

A Beachcomber's guide to plants and animals

in South Australia's Marine Parks



**IMMERSE
YOURSELF**
in a Marine
Park



It is fascinating what flotsam washes up onto our beaches, some of it can travel long distances on ocean currents. It can be pushed by wind and wave action, carried from offshore islands, reefs and seagrass beds. This guide will help you identify some of what you may find when beachcombing the shores of South Australia's marine parks. Remember to take only photos and leave only footprints. Enjoy!

Fishes and birds



Photo: © CSIRO Australia

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Globefish / slender-spined porcupinefish *Diodon nichthemerus*

These spiny, poisonous fishes are occasionally washed up on beaches, and should be avoided as they are poisonous. In some years, when there are long periods of hot, calm weather, algal blooms deplete the oxygen in nearshore waters, and globefish and pufferfish wash up in greater numbers than at other times.



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Smooth toadfish *Tetractenos glaber*

This species of pufferfish occasionally washes up on beaches. Their flesh is poisonous and unfit for human consumption. In some years, when there are long periods of hot, calm weather, algal blooms deplete the oxygen in nearshore waters, and toadfishes wash up in greater numbers than at other times.



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Seabirds

Fish-eating seabirds such as cormorants, terns and penguins occasionally wash up dead on beaches. This can be due to natural causes (e.g. end of life), or from disease, injury (e.g. from eating plastic or becoming entangled in it), or from exhaustion after flying (in the case of terns and gulls), or swimming (e.g. penguins, cormorants) during storms.



Shark and skate eggs



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Port Jackson shark egg case

The Port Jackson shark is a common type of bullhead shark which lives on the seafloor in various habitats across southern Australia. Female Port Jackson sharks lay brown, spiral egg cases, and wedge them into rock crevices. The egg cases harden, and stay in the crevice for up to year. Sometimes egg cases get dislodged before the baby shark can fully develop, and wash up onto beaches adjacent to reefs.



Photo: © J. Baker, CC BY Attribution

Skate egg cases

Skates are a type of ray, with a square-shaped body and a thin tail. Most species live over sand or mud bottoms, but some are found over seagrass, or near patchy reef in sandy areas. Female skates lay flat, brown, rectangular egg cases which have horns at both ends. These sometimes wash up on beaches, and are commonly known as “mermaids’ purses”.



Photo: © M. Bossley, CC BY Attribution

Elephantfish / elephant shark egg case

Elephantfishes are unusual animals which have features of both bony fishes and sharks. They live for most of the year in deeper waters of the continental shelf, but females move to shallow bays after breeding, and lay pairs of leathery eggs cases. The baby elephantfish inside the egg case hatches after about 8 months, but sometimes the cases are washed up on beaches after storms, before the young can hatch.

Molluscs



Photo: © J. Delsing, @ Wikimedia Commons

Abalone, such as blacklip abalone *H. ruber*, and staircase abalone / ridged ear shell *Haliotis scalaris*

Abalone are flat shells with holes along the side, to assist breathing. The inside of the shell has a pearly lining. These animals have a large, muscular foot, which are eaten and considered a delicacy in some cultures. The foot helps the abalone to clamp tightly to rocks so that they are not dislodged by waves. The shells sometimes wash up on to beaches. This can happen after storms, or after the animal has been eaten by a predator, such as a lobster, octopus, wrasse fish, or stingray.



Photo: Public Domain

Brown bubble snail *Bulla quoyii*

Bubble snails live in intertidal areas, and also in shallow sediments below the tide line. They often remain hidden in sand during the day, and come out at night, to feed on algae. They are occasionally found in seaweed on rocky shores. Brown bubble snails grow to about 6cm long, and the empty shells are sometimes washed up onto wave-sheltered beaches in bays and coves.



Photo: © J. Baker, CC BY Attribution

Moon snail *Polinices* species

Moon snails are active predators in intertidal areas, making trails through the sand as they search for small bivalve shells to capture and eat. The moon snail holds the prey with its muscular foot, and drills a hole in the shell using its teeth (radula), assisted by acid. The moon snail then extracts the soft animal inside and consumes it.



