black crown that becomes streaked and mottled with white when not breeding. The underside of the body is white, the upper body a pale grey and the legs black.

STATUS AND DISTRIBUTION Found around the Australian coast, the Caspian tern is widespread but not numerous in any area. It is somewhat nomadic and usually seen individually or in pairs. The tern is also found in North America, New Zealand, Africa and Eurasia. In Shoalwater Islands Marine Park it has been recorded breeding on Shag Rock as well as Bird, Seal and occasionally Penguin islands.

PREFERRED HABITAT Caspian terns generally stay close to large bodies of water. They are most common on coasts but may venture inland to large rivers, lakes and reservoirs.

LIFE HISTORY Caspian terns engage in aerial courtship involving coupled high-speed twisting-turning dives. The pair may then preen each other before mating. One or two eggs are laid in a shallow scrape which may have a sparse lining of seaweed, sticks or grass. The large eggs, a stone colour with a few small brownish splotches, are incubated by both parents for about 22 days. The downy chicks have distinctive bright orange bills and move about within a few days.

CALL The Caspian tern is generally silent, but makes a sharp 'kah' as a warning or alarm call.

Photo – Babs and Bert Wells/DEC

BRIDLED TERN

(*Sterna anaethetus*)

The bridled tern is seen in the Shoalwater area during spring and summer. At first, these graceful fliers are only heard on the islands at night, feeding far offshore during the day. However, as summer and courtship approach, they are regularly seen on Penguin Island, especially in the morning.

DESCRIPTION The bridled tern is smaller than the crested and Caspian terns, measuring about 400 millimetres long. It sports a long, fine white eyebrow that resembles a bridle. The crown, nape, bills and legs are black. The back, tail and upper wings are a sooty dark drown and the underside is a dull white.

OTHER NAMES Brown-winged tern, dog tern.

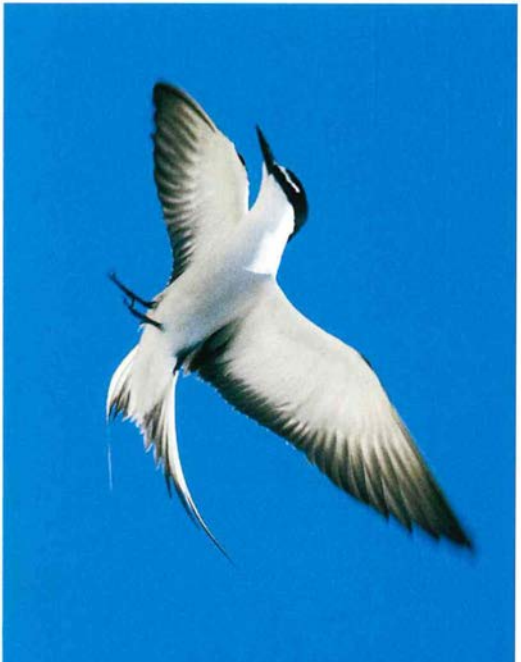
STATUS AND DISTRIBUTION In Australia, the bridled tern nests from Cape Leeuwin, right around the northern coastline to Queensland. There have been some breeding records from South Australia, and the range of this species has been extending southward along the Western Australian coast for many years. In the Shoalwater Islands Marine Park, birds nest on Shag Rock, Bird, Seal and Penguin islands and in rocky island and stack areas at Cape Peron.

PREFERRED HABITAT Bridled terns rarely visit mainland shores, preferring offshore islands. They are migratory, usually arriving in the Shoalwater area in October. They often leave en masse in April, a spectacular sight. Banding has shown that terns from the southern coast of WA spend our winters in the Indopacific north of the Equator. Bridled terns generally nest on rocky limestone areas of Penguin Island.

LIFE HISTORY Bridled terns eat small fish, crustaceans and insects, often feeding many kilometres out to sea. Courtship displays feature intricate parades and flights. The male often regurgitates food for the female just before copulation. They lay one egg in a shallow indentation and it hatches after about 30 days. Chicks are mobile within a week of hatching and fledge at about nine weeks of age.

CALL The call is a bark-like 'wup-wup'.

Photos – Babs and Bert Wells/DEC



PIED CORMORANT

(*Phalacrocorax varius*)

Pied cormorants are often seen perched on rocky vantage points, preening themselves or hanging out their wings to dry. These diving birds catch their prey underwater, plunging in head first to grasp fish, crustaceans and molluscs in their strong, hooked bills. Groups can be seen flying in V-shaped formations.

OTHER NAMES Shag, yellow-faced cormorant.

DESCRIPTION These large birds reach up to 840 millimetres long. They are readily identified by the large bright yellow patch in front of each eye. As their name implies, they are black above and white below. Like other cormorants and darters, they have a large, elongated body and long neck. The tail is relatively short. The feet are webbed, to help with underwater propulsion.

