GOVERNMENT OF WESTERN AUSTRALIA

Department of
Primary Industries and Regional Development

Coastwest

Beachcombers Field Guide

Acknowledgements

The *Beachcombers Field Guide* has been made possible through funding from Coastwest and the Western Australian Planning Commission, and the Fisheries Division at the Department of Primary Industries and Regional Development.

The project would not have been possible without our community partners – Friends of Marmion Marine Park and Padbury Senior High School.

Special thanks to Sue Morrison, Jane Fromont, Andrew Hosie and Shirley Slack-Smith from the Western Australian Museum and John Huisman for editing the field guide.

Department of
Primary Industries and Regional Development

The *Beachcombers Field Guide* is an easy to use identification tool that describes some of the more common items you may find while beachcombing.

For easy reference, items are split into five simple groups:

- Chordates (mainly vertebrates – animals with a backbone);
- Invertebrates (animals without a backbone);
- Seagrasses and algae;
- Unusual finds; and
- Marine pests!

Chordates and invertebrates are then split into their relevant phylum and class. Phyla include:

- Chordata (e.g. fish)
- Porifera (sponges)
- Bryozoa (e.g. lace corals)
- Mollusca (e.g. snails)
- Cnidaria (e.g. sea jellies)
- Arthropoda (e.g. crabs)
- Annelida (e.g. tube worms)
- Echinodermata (e.g. sea stars)

Beachcombing Basics

- Wear sun protective clothing, including a hat and sunscreen.
- Take a bottle of water – it can get hot out in the sun!
- Take a hand lens or magnifying glass for closer inspection.
- Be careful when picking items up – you never know what could be hiding inside, or what might sting you!
- Help the environment and take any rubbish safely home with you – recycle or place it in the bin.
- Take your camera to help you to capture memories of your finds.
- Leave marine life on the beach where you found it – each plant and animal plays an important part in the environment.
- Leave only your footprints...

It is always important to be prepared, so you can make the most of your beachcombing experience

Photo: Cottesloe Coastcare

Globefish

Globefish (*Diodon nicthemerus*)
Chordata – Osteichthyes

Also referred to as a porcupinefish, the name certainly reflects this fish's appearance with a body that can be inflated, causing the spines (which are modified scales) to stand erect. A globefish inflates its body by ingesting water or air, and as its body expands the spines lock into place – making the animal appear much bigger and acting as a deterrent to potential predators.

Photo: Carina Gemignani

Did you know?

The swim bladder of the porcupinefish may also be found washed up onto the beach – the inflated dried organ is sometimes referred to as a windbag.

Weeping toadfish

Weeping toadfish
(*Torquigener pleurogramma*)

Chordata – Osteichthyes

Commonly referred to as a blowie, these pufferfish are considered to be a nuisance to recreational fishers because they gobble up bait, making it hard for fishers to catch other species. However, blowies play an important role in marine ecosystems, as they are omnivorous (plant- and animal-eaters) and feed on almost anything they can scavenge. They consume waste scraps, bait and burley along with its normal diet, and therefore help to keep our coastal waters clean.

Photo: Henrique Kwong

Did you know?

Pufferfish produce a highly lethal toxin called tetrodotoxin – present in their skin, flesh and internal organs. Do not allow dogs to mouth any dead fish, as they can ingest sufficient toxin to kill them.

Shaw's cowfish

Shaw's cowfish (*Aracana aurita*)
Chordata – Osteichthyes

Shaw's cowfish belong to the boxfish family. Unlike most other bony fishes, boxfish have an outer covering of large, thick bony plates, that provide a protective armour against predators. Because of this armour, boxfish cannot swim very fast to hunt, so they feed by blowing a jet of water at the sand to expose prey hidden beneath.

Photo: Carina Gemignani

Did you know?

Boxfish are one of the bony fish families that display sexual dimorphism. This means that you can tell the difference between males and females by the colours, patterns and markings on their bodies.

Photo: Sandy Clarke

Common seadragon

Common seadragon
(*Phyllopteryx taeniolatus*)

Chordata – Osteichthyes

Although in the same family (Syngnathidae), the common seadragon is sometimes confused with the seahorse, however, seadragons don't have a prehensile tail (one with the ability to grasp onto objects). The common seadragon is only found in temperate waters of southern Australia. Growing up to 46 cm in length, the armour-coated body can sometimes be found washed up onto the beach by a lucky beachcomber.