Photo: © M. Bossley, CC BY Attribution

Moon snail egg mass

Polinices egg mass / 'sausage blubber'

Moon snails lay tiny eggs encased in a clear, jelly-like, 'C'-shaped mass. These masses are often found in summer on beaches where *Polinices* moon snails live. The jelly masses are commonly called 'sausage blubbers', and break down very easily due to wave and sand movement.



Photo: © J. Baker, CC BY Attribution

Turban shells

Turbo undulatus and *Turbo torquatus*

Round, edible snails which have a dark green and white zig-zag pattern on the shell, often masked by a thin, transparent brown coating. Turban shells are found in large numbers on many reefs. The white "trapdoor" (operculum) which protects the soft animal inside, is often washed up on southern beaches, along with the empty turban shells.



Photo: © S. Johnson, CC BY Attribution

WARNING!
Cone shells are
venomous and
some species are
dangerous to
humans

Cone shell *Conus anemone*

A predatory cone shell which is common on reefs around southern Australia. Cone shells have a harpoon which they use to stab prey such as worms. This shell sometimes washes up on beaches adjacent to reefs in wave-exposed areas. In some locations, many juveniles may be found on the shore.



Photo: © J. Baker, CC BY Attribution

Bivalve shells

There are many kinds of bivalve shells which live in beach sand, and in sandy habitats below the tide line. Bivalves feed by extracting tiny food particles out of the water. In addition to those listed in other sections, some other examples of bivalve shells which commonly wash up on sandy shores include nut shells, dog cockles, brooch shells, lunicid shells, trough shells, wedge shells, venus shells, tellin shells, and the native oyster.

6 Invertebrates



Photo: © J. Baker, CC BY Attribution

Goolwa cockle / pipi *Donax deltoides*

The Goolwa cockle is an abundant, commercially significant species found on ocean beaches around Australia. In South Australia, it is most abundant on the ocean beaches near the Coorong. The empty shells are sometimes found on beaches where cockles do not live, because many fishers use this species for bait, and discard the shells at the site where they are fishing.



Photo: © P. Hall, CC BY Attribution

Razorfish shell *Pinna bicolor*

Razorfish grow to around 50cm long, and are broadly distributed in tropical, subtropical and temperate waters. This bivalve can live for around 15 years, and occurs in sandy and muddy sediments. Razorfish sometimes have many other small animals and plants growing on them, and thus act as 'mini reefs'. The empty shells often wash up on beaches, but rarely are two halves of the shell found intact.



Photo: © J. Baker, CC BY Attribution

Scallops, such as king scallop *Pecten fumatus* and queen scallop *Equichlamys bifrons*

There are several common species of fan-shaped scallops in South Australia, and some of these are highly regarded as food sources. A few of the scallop species occur in sand, and others are found attached to reefs and other hard surfaces. Scallops have two shells joined by a ligament in the middle, but usually only one of the shells washes up on beaches. It is rare to find both shells still attached and intact.



Mussels (e.g. species in *Brachidontes* and *Mytilus*)

Mussels usually live in groups between and below the tide line, attached to hard surfaces by strong threads. Mussels can also live individually on seaweeds. They have many adaptations to help them survive in harsh intertidal habitats, but are sometimes washed up on shore, often with other shells.

Photo: © L. Altoff, CC BY Attribution

Cephalopods

(Squids, cuttlefish and octopus)c



Photo: © M. Bossley, CC BY Attribution

Southern calamary / squid eggs

Sepioteuthis australis

The large, fast-swimming, southern calamary squid is commonly found throughout South Australia coastal waters, over reefs, seagrass beds, and sandy habitats in shallow waters. The females lay clumps of white, finger-like eggs on seagrass and seaweed. These are sometimes washed ashore after rough weather.



Photo: © M. Bossley, CC BY Attribution

Cuttlefish 'bones' (Giant cuttlefish *Sepia apama* and other species in *Sepia*)

Cuttlefish are very advanced, soft-bodied animals which have 8 arms, plus 2 long tentacles to help in food capture. They have an internal shell (cuttlebone) which helps to control buoyancy. There are various cuttlefish species in South Australia, but the most common in the shallows is *Sepia apama*. Cuttlebones from both juvenile and adult cuttlefishes common wash up on shores. Some of these have bite marks from dolphins and other animals.