STATUS AND DISTRIBUTION Pied cormorants are common all around the coastline of mainland Australia and they are also found well inland in most other Australian states.

PREFERRED HABITAT In WA these birds are common on islands, coastal areas and estuaries. They nest on offshore islands. In the Shoalwater Islands Marine Park they alternate their breeding between Seal Island, Bird Island and Shag Rock.

LIFE HISTORY To nest, pied cormorants congregate in large colonies. On the Shoalwater Islands, laying occurs from late February to early July. The male selects a nest site and sets about attracting a female by seductively waving his wings, throwing back his head, and fanning his cocked tail. Three to five limy white eggs are laid in a nest of sticks. Both parents care for the eggs and offspring.

CALL Male pied cormorants produce a variety of loud calls at the nest. The females make a hissing sound.

Photos – Babs and Bert Wells/DEC

OYSTERCATCHERS

(*Haematopus* species)

Oystercatchers are readily recognised by their pink legs, brilliant red eyes and long red, scissor-like bills, used to prise molluscs from their shells. Pied oystercatchers (*Haematopus longirostris*) and sooty oystercatchers (*H. fuliginosus*) are either 'stabbers' or 'hammerers', depending on which method of feeding they learn from their parents. After first digging out their prey from wet sand flats, stabbers extract the prey with a quick jab, while hammerers beat the shell until it breaks.

DESCRIPTION The sooty oystercatcher is black all over, while the pied oystercatcher has a black head, neck, upper breast, wings and tail. Both birds are about 50 centimetres long.

OTHER NAMES The sooty oystercatcher is sometimes called black redbill.

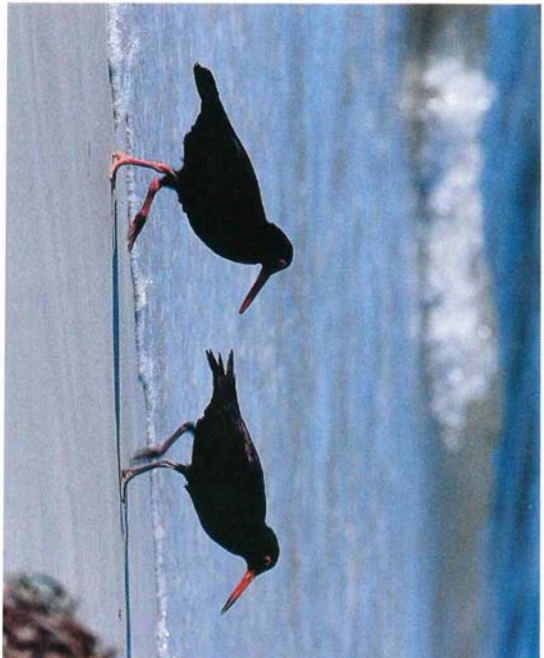
STATUS AND DISTRIBUTION Both species are common around all parts of the Australian coast. The pied oystercatcher also occurs in New Guinea.

PREFERRED HABITAT Oystercatchers live along rocky shores, beaches, estuaries and offshore islands.

LIFE HISTORY These birds lay two to four eggs in a shallow sandy depression. Both sexes will incubate the eggs and care for the young. Sooty oystercatchers share these duties fairly equally, but female pied oystercatchers do most of the incubation. The young leave the nest within a couple of days of hatching but remain with their parents for several more weeks. The adults will go to great lengths to defend both the eggs and young, even to the extent of feigning their own death. Pied oystercatchers occasionally nest on Seal Island.

CALL They make a loud 'kleep' or 'hu-eep' sound.

Photos – Babs and Bert Wells/DEC



GIANT PETRELS

(*Macronectes* species)

Winter storms bring a variety of wildlife to our shores. A common visitor to the metropolitan coast during winter is the juvenile southern giant petrel (*Macronectes giganteus*). The northern giant petrel (*M. halli*) arrives here less frequently. Both are aggressive, piratical scavengers.

DESCRIPTION The southern and northern giant petrels are by far the largest members of the petrel family. Males can reach almost a metre long, with a wing span of between 185 and 205 centimetres. Their large, tube-nosed bill is 90 to 105 millimetres long and has a sharp hook. The juvenile birds are mainly blackish, gradually fading to dark greyish-brown, with mottled white on their forehead and face. These are the birds most often seen in the Shoalwater area. It is hard to tell southern and northern giant petrels apart, but the southern giant has a pale green tip on the bill and the northern giant features a dark red tip.

OTHER NAMES Both birds are also known as giant fulmars or stinkers.