Photo: Shannon Conway

Did you know?

Closely related to the common seadragon is the leafy seadragon. This species of seadragon is generally yellow to brown in colour and has more leaf-like appendages on its body. This makes it incredibly well camouflaged among marine algae.

Photo: Sandy Clarke

West Australian seahorse

West Australian seahorse
(*Hippocampus subelongatus*)

Chordata – Osteichthyes

Seahorses have bony plates protecting their bodies instead of scales. Their long snouts end in tiny, toothless mouths that suck in minute crustaceans, which are swallowed whole. The West Australian seahorse varies in colour but can be distinguished by a series of brown lines across the snout. Growing to about 22 cm in length, they are found in sheltered reefs, sponge gardens and seagrass beds in a limited area of the south west of Western Australia.

Photo: Sandy Clarke

Did you know?

Most species of seahorse live in pairs. Female seahorses pass their eggs to the males, who incubate them in a protective pouch. He later 'gives birth' to highly developed offspring.

Sea squirt

Sea squirt
Chordata – Ascidiacea

Attached to the reef, sea squirts (or ascidians) are often mistaken for sponges. These simple animals are practically a 'sac' with two openings that siphon water in and out of the body to collect food and nutrients. Sea squirts have a thick outer coat made from a cellulose-like material. This is known as the tunic, which helps protect the animal from predators.

Photo: David Fairclough

Did you know?

Believe it or not, sea squirts are related to humans! In their larval stage, sea squirts have a basic backbone of rod cells (notochords), just like vertebrates, such as humans, fish and mammals. These cells are lost as the sea squirt develops into an adult.

Sea tulip

Sea tulip

Chordata – Ascidiacea

Sea tulips are named for their long stalks and rounded heads. Although considered a solitary (single) ascidian, a cluster of them can look like a bunch of tulips (flowers) attached to rocky reef or seagrass. Filtering the water for food and nutrients, these animals play an important role in our marine environment, removing particles as small as bacteria.

Photo: Clay Bryce

Did you know?

Ascidians have free-swimming larvae, which help them to disperse throughout the ocean. However, they do not feed during this time and must find a place to settle within a few hours, or they die.

Colonial ascidian

Colonial ascidian

Chordata – Ascidiacea

A colonial ascidian is a colony of animals (or zooids), where it is hard to distinguish separate animals – individual zooids can only be seen clearly with a microscope. They form intricate patterns and come in an assortment of colours. Ascidians are difficult to identify properly without examining the internal structure of the specimen.

Photo: Clay Bryce

Did you know?

Colonial ascidians usually grow as a coating on rocks or reefs, and can be mistaken for an encrusting sponge. The difference is that ascidians have a nervous system and they respond to touch by retracting and closing their siphons.

Sponge

Sponge
Porifera

Often mistaken for plants, sponges are commonly found by beachcombers because their skeletons are strong enough to survive the waves that wash them ashore. These sponges have lost their bright colours but generally retain the shape they had when alive. Sponges have no mouth, internal organs or nerves. Instead, their body is full of tiny holes, which help them to eat and breathe by filtering seawater.

Photo: David Fairclough

Did you know?

Spicules are microscopic structures that provide a support or skeleton for the animal. These hard spicules are made of either calcium carbonate (limestone) or glassy silica, and vary in size and shape.

Photo: Michelle Dyer

Bryozoan

Bryozoan

Bryozoa

Often mistaken for corals, sponges or algae, bryozoans (lace coral and sea mosses) are a colony of tiny animals called zooids. Each zooid is protected by a calcareous (limestone) horny case, which is left behind when the animals die. Colony members are independent of each other, feeding on plankton and other particles suspended in the water. However, when disturbed they will act as one, retracting into their protective case.

Photo: David Fairclough

Did you know?

Bryozoans reproduce by external fertilisation, releasing eggs and sperm into the water, which form free-swimming larvae. Larvae then attach themselves to a solid object and divide to create a new colony.

Photo: Michelle Dyer

Violet snail

Violet snail

Mollusca – Gastropoda

There are a few species of violet snails that may be washed up on Western Australian beaches by rough seas. A violet snail floats upside down far out in the open ocean, clinging to a raft it creates by secreting air-filled mucous bubbles that stick together and harden. Travelling at the mercy of ocean currents, these carnivorous snails feed on floating cnidarians, such as bluebottles and by-the-wind sailors.