Photo: © Mgiganteus1 @ The English Language Wikipedia, CC BY-SA 3.0

Paper 'nautilus' / argonaut egg case

Argonauta nodosa

Argonaut octopus live in the open ocean, from the shallows to around 100m deep. The female creates a sculptured case using membranes in her arms. The delicate case protects the eggs whilst they develop, and the female stays in the case during that time. Empty egg cases are sometimes washed ashore after winter storms.

Other invertebrates



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Moon jelly *Aurelia aurita*, and other circular sea jellyfish

Jellyfish are usually found in open waters away from the coast, but some species are also common inshore, especially in summer. Most jellyfish species have stinging tentacles. These delicate transparent animals are often washed ashore after storms, and rapidly dry out and break down on beaches.



Photo: © Jymm @ Wikimedia Commons

By-the-wind-sailor *Velela velela*

A small, jelly-like animal which is related to stalked hydroids, not to the jellyfish. Each blue polyp has a disc-like float with a transparent 'sail', which enables the animal to drift around the ocean surface. By-the-wind-sailors sometimes wash up in large numbers on beaches.



Photo: © J. Baker, CC BY Attribution

Sponges (various species)

Sponges are simple animals, which have a skeleton made up of a fibrous material called spongin, usually strengthened with glass-like spicules. Sponges pump water through pores in their structure, to extract food, and expel the waste water through larger holes called osculae. Sponges of many different shapes and sizes are washed up on some beaches after storms, including sponges shaped like wine glasses, fingers, balls, or flat spiky mats.



Photo: © J. Baker, CC BY Attribution

Green coral *Plesiastrea versipora*

One of the very few hard coral species in southern Australia, Green coral is a slow growing species which can form flat, plate-like structures on reefs in shallow waters, and larger spherical structures in deeper waters. Green coral has a hard calcareous skeleton, and the soft coral polyps live inside circular pits in the skeleton. The hard skeleton is sometimes washed up on beaches, after pieces of coral break off from offshore reefs during storms.



Photo: © J. Baker, CC BY Attribution

Bryozoans

Bryozoans are composed of very small animals called zooids, which live closely together in colonies. The body walls of many species are calcified to form a hard, coral-like skeleton. Bryozoans live in many environments, especially on reefs, and on seagrass and seaweed. They are often dislodged, and when the colonies die and break down, the hard pieces of skeleton form a significant component of beach sand in southern Australia.



Photo: © J. Baker, CC BY Attribution

Sea urchin e.g. *Heliocidaris erythrogramma*, and *amblypneustes* species

Sea urchins are spiny animals which have a calcareous body known as a 'test'. They have sharp teeth in their mouth for grazing algae, and rows of small tube feet to help them move. There are several common species of sea urchin in South Australia, and these are often found on reef or rubble, and in seagrasses or seaweed. When sea urchins are washed away from their habitat after rough weather, they often lose the spines, and float ashore as empty tests.



Photo: © M. Bossley, CC BY Attribution

Compound ascidians such as *Botrylloides* and *Botryllus* species

Compound ascidians are made up of very small animals (zooids) living together in a jelly-like matrix. The zooids produce distasteful chemicals to prevent the colony being eaten. Some species are very fast-growing, and highly variable in colour. Species in the genera *Botrylloides* and *Botryllus* were probably introduced to southern Australia by shipping, and are now widespread. They commonly wash up on beaches after storms, attached to pieces of seagrass or seaweed.



Photo: © M. Norman, Museum Victoria
Photo: © A. Gackle, CC BY Attribution

Solitary ascidians such as red-mouthed ascidians *Herdmania* species, and southern sea tulip *Pyura australis*

Solitary ascidians have a tough, jelly-like body with two openings (siphons), one of which draws in water with tiny food particles, and the other which expels wastes. Solitary ascidians are also known as 'sea squirts'. They live on reefs, but are sometimes found washed up on adjacent sand beaches after rough weather. The stalked ascidians are commonly called 'sea tulips'.



Photo: © Museum Victoria, CC BY Attribution

Seaweed crab *Naxia* species

There are several species of *Naxia* decorator crab in seagrass beds and on reefs in South Australia, and they often stick pieces of algae, seagrass, or sponges on the pear-shaped body (carapace) for camouflage. Crabs shed their carapace periodically when they grow. The empty carapace is sometimes washed up on beaches.