STATUS AND DISTRIBUTION These petrels have been recorded around the coastline of southern Australia including Tasmania. They are not seen in Australian waters above the 26th parallel. Both birds range to southern Africa and the intervening waters and the southern giant petrel extends to southern America.

PREFERRED HABITAT They nest on level ground of open coastal plateaus or headlands. Breeding sites include shores of the Antarctic continent, sub-Antarctic islands and various islands in the southern Indian Ocean. The northern giant petrel breeds on islands in the southern Indian Ocean and New Zealand region.

Photo – Leanne Thompson/DEC

Above: Southern giant petrel.

LIFE HISTORY These birds feed on fish but are also known to follow ships out to sea to feed on galley refuse. Quite active on land, they will make an easy meal of an unattended bird's nest or seal pup. Southern giant petrels breed in colonies of several hundred pairs from October to March.

CALL Both birds make a threatening 'hu-hu-hu-hu' sound. When trying to impress their mate they produce a cat-like mewing.

BANDED LANDRAIL

(*Rallus philippensis*)

The banded landrail is one of the most secretive and reclusive members of the rail family. Found singularly or in pairs, they are reluctant to fly. Instead, they avoid disturbances by following a network of tunnels they maintain under vegetation. Like most rails, they flick their tail when alarmed, a behaviour which has not been fully explained, though it may be the first thing to attract the attention of an observer. They can be seen on the southern and eastern beaches of Penguin Island and also on the grassed picnic area early in the morning or late in the afternoon.

DESCRIPTION These medium-sized birds have short legs and are sized about the same as a small domestic chicken, growing to about 30 centimetres in length. They have a distinctive grey eyebrow and an orange-brown band on a streaked breast. The eyes are red while the lores, cheek and hindneck are a rich chestnut. The chin and throat are grey, with the upper parts streaked brown and the underparts barred black and white.

OTHER NAMES Buff-banded rail, banded rail, corncrake, painted rail, pectoral rail.

STATUS AND DISTRIBUTION Banded landrails are widespread in mainland Australia, particularly along the eastern coast and islands, and on Norfolk and Lord Howe islands. They are also found in south-east Asia, New Guinea and New Zealand. Although some populations may be threatened, or even exterminated, by introduced predators, the species as a whole appears to be stable.

PREFERRED HABITAT They live in thickly vegetated swamps and lagoons, coral sand cays, mangroves, melaleuca swamps, coastal and sub-coastal regions.

LIFE HISTORY During the breeding season the birds become quite territorial, shrieking harshly day and night. They can breed at any time throughout the year if conditions are suitable, but generally from

Photo – Jiri Lochman

August to December. Nests are well concealed in dense vegetation, a depression in the ground lined with grass and leaves in tussock or sedge. Five to eight eggs are laid and incubated by both sexes for about 18 to 19 days, with healthy chicks becoming independent and feeding for themselves in the first week after leaving the nest. The banded landrail is an omnivorous scavenger which feeds on a range of aquatic, terrestrial invertebrates and small vertebrates, seeds, fallen fruit and other vegetable matter, as well as carrion and refuse.

CALL They generally call at dusk, emitting a loud creaky 'swit-swit'. When surprised or agitated, they utter a loud throat 'krek'. At nest, a soft low 'kik-kik-kik' can be heard.

BOTTLENOSE DOLPHIN

(*Tursiops truncatus*)

Bottlenose dolphins abound in the waters around Penguin Island. Take some time to look carefully over the water surface and you may see one of these magnificent creatures riding on the bow wave created by boats, surfing waves or leaping playfully into the air.

DESCRIPTION Like people, the bottlenose dolphin is an air-breathing mammal. Therefore, even though they have adapted to the marine environment, they still must come to the surface to breathe through the blow hole on the top of their heads. The dolphin has a grey back but its belly is a light-grey colour. This countershading helps camouflage the animal. As potential predators like killer whales and sharks look up from the deep, the light-grey belly blends in with bright surface waters. When looking from above, the grey back blends in with the deep dark waters below. Bottlenose dolphins have prominent dorsal fins, which can be seen slicing through the water. This fin is slightly hooked and set midway along the body. This playful mammal is also easily recognised by its well-formed melon and short, wide and rounded beak. The flippers are broad at the base and taper to a point. Bottlenose dolphins are very variable in size, depending on where they are found. The average length is three metres and calves are about a metre at birth.

STATUS AND DISTRIBUTION This species is common in cold, temperate and tropical seas and estuaries all over the world. It is often seen close inshore in estuaries, even entering rivers, and an offshore form is found in the open ocean. In some parts of the world bottlenose dolphins are killed for food.