Photo: Clay Bryce

Did you know?

Violet snails are adapted to life on the sea surface. When viewed from above, the dark purple colouration of the shell blends with the surrounding water and when viewed from below, the lighter colour blends with the sky. This type of camouflage is known as countershading.

Photo: Michelle Dyer

Turban snail

Turban snail
Mollusca – Gastropoda

Turban snails are found living in rock pools and on shallow reefs along the Western Australian coastline. As a protection from predators, the turban's body can be pulled inside the shell and its aperture closed by a shelly trap door called the operculum. After the turban's death, these trap doors may be found washed up onto the beach – in the tropics some very colourful ones are called cat's eyes.

Photo: Sam Bridgwood

Did you know?

You may notice scars on the outside surfaces of some turban shells. These are made by horse shoe limpets that attach themselves to the shell to feed on the turban's mucus and body wastes.

Photo: Sandy Clarke

Cone shell

Cone shell

Mollusca – Gastropoda

Cones live under rocks or coral boulders, and many species bury themselves in the sand with just their siphons extended like snorkels. The water sucked in through their siphon carries oxygen as well as the odour of prey, such as another mollusc, worm or a small fish. The cones can then rapidly harpoon their prey using a hollow, barbed tooth loaded with venom. Once the prey is paralysed it is usually swallowed whole.

Photo: Sam Bridgewood

Did you know?

Although not all cones are dangerous to humans, it is best to treat them with caution. Mollusc and worm-eating cones can inflict a painful sting but the venom of fish-eating cones can cause a human to suffer breathing difficulties, paralysis or even death!

Photo: Sandy Clarke

Baler shell

Baler shell

Mollusca – Gastropoda

Buried in the sand during the day, baler shells emerge at night to search for food. These large carnivorous (animal-eating) gastropods smother their prey with a large muscular foot and use their muscular rasping tongue (radula) and jaws to devour prey such as abalone.

Photo: David Fairclough

Did you know?

Baler shells were highly valued by Aborigines as storage and serving containers for food and water.

Limpet

Limpet
Mollusca – Gastropoda

Most limpet species have a cone-shaped shell and a muscular foot, with which they cling tightly to the reef or to other hard substrates. Grazing on algae at high tide, limpets generally return to exactly the same place where they left their mark on the rock at low-tide.

Did you know?

Look carefully on the rocks to see if you can see the scars or marks left behind by limpets that haven't yet returned after feeding.

Abalone

Abalone
Mollusca – Gastropoda

The ear-shaped shell of an abalone is hard and rough on the outside to protect the animal from predators, and smooth and shiny on the inside to protect the soft body from damage. Water is drawn in near the front of the shell, passes through the gills, and leaves through the row of respiratory holes near the edge of the shell. Abalone are herbivores – they feed on algae mainly at night and hold on tightly to the rocks during the day.

Photo: Anthony Hart

Did you know?

An abalone does not have a blood-clotting agent and can therefore bleed to death if it is damaged or injured when being removed from a reef.

Sea hare

Sea hare

Mollusca – Gastropoda

Sometimes dark slimy blobs wash up onto beaches during late summer and throughout autumn. These blobs are actually sea hares – a type of mollusc closely related to sea slugs or nudibranchs. Grazing on algae, their black, brown or purple colour (dark mottled green in some other species) acts as perfect camouflage as they slowly crawl over the seabed.

Sea hares only live for about a year – dying after laying their long tangled strings of eggs.

Photo: Gilbert Stokman

Did you know?

Be careful if handling sea hares – when threatened, these molluscs may excrete colourless toxic slime from the skin and a cloud of purple ink that can irritate the eyes. Some species can even kill a dog if eaten or even mouthed!

Photo: Sandy Clarke

Cowry shell

Cowry shell

Mollusca – Gastropoda

Popular with shell collectors due to their polished colourful shells, cowries generally live on sheltered inshore reefs. Young cowries have a fragile shell that is obviously spirally coiled. However, this shape is hidden as the last coil of the shell wraps around and hides the juvenile whorls. Cowries feed mostly at night, mainly on sponges. There are more than 60 species living along the Western Australian coast.

Photo: Ann Storrie

Did you know?