Photo: © sunphlo @ Flickr CC BY-NC 2.0

Surf crab / sand crab *Ovalipes australiensis*

Surf crabs are found in shallow waters off sandy beaches around southern Australia. They grow to around 10cm wide, and have two distinctive dark red patches on the shell (carapace). The shell is discarded and replaced as the crab grows, and the empty carapace is often found on sandy beaches adjacent to the shallows where these crabs feed and breed.



Photo: © Cordyceps @ Flickr, CC BY-NC-SA 2.0

Amphipods, such as species in *Notorchestia* and *Bellorchestia* species

Amphipods are small crustaceans, and some species, known as 'sand hoppers', live in intertidal sand. Others feed on the drift seaweed which washes up. Amphipods are important food for shallow water fishes, and are also eaten by some of the smaller shorebirds, such as dotterels.



Photo: © K. Williamson, CC BY-SA 2.0

Lugworms family *Arenocolidae*

Various kinds of worms live in beach sand, and feed on microscopic food particles. Most are not seen at the surface, and remain in the burrows which they dig. When lugworms burrow, they produce casts of coiled sand and mucus, and these are often seen on the surface of beach sand in the intertidal zone.

Seagrasses



Photo: © J. Baker, CC BY Attribution

Wireweed *Amphibolis* species

There are two species of the wireweed seagrass *Amphibolis* in South Australia. *Amphibolis antarctica* has short, twisted leaves, and *A. griffithi* has longer, straighter leaves. Plants are sometimes washed up on to beaches after rough weather, which dislodges the roots from sand in the shallow waters. The tough, wiry stems of uprooted plants sometimes roll together via wave action, to form basket-like 'wireweed balls', but these are less common than another type of seagrass ball (see *Posidonia*).



Photo option: © M. Bossley, CC BY Attribution

Tapeweed / strapweed *Posidonia* species

Tapeweed is a long, strap-like seagrass which forms meadows in nearshore sand areas. Most of the world's species of *Posidonia* are found in South Australia, and some of these form large meadows, especially in the gulfs, and in the bays of the west coast. *Posidonia* meadows have many important ecological functions, such as providing feeding and breeding grounds for many marine fishes, crustaceans, and other animals; protecting the coast from erosion; and helping to keep coastal waters clean. Seasonally, the leaves are shed in storms, and wash up on beaches as beach wrack.



Photo: © J. Baker, CC BY Attribution

Seagrass and seaweed (macroalgae) beach wrack

When seagrass and seaweed plants break down in rough weather and winter storms, they are washed up on beaches, and known as 'beach wrack'. The decaying plants are an important source of nutrients for the nearshore environment, and are major recycling route for carbon, which is essential to life. Flies and small crustaceans (beach hoppers) live in the beach wrack, and are eaten by shorebirds. Some birds, such as the threatened hooded plover, also nest in beach wrack.



Photo: © M. Fagg at Australian Plant Image
Index: <http://www.anbg.gov.au/photo>

Tapeweed fibre balls *Posidonia*

Posidonia tapeweed has strong, fibrous leaves with veins, and also fibrous, stem-like structures called rhizomes, which are attached to the roots, and can form stabilising mats under the sand. When the leaves and rhizomes break down, the fibres can roll together in the waves to form balls. In some wave-exposed beach areas, these fibre balls can be as big as soccer balls. The fibre balls are sometimes sausage-shaped, instead of spherical.



Photo: © J. Baker, CC BY Attribution

Tapeweed fruits *Posidonia* seagrass

Strapweed plants produce spike-shaped clusters of flowers which develop into green, bean-shaped fruits. These are released seasonally and can float a long distance away from the parent plants, enabling new *Posidonia* plants to grow in other sandy habitats near shore. The green fruits of *Posidonia*, known in some countries as 'olives of the sea', are commonly washed up on beaches in late spring and early summer.



Photo: © M. Bossley, CC BY Attribution

Paddle weed *Halophila* species

Paddle weed is a delicate seagrass with oval-shaped leaves which grow from branched stems called stolons. This seagrass is found in sheltered waters on sand and mud. The stolons are sometimes dislodged from the seafloor after storms, and the plants wash ashore.