LIFE HISTORY Bottlenose dolphins have a complex yet fascinating social structure. Within a population, they form small sub-groups which inhabit a defined home range. Members of a group, however, may change from time to time and they assist each other in activities such as fish herding and calf rearing. Even mating is a group activity – the males cooperate to herd a female in reproductive condition

Photo – Jin Lochman

and take turns to mate with her. They also try to prevent rival groups from having access to her. A calf is generally born 12 months later. Individuals live for 25 to 30 years and females begin to breed from about six years of age, calving every two or three years. The calves suckle for up to 18 months. Bottlenose dolphins eat a wide variety of fish, squid and octopuses. The offshore form may be able to dive to depths of more than 600 metres to catch food.

STRANDING HISTORY Bottlenose dolphins often strand, either singly or in small groups. Any strandings should be reported to the Department of Environment and Conservation.

AUSTRALIAN SEA LION

(*Neophoca cinerea*)

Australian sea lions are often seen lazing in the sun on islands off WA's coast. Seal Island is a favourite haul-out area for these majestic animals. Once heavily hunted for their meat and oil, they are now coming under increasing pressure from a rapidly expanding society.

DESCRIPTION Sea lions have a blunt, dog-like snout and small external earflaps. Males may reach about two metres long and weigh 300 kilograms. Their fur is a chocolate brown colour, with a creamy crown and neck. Females are silvery grey above and creamy yellow below. They are smaller than males, growing up to 1.5 metres and weighing about 80 kilograms.

STATUS AND DISTRIBUTION This animal is the rarest sea lion in the world, and the only one found solely in Australia. It is given special protection under WA's Wildlife Conservation Act as the entire population only numbers a few thousand animals. The Australian sea lion breeds and rests on offshore islands from the Abrolhos Islands, near Geraldton, to Pages Island, just east of Kangaroo Island in South Australia. Its range once extended east of Bass Strait before it was wiped out of the area by hunting.

LIFE HISTORY Sea lions use their quick powerful swimming ability and sharp teeth to catch food. Fishing excursions can last up to two days. Fish, squid, octopus, cuttlefish, small sharks and rock lobster form the basis of their varied diet. Their respiration is highly efficient, with up to 40 per cent of the lung capacity exchanged with each breath (people only exchange about 10 per cent). Sea lions also have greater blood volumes and greater concentrations of oxygen in the blood than non-diving mammals. They can greatly reduce their heart rate and control blood flow to only the vital organs. Such adaptations make the Australian sea lion a very efficient swimmer.

Australian sea lions on the west coast of WA exhibit an unusual breeding pattern. Breeding takes place on offshore islands about 200 kilometres north of Perth for four to five months every 18 months.

Photo – Kevin Crane/DEC

After the breeding season is over, the males migrate south to islands off the Perth metropolitan coast, probably to relieve feeding pressure on the females and young pups. As a result, the sea lions found at places such as Seal Island are all males. The cow and her pup develop a strong bond and the pup continues to take milk from its mother for 15 to 18 months after birth. While they are away fishing, mothers hide their pups under a bush or behind a rock. The mothers are extremely protective of their pups and intruders on breeding islands have sometimes been injured as a result. Australian sea lions are the only seals or sea lions in the world with an 18-month breeding cycle. This could be due to there being no appreciable difference between food availability in winter and summer in the waters where they live. Instead, mothers feed their pups over a longer period of time, which is an advantage in an environment low in food resources.

MARINE TURTLES

A number of turtles are occasionally seen in the waters near Penguin Island. Divers and boaters could be lucky enough to encounter them. In the winter months, baby loggerhead turtles (*Caretta caretta*) are often carried south from northern breeding areas by means of the Leeuwin Current. The youngsters usually have a shell length between 50 and 80 millimetres and are blown onto beaches between Perth and the south coast in storms.

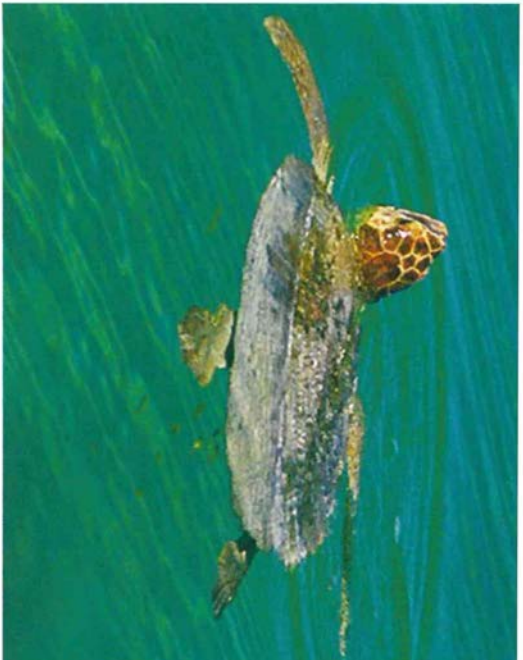
Loggerhead turtles reside in warm shallow seas and estuaries and they are found in Cockburn Sound. Large juveniles of between 40 and 50 kilograms, with shell lengths of between 65 to 70 centimetres and upwards have been recorded there. The biggest animal recorded in Cockburn Sound had a shell length of 110 centimetres and weighed 150 kilograms. However, loggerheads are quite scarce. When it is time to breed they swim north to mate and nest in areas such as Dirk Hartog Island in Shark Bay.