The shiny adult shell is due to a glassy layer that is secreted by the mantle flaps. These flaps slide up to cover the sides and top of the shell, only withdrawing when danger threatens. When the animal dies this shiny glaze is lost over time.

Periwinkle

Periwinkle
Mollusca – Gastropoda

Various species of periwinkles – dark blue, black, brown or grey – live on rocks in the splash zone above the high tide mark. They can survive for long periods out of the water due to the horny, tight-fitting trap door, or operculum, which retains the moisture within the shell. Periwinkles graze mainly on microscopic algae and diatom films on rock surfaces.

Photo: Michelle Dyer

Did you know?

Most periwinkles reproduce by releasing egg capsules into the water, which form planktonic larvae before settling on the reef.

Cuttlebone

Cuttlebone

Mollusca – Cephalopoda

Cuttlebones are the internal shells of cuttles (or cuttlefish). A cuttlebone largely consists of tiny gas-filled chambers that help the cuttle move up and down through the water column, particularly at night when they ascend to catch surface-dwelling fish. Like their relatives, squid and octopus, cuttles have a relatively short lifespan of 18 months to two years.

Photo: Shannon Conway

Did you know?

Some cuttlebones have teeth marks on them that may indicate what marine creature killed and ate the cuttle – a dolphin, sea lion, shark or large bony fish.

Photo: Sandy Clarke

Ram's horn shell

Ram's horn shell

Mollusca – Cephalopoda

The ram's horn shell is actually the spiral internal skeleton of a small squid-like animal, *Spirula spirula*, that lives in the deep open ocean. The shell, divided into small gas-filled chambers, helps the *Spirula* to move up to the ocean surface at night.

Photo: Sandy Clarke

Did you know?

When the animal dies, the shell floats to the surface and often becomes a raft on which other creatures, such as goose barnacles, attach themselves.

Chiton

Chiton

Mollusca – Polyplacophora

Chitons or polyplacophorans, are adapted for life on rocky surfaces in the wave-washed intertidal zone. They are oval in shape, having eight separate shell plates (resembling and functioning as armour) that overlap to protect the chiton's back. A tough, scaly tissue called the girdle surrounds this shell. Lacking eyes and tentacles, these vegetarians use their radula (rasping tongue) to scrape algae off rocks.

Photo: Michelle Dyer

Did you know?

Normally clinging tightly to rocks with its broad muscular foot, a chiton can roll up into a ball to protect itself if dislodged by a bird, crab or fish.

Photo: Sandy Clarke

Mussel

Mussel
Mollusca – Bivalvia

A mussel is a bivalve mollusc – it has a shell with two halves (valves) joined by a hinge. Of varied colours, mussels generally occur in groups, attached by tough flexible threads (the byssus or beard) to hard surfaces such as jetty pylons. With different species living in estuaries, oceans and coastal waters, mussels filter food particles from the water drawn in through their large gills.

Photo: Clay Bryce

Did you know?

Mussels can act as a substrate for other animals, such as barnacles, that attach themselves to their shell valves.

Photo: Sandy Clarke

Scallop

Scallop

Mollusca – Bivalvia

There are many types of scallops and some are very colourful. True scallops and saucer scallops spend most of their time on the ocean floor, but are strong swimmers. They swim by expelling jets of water – forceably closing their two shell valves and then opening them quickly to take in more water. Fan scallops are generally attached to hard surfaces or seagrasses by tough flexible threads called a byssus.

Photo: Clay Bryce

Did you know?

Scallops generally have many small eyes arranged around the edge of the mantle lobes that line the shell valves.

Pipi

Pipi
Mollusca – Bivalvia

Pipis or surf clams are small, wedge-shaped and sometimes colourful bivalves that live just below the sand surface in the surf zone of beaches. As the tide goes out, you may see them moving down the beach and burrowing back into the sand after being dislodged by waves.

Photo: Sandy Clarke

Did you know?

Sometimes you will find a pipi shell on the beach with a neatly drilled hole. This drill hole was made by the rasping tongue or radula of a predatory sea snail as it fed on the pipi's body.

Razor clam

Razor clam

Mollusca – Bivalvia

The shells of these large triangular bivalves have a razor-sharp edge that protrudes just above the shallow sand or seagrass beds, posing a hazard to bare feet. Razor clams anchor themselves in the sand by attaching their byssal threads (or beard) to buried stones. Their relatively fragile shells are then protected, and the clams are still able to draw in water for their oxygen and food requirements.