Photo: © J. Finn, Museum Victoria,
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Eelgrass / Australian grass-wrack *Zostera* / *Heterozostera* species

Eelgrasses are short plants which have narrow leaves. Some eelgrasses grow in shallow subtidal sand, and others grow near the mouth of estuaries. The plants sometimes wash up on adjacent beaches, and become part of the beach wrack. Sometimes eelgrass is found tangled up with larger quantities of other seagrass species in the beach wrack.

Seaweeds



Photo: © J. Baker, CC BY Attribution

String kelp or northern giant kelp *Macrocystis angustifolia*

A large seaweed, closely related to the giant kelp *Macrocystis pyrifera*. String kelp is found in cooler waters of south-eastern Australia. It grows to about 10m long, and has air-filled floats which help the long, heavy fronds stay buoyant in the water. String kelp forms an important habitat for numerous fishes, crustaceans and echinoderms in south-eastern South Australia. In the south east of South Australia, the large, heavy plants are sometimes washed up onto beaches, after storms.



Photo: © M. Norman, Museum Victoria, CC BY Attribution

Sinuuous ballweed / brown bubbles *Colpomenia sinuosa*

A hollow, yellow-brown coloured seaweed which is common on intertidal reefs, and also just below tide level. It often grows on other seaweeds, and on seagrasses. *Colpomenia* is only lightly attached to the surface, so is easily dislodged by wave action, and washes up on beaches.



Photo: © J. Baker, CC BY Attribution

Branching brown seaweeds, such as species in *Cystophora* and *Sargassum*; corkweed *Scaberia agardhii*, and forkweeds *Scytothalia dorycarpa* and *Seirococcus axillaris*:

There are many brown seaweeds on reefs in South Australia. Some plants break off the reefs during rough weather, and other plants seasonally shed the branches (laterals). Many brown seaweeds have hollow floats called vesicles, which enable the plants to stay upright in the water. The floats also help the plants raft along the sea surface after they are dislodged.



Photo: © M. Lorenz, CC BY Attribution

Sea lettuce *Ulva* species

Several common species of thin, sheet-like green seaweeds grow abundantly in summer when waters are warmer, and also in areas with high nutrient input into the nearshore environment. These are easily dislodged from the sea floor and are often washed up onto sandy shores.



Photo: © J. Baker, CC BY Attribution

Red grapeweed *Botryocladia sonderi*

Found on shallow reefs across southern Australia. This red species has dense, grape-like clusters on the branches. The bladders are filled with a gelatinous substance when the plant is young, but in older branches, holes develop at the end of each bladder and they become hollow. Grapeweed may be dislodged from reefs after storms, and the bleached plants with empty bladders sometimes wash up on beaches.



Photo: © J. Baker, CC BY Attribution

Bleached red seaweeds, such as species in *Plocamium* and *Callophyllis*, *Hypnea ramentacea*, and numerous others

There are many species of red seaweed in South Australia, especially in wave-exposed coastal waters. Red seaweeds often wash up on beaches, especially in the south east of South Australia, after rough weather. Sometimes the red pigments have been bleached out of the dislodged plants, turning them bright pink, or even white.



Photo: © J. Baker, CC BY Attribution

Coralline algae

Coralline algae are seaweeds with calcium carbonate in the structure, so they are brittle, and can break easily. Some have branches, such as the shore coralline *Corallina officinalis*, and others are flat, such as *Lithothamnion*, and look like hard pink crusts on rocks.



Photo: © K. Peters / Fabelfroh,
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Codium species

Various species of green *Codium* seaweed are abundant on wave-exposed reefs in South Australia. *Codium* have a core of fine filaments, with an outer layer of thousands of small, succulent, cell-like structures called utricles. Some species are spherical, and others have many branches. They are sometimes washed up onto beaches after storms.

All plants and animals are protected in marine park sanctuary zones. Sanctuary zones are just like national parks of the sea and are no-take areas. Remember it is also illegal to remove any bottom dwelling organisms from any intertidal rocky reef in South Australia.

Useful links

Marine parks information including sanctuary zone maps and coordinates:
www.marineparks.sa.gov.au

Intertidal rocky reef information:
www.pir.sa.gov.au/fishing/closures_and_aquatic_reserves/fishing_closures/intertidal_reefs

SA recreational fishing guide app:
www.pir.sa.gov.au/fisheries/recreational_fishing/recfishingapp



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