The largest of the marine turtles, leatherback turtles (*Dermochelys coriacea*), which have a distinctive ridged shell, are also found offshore and in Cockburn and Warnbro sounds in summertime. One even became entangled in a crab net in the Swan River. Jellyfish are one of the main food items of this species, and this individual would have survived quite well on the brown and white spotted jellyfish that live in the river. Leatherbacks also consume crustaceans and algae. Rather than having the large bony plates which protect the back and undersides of other turtles, they have thick leathery skin strengthened by small embedded bones. They have huge front flippers and are the fastest swimmers of all the marine turtles.

Juvenile green turtles (*Chelonia mydas*), weighing up to 30 kilograms, are sometimes seen off Rottnest in small numbers. Adult green turtles are herbivorous, unlike other marine turtles, which are carnivores, or omnivorous.

Photo – Babs and Bert Wells/DEC

Photo – Kevin Crane/DEC



KING'S SKINK

(*Egernia kingii*)

These large blackish to olive-brown reptiles are among the most visible animals on Penguin Island. If you hear a rustling noise in the undergrowth, check to see if it is caused by one of these handsome creatures.

DESCRIPTION King's skinks are covered with dark, shiny and quite fine scales. These are often attractively decorated with small white, cream or grey spots. The head is usually paler than the body. The undersides range from white, grey or olive-yellow in colour; while the tail is long, rounded and tapering. These animals have strong, thick bodies and relatively thickset legs, with long slender toes. They grow up to 40 centimetres.

STATUS AND DISTRIBUTION These skinks are widespread on islands throughout south-western WA. In addition to Penguin Island, these skinks are widespread on islands throughout south-western WA, including Rottnest and Garden islands. They are also found in mainland habitats such as jarrah forests and coastal heathlands, where they are found on granite outcrops and along streams.

LIFE HISTORY King's skinks on Penguin Island are often seen hunting for birds' eggs in the undergrowth or in caves. They also eat young birds and insects as well as the flowers of pigface and introduced dandelions. It is likely that introduced house mice found on the island are also taken. They will rummage through seaweed for other edible delicacies. Unlike many other reptiles, King's skinks give birth to live young, typically two at a time, which have prominent white spots which fade as they mature. Juveniles are often marked with distinct cream or yellow dashes and spots. As the animal matures, these tend to fade, although are still present in some populations in adults.

Photo – Babs and Bert Wells/DEC

Photo – Samille Mitchell/DEC

BLUE MANNA CRAB

(*Portunus pelagicus*)

Although this species is commonly known as the blue manna crab, the blue colouring is found only in the male. The female is sandy brown, but both females and males have extensive white markings. This bottom-dwelling carnivore will scavenge dead drifting food. However, most of its diet consists of bivalve molluscs, crustaceans, polychaete worms and brittle stars. Feeding activity is highest at sunset.

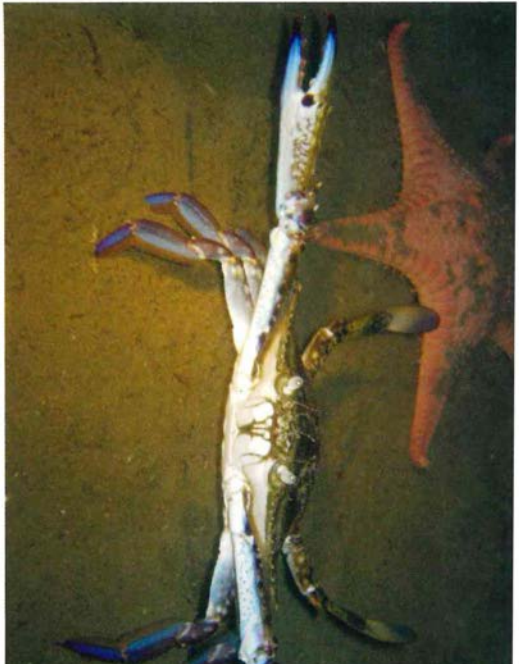
DESCRIPTION The claws are long and slender, and the fifth pair of legs has been modified to form a set of paddles used in swimming. Adult crabs usually weigh about 500 grams with a maximum weight of up to one kilogram.