Photo: Clay Bryce

Did you know?

Razor clams (also known as razor fish, razor shells, pen shells and fan shells) are eaten in some parts of the world.

Sea jelly

Sea jelly

Cnidaria – Scyphozoa

Sometimes referred to as jellyfish, the sea jelly is not a fish at all as it lacks vertebrae. Sea jellies have a bowl or bell-shaped body, fringed with tentacles and oral arms. Largely at the mercy of the oceans currents, sea jellies drift in the oceans, feeding on plankton and small fish. There are many different kinds of sea jellies; some more common ones include the moon jelly and spotted jelly.

Photo: Ross Images

Did you know?

Sea jellies have specialised stinging cells called nematocysts that aid in defence and the capture of prey.

Photo: Cottesloe Coastcare

Bluebottle

Bluebottle
Cnidaria – Hydrozoa

The bluebottle is not a single animal but a colony of animals that depend on each other for survival. Some animals are specialised for feeding, digestion and reproduction, and one polyp (or animal) produces the gas-filled float. Drifting on the ocean currents, feeding on small fish and other animals, the main tentacle can range up to 10 m in length.

Photo: Clay Bryce

Did you know?

Warning – even a bluebottle washed up on the beach can inflict a nasty sting!

Photo: Sandy Clarke

Coral

Coral

Cnidaria – Anthozoa

Corals are colonies of tiny tubular animals called polyps and are generally classified as either hard or soft corals. The hard coral polyp secretes a cup-shaped limestone skeletal case that supports and protects the soft body of the coral polyp. When the polyp dies, the hard skeleton remains, and sometimes washes ashore. Coral polyps feed on small zooplankton, such as copepods and tiny marine larvae.

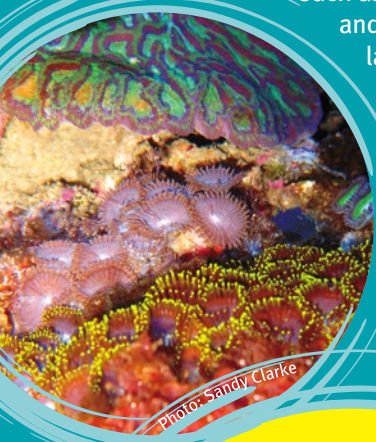

Photo: Sandy Clarke

Did you know?

Reef building coral polyps are in a symbiotic (mutually beneficial) partnership with zooxanthellae – tiny, single-celled algae contained in the cells of the polyps. The zooxanthellae provide nutrients for the coral polyps and in return the coral protects the algae.

Acorn barnacle

Acorn barnacle

Arthropoda – Cirripedia

Acorn barnacles have free-swimming larvae that attach themselves head-down onto hard surfaces, including rocks, jetties, boat hulls and even other marine animals and plants. As they grow, their external shell becomes a series of plates, and jointed legs develop into feathery appendages that trap plankton for food.

Photo: Clay Bryce

Did you know?

Barnacles are hermaphrodites – they have both male and female sexual organs. Barnacles can fertilise one another by using an extremely long penis or, if separated by long distances, they can fertilise themselves!

Photo: Michael Burgess

Goose barnacle

Goose barnacle

Arthropoda – Cirripedia

Goose barnacles are distinguished from acorn barnacles by having a tough but flexible stalk. As larvae they are able to drift and attach themselves to various objects, including ram's horn shells, cuttlebones and marine debris. Due to their mobile lifestyle, goose barnacles are found throughout Australian waters and some have a worldwide distribution.

Photo: Clay Bryce

Did you know?

The goose barnacle gets its name from a European legend, which states that barnacles drifting ashore attached to logs were the egg cases of geese. Geese migrated south each winter and did not appear to nest on land.

Crab

Crab

Arthropoda – Malacostraca

If you aren't lucky enough to see a crab alive, you may find part of their hard shell or exoskeleton (external skeleton) on the beach. The exoskeleton of crustaceans serves as a suit of armour and helps protect them from predators. The animal must periodically shed their exoskeleton to grow – a process known as moulting.

Photo: Michelle Dyer

Did you know?

Some crabs can spend long periods of time out of the water. They keep their gills moist in special gill chambers and extract oxygen from the air.