STATUS AND DISTRIBUTION The blue manna crab is the only 10-legged crustacean found around the entire Australian continent. It is also found in East Africa, through the Indopacific islands to Japan and Tahiti.

LIFE HISTORY While the female blue manna mates only once a year, she has an extraordinarily high reproductive output. At a given time she may lay up to two million eggs. In WA the peak spawning period is in January and February. At this time, the female will leave the estuaries and rivers to release the eggs in the open ocean, a strategy which may help to broaden the distribution of the species. Mortality of these eggs is extremely high and less than one per cent will survive to make their way back to shallow coastal waters and rivers. Blue manna crabs appear to live up to three years. There are daily bag limits for catching the crabs and minimum legal sizes. All females carrying eggs must be thrown back into the water while they are still alive. Contact the Department of Fisheries for the latest rules and regulations. Follow a few common sense rules and blue manna crabs will be here to stay.

Photo – Babs and Bert Wells/DEC

Photo – John Huisman/DEC



WESTERN ROCK LOBSTER

(Panulirus cygnus)

Western rock lobsters, or crayfish, spend most of their lives among the limestone reefs and coral ledges off our coast. However, each year many juveniles undertake an arduous underwater crawl to the edge of the continental shelf, often in a synchronised mass exodus.

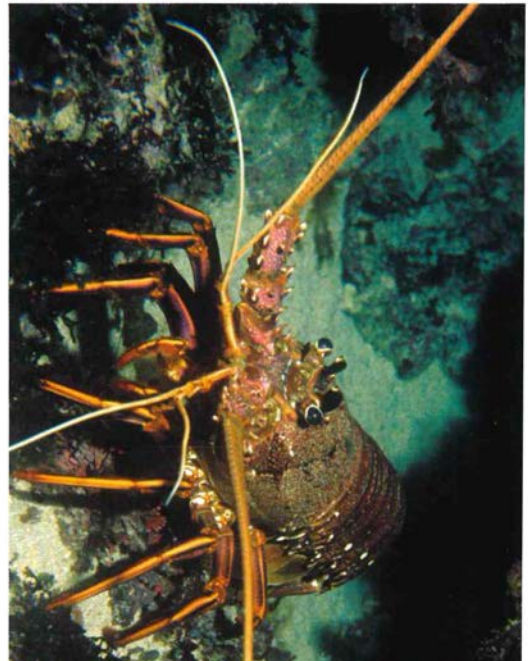
DESCRIPTION These large, usually dark-red animals have long feelers and have evolved defensive spikes and hard shells to deter potential predators. Despite this, their enemies are numerous and include octopus, large predatory fish such as dhufish and snapper, sharks and people. In late October to early November young rock lobsters moult their red shell to a light pink colour, then commonly called a 'white'. They have five pairs of legs, small black eyes on stalks and antennae to feel their way around.

STATUS AND DISTRIBUTION The western rock lobster is found only in WA, between North West Cape and Windy Harbour. It is common on limestone reefs, although mainly active by night.

LIFE HISTORY Western rock lobsters forage for molluscs, worms and small crustaceans, mostly at night. Mature females can carry up to one million eggs under their tail. When they hatch, larvae emerge and are released into the ocean. Over the next nine to 11 months, the larvae grow and moult many times before settling near the coast at a length of about two and a half centimetres. After about four years in the protective shelter of inshore reefs, newly moulted 'white' lobster migrate to deeper water, some to the edge of the continental shelf, to disperse into breeding stock areas. One individual tagged by Department of Fisheries scientists in 44 metres of water was caught 74 days later in 180 metres of water 280 kilometres away. a year or two after this migration. The lobster reaches sexual maturity a year or two after this migration. Rock lobsters support an important commercial fishery. Amateur fishers must have a licence that covers a defined season, so ensure you comply with current fishing regulations.

Photo – John Huisman/DEC

Photo – John Butler/Lochman Transparencies



ROE'S ABALONE

(*Haliotis roei*)

Roe's abalone is common on the reefs around Penguin Island. The ear-shaped shell often has a rough, pinkish exterior, but the inside layer is very beautiful, with a pearly texture and lustrous silvery appearance. These shells are often washed up on the beach.

DESCRIPTION These molluscs have a flattish, ear-shaped shell that grows up to 12.5 centimetres long. Each animal has a row of small holes near the edge of the rough, spirally coiled shell. The shell is often covered with algae when the animal is alive. The animal itself has a head with tentacles and eyes and a large flattened foot.

OTHER NAMES Ear shell.

STATUS AND DISTRIBUTION Roe's abalone is found from Shark Bay in WA to western Victoria. They inhabit shallow intertidal platforms up to four metres deep, preferring exposed rough water areas, where currents generated by wave action or tides increase the chance of bits of weed brushing past their mouth.

LIFE HISTORY Abalone cling to wave-tossed reefs with their adhesive muscular foot. They are capable of movement but generally stay put. Roe's abalone is capable of spawning all year round but in WA it does so mainly between July and December. Adult abalone will often congregate when spawning. Releasing the eggs and sperm in the same area greatly increases the chances of fertilisation. The larvae swim freely in the open ocean for several days before settling, generally on coralline algae. The holes in the algae provide both shelter and nutrition. Adult abalone scrape algae from rocks and consume pieces of drifting weed. They may live up to 10 years. Roe's abalone is taken by both commercial and amateur fishers under licence within a defined season. If you plan to take them please ensure you are familiar with the current fishing regulations and comply with them to help preserve populations of the species.

Photo – Andrew Davoll/Lochman Transparencies

SEA ANEMONES

Sea anemones are carnivores that take an unusual guise. Their beautiful flower-like tentacles have a sinister purpose. Fish, snails or crabs that blunder into these waving fronds are soon paralysed by the stinging tentacles, engulfed by the central mouth and digested within the tube-like body. Anemones are usually brightly coloured, adopting shades of white, green, blue, orange, red or mauve.

DESCRIPTION The most common anemone around Penguin Island is the cherry anemone (*Actinia tenebrosa*), a brilliant red animal that withdraws its tentacles when the tide is out, resembling a cherry. This species produces fully developed young through its mouth, which usually attach themselves to a rock near the parent. As a result they are often seen in groups.

HABITAT Anemones usually attach themselves to rocks and underwater structures, although some species burrow into mud or sand.

LIFE HISTORY These animals are generally seen fixed to reefs and other structures by the muscular disc at the base of the body. Though they usually move very little, they can creep along the bottom or may detach themselves and swim off. Anemones are closely related to jellyfish. The body is a tube-like column, which is divided internally into a number of partitions containing the digestive organs, muscles and gonads. Waste is excreted through the mouth, which is situated at the top of the body in the centre of the long tentacles.

Photo – John Huisman/DEC

SEA URCHINS

Heart urchins and sand dollars are just some of the many species of sea urchins found near Penguin Island. These unusual animals provide an endless source of fascination. They have a skeletal shell, known as a test, which is often found washed up on the beach after the animal has died and the spines have broken off.

DESCRIPTION Sand dollars are so-named because they are exceptionally flat and usually circular. Heart urchins are irregularly shaped but are rarely seen alive as they bury themselves in the sea floor. Sea urchin spines protect them from predators. Some species also use the spines on the underside to move around, making them look like they are walking on stilts. One species found near the island attaches bits of shell to itself at low tide, possibly to protect itself from the sun. The mouth is always on the bottom of the body. Many species have massive jaw-like structures known as Aristotle's lanterns, but only the tip of the teeth are usually visible.

HABITAT Sea urchins are most common in intertidal habitats and on shallow reefs, but have been found as deep as 7,000 metres.

LIFE HISTORY These animals are closely related to starfish, sharing the same five-fold symmetry, and they too move about on hundreds of hydraulically operated tube feet. Starfish and sea urchins are from a group known as echinoderms, a word meaning 'spiny skins'. Sea urchins use their teeth to scrape up kelp and other forms of algae that form the bulk of their diet. Due to their ability to reproduce rapidly when conditions become favourable, they can reach plague proportions and have a devastating effect on certain marine environments. People are one of their main predators. In some parts of the world sea urchins are believed to be powerful aphrodisiacs. The roe is a prized delicacy in Japan, in islands of the Pacific and in European countries such as France, Italy and Greece.

Photo – John Huisman/DEC

Above: Sand dollar.

Below: Sea urchin.

Photo – Duncan Dodd

OCTOPUSES

The name octopus comes from (the order) 'Octopoda', which (in Greek) means 'eight-footed'. All octopuses have eight arms. They are molluscs and, along with their close relatives the squids and cuttlefish, are the most highly developed invertebrates, with a well-developed brain and eye structure. On Penguin Island, at least two species of small octopuses can sometimes be seen in rock pools.

The common octopus (*Octopus* sp.) has no hard parts, except its beak. When disturbed or attacked, octopuses will eject a cloud of ink which will hopefully distract the predator so they can escape. They usually crawl along the sea floor but are capable of swimming for short distances by forcing water through their bodies. They are usually well camouflaged and can change colour to merge into their surroundings.

They are bottom-dwelling creatures and hide themselves under rocks and other debris and in crevices. A pile of recently dead shells is usually a tell-tale sign of their lair. Most octopuses have short lives and only live a year or so.