Photo: Sandy Clarke

Tube worm

Tube worm

Annelida – Polychaete

This twisted mass of calcium carbonate (limestone) found washed up on the beach was once home for a tube worm. The worm builds the limestone tube for protection against predators. If threatened or disturbed they will retract into the tube, closing their trap door or operculum behind them.

Photo: Sandy Clarke

Did you know?

When alive, a tube worm has elaborate tentacles to filter the water for oxygen and food, such as plankton and other organic matter.

Sea urchin

Sea urchin

Echinodermata – Echinoidea

Known as a sea egg, this hollow-shaped ball is actually the internal skeleton or test of a sea urchin. When alive, the test is covered with spines, which help the urchin to move around, as well as protect it from predators. The spines break off when the urchin dies and the empty tests wash up on the beach.

Photo: David Fairclough

Did you know?

Sea urchins are grazers, feeding on encrusting organisms such as sponges and algae. Their mouth is in the centre on the underside and contains a set of jaws and horny teeth, named Aristole's lantern.

Sea star

Sea star

Echinodermata – Asteroidea

Also known as starfish, these often brightly coloured echinoderms consist of five or more arms radiating out from a central disc. The mouth and tube feet are located on the underside of its body. Sea stars can be herbivorous (plant-eating), carnivorous (animal-eating) or omnivorous (plant- and animal-eating) feeders. The stomach is pushed outside their own body through the mouth to surround the food. Once the food is digested, the stomach is pulled back into the body of the sea star.

Photo: Sandy Clarke

Did you know?

Many echinoderms are able to regrow lost or damaged parts of their bodies, such as an arm. Some species can even grow back a complete new body from a single arm, if part of the central disc is attached.

The piles of algae and seagrasses found on the beach are known as sea wrack. The sea wrack is an assortment of seagrasses, algae, shells, and the remains of animals such as sponges and sea urchins. This detritus (dead and decaying material) provides a prime feeding place for swarms of amphipods, insects, larvae and other fauna. These tiny creatures play a large role in breaking down organic matter and recycling nutrients – and are an important food source for fish and birds.

Photo: Michelle Boyer

Sea wrack

Though widely considered as simple marine plants, seaweeds are actually plant-like organisms called algae. They do not have true stems, leaves, flowers or fruits, or roots, instead anchoring themselves to rocks by root-like holdfasts. They form the basis of the food chain in the marine environment, using energy from sunlight to make food. Although seaweeds are divided into three colour groups (green, brown and red), they are not always true to the group, as classification is based on their history and type of reproduction, rather than colour.

Photo: John Huisman

Algae (seaweed)

Green algae are characteristically green, although colour can range from yellowy-green to almost black. They exist as both large attached algae and free-floating microscopic (planktonic) algae, in both freshwater and marine environments. Marine attached green algae are commonly found on shallow rocky shorelines where the sunlight penetrates the water easily. It is thought that all terrestrial plants evolved from green algae, mainly due to the presence of chlorophylls a and b, which gives them the green colouration.

Photo: Michelle Dyer

Green algae

Phylum: Chlorophyta

Ulva, or sea lettuce as it is more commonly known, is named for its appearance and the fact that it is edible – it is used as a food source in many countries in salads, soups and other dishes. This alga grows in intertidal and subtidal waters, and is commonly found along rocky shores and groynes. *Ulva* uses its small holdfast to attach to a variety of substrates including reef, rubble, shells, nets and ropes. It is also seen washed ashore, as it is easily dislodged and can be torn during storms. Sea lettuce is an important food source for marine life, including abalone.

Photo: Michelle Dyer

Sea lettuce

Found throughout southern Australia, dead man's fingers is a large dark green alga with cylindrical branches that regularly branch into two. They can appear fuzzy underwater due to the presence of fine hairs but actually have a firm but spongy texture, which feels like velvet. Dead man's fingers belong to a group of algae referred to as *Codium*.

Photo: Michelle Dyer

Dead man's fingers

Velvet sponge weed also belongs to the group of green algae referred to as *Codium*. Like dead man's fingers, it has a firm but spongy texture that feels like velvet, hence the name. Velvet sponge weed however has an irregular shape which resembles a small mound, generally less than 10 cm high. This alga is widespread but it is primarily found in warmer seas. Another similar alga is the velvet golf ball.