One small but colourful creature to be wary of is the blue-ringed octopus (*Hapalochlaena maculosa*). It kills its prey with a potent toxin injected with the bite, and, although such cases are very rare, has killed people. The toxin causes paralysis and respiratory failure.

Blue-ringed octopuses grow up to 12 centimetres across, living in reef flats and tidal pools. They can be recognised by their brilliant blue rings when disturbed. Be cautious when handling dead shells, or discarded cans and bottles, and when exploring tidal pools or underwater crevices and caves. If you are unlucky enough to be bitten you should keep the injured limb still, put direct pressure on the wound and seek medical aid urgently.

Photo – Ian Herford/DEC

Photo – John Huisman/DEC

SEAGRASSES

Seagrasses provide an important food source and shelter for marine organisms. As you cross to Penguin Island, look below the surface at these carpets of life.

DESCRIPTION Unlike seaweed, seagrasses are true flowering plants that have a root system that grows on and stabilises sand. The seagrass meadows around Penguin Island are mainly ribbon weed (*Posidonia* spp.) and wireweed (*Amphibolis* spp.), though *Halophila ovalis* and *Heterozostera tasmanica* are also common. Ribbon weed has long ribbon-like leaves that provide a handy attachment point for many plants and animals. They have an extensive rhizome root system, with up to 90 per cent of the plant below the sand. Wireweed has branched woody upright stems up to two metres long, with clusters of leaves at the end of each branch.

STATUS AND DISTRIBUTION Seagrasses grow in sheltered and shallow waters throughout the world, except for Antarctica. About 50 species of seagrass grow worldwide. Australia has 31 species, more than any other continent, and 14 of these grow in the Perth region.

LIFE HISTORY Ribbon weed produces flowers with both male and female parts which produce floating fleshy fruits from December to January, found on beaches within Shoalwater Islands Marine Park. Wireweed has separate male and female flowers. The male flower releases pollen into the water column, which drifts until reaching a female flower. The seedling then grows on the parent plant for several months until it breaks away to form a separate plant.

ECOLOGICAL ROLE Seagrass meadows provide an important food source and habitat for many animals and help stabilise the sea floor. They attract a wide range of animals, such as tiny worms, molluscs, echinoderms and crustaceans, in turn attracting larger animals, creating a complex food web. The importance of this cannot be underestimated. Seagrass beds provide nursery areas for many commercially important species, including rock lobster, prawns and herring.

Photo – Michael James/DEC

SIGHTING RECORD

Species	Date	Locality	
little penguin			
Australian pelican			
silver gull			
crested tern			
Caspian tern			
bridled tern			
pied cormorant			
oystercatchers			
banded landrail			
giant petrels			
bottlenose dolphin			
Australian sea lion			
marine turtles			
King's skink			
blue manna crab			
western rock lobster			
Roe's abalone			
sea anemones			
sea urchins			
octopuses			
seagrasses			

Remarks

INDEX

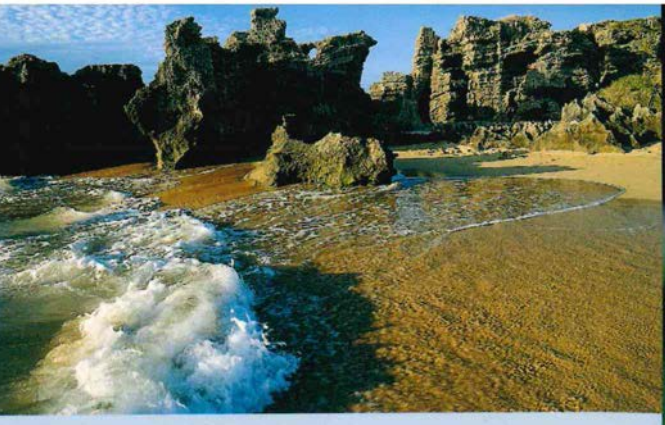
Photo – Dave Leirich/DEC

OTHER BOOKS IN THIS SERIES

Discovering Shark Bay Marine Park and Monkey Mia
Discovering Yanchep National Park
Discovering Nambung National Park
Discovering the Swan River and the Swan Estuary Marine Park
Discovering Leeuwin-Naturaliste National Park
Discovering the Walpole Wilderness and the Valley of the Giants
Discovering Two Peoples Bay Nature Reserve
Discovering Caves of Western Australia
Discovering karri forests of Western Australia

Visit DEC's online bookshop at www.dec.wa.gov.au/shop

2008505-1209-3000



Discovering books are a series of Department of Environment and Conservation publications designed to help you explore an area's natural wonders.

This publication helps you learn about the natural environment of Penguin Island and the Shoalwater Islands Marine Park.

ISBN 978-1-921-703-01-0

Department of
Environment and Conservation