Photo: Gilbert Stokman

Velvet sponge weed

Brown algae contain most of the large conspicuous algae seen on rocky shorelines and in shallow waters. Brown algae are the heaviest and largest seaweeds, and the fastest growing of all the algae. Almost wholly restricted to the marine environment, they are generally shades of brown, except for some that can appear blue underwater. Nearly all species of brown algae remain fastened on rocky or other firm habitats by a holdfast, although some species are free-floating.

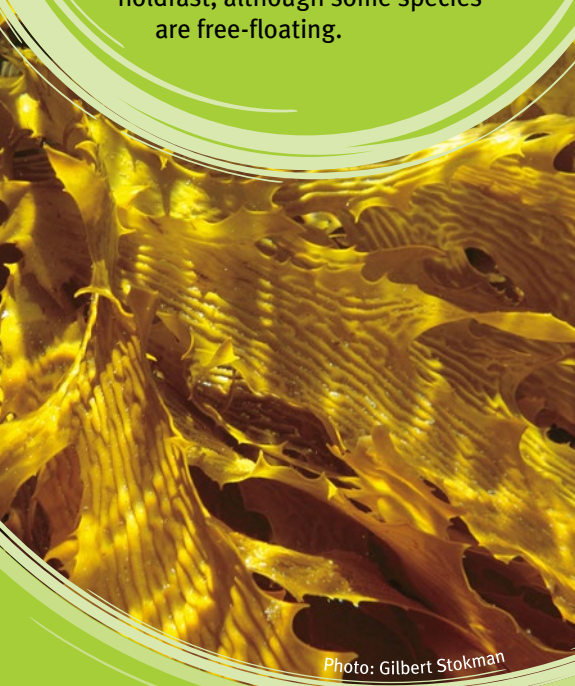

Photo: Gilbert Stokman

Brown algae

Phylum: Heterokontophyta
Class: Phaeophyceae

Kelp is a common brown alga that predominantly grows on limestone reefs and other hard surfaces. It can also form large beds that become home to numerous invertebrates and is an important food source for sea urchins, buffalo bream and other animals. Often washed ashore after rough seas, it also forms a large component of sea wrack. Kelp and other brown algae contain a gelatinous substance called algin that is widely used as a thickening or stabilising agent in products such as ice cream, salad dressing, pet food and toothpaste.

Photo: Michelle Dyer

Kelp

Found throughout Australian waters, *Sargassum* grows on subtidal reefs and in rock pools. *Sargassum* has a distinctive stem-like structure with leaf-like branches and can generally be identified by the small bubble-like floats. However, due to an annual growth cycle, reproduction and decay, they won't always have all these identifying features as they often die off around summer. *Sargassum* is a Spanish term for 'floating seaweed' – as the small bubble-like floats allow this seaweed to be suspended in the water column.

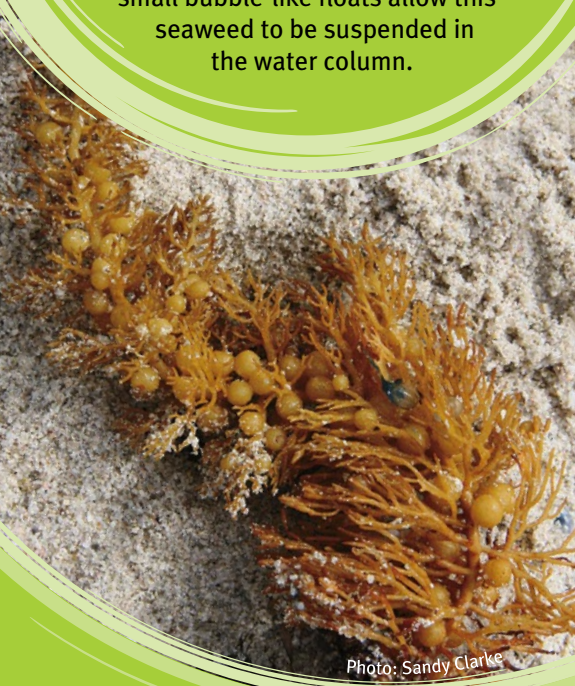

Photo: Sandy Clarke

Sargassum

Funnel weed or peacock's tail is found along the Western Australian coastline, usually in sheltered or semi-exposed locations, in intertidal rock pools and subtidal areas. The fan-shaped fronds create a funnel shape, giving this alga its name. As mature plants, the fronds often divide forming a cluster of branches growing to about 15 cm high. Funnel weed is the only brown alga in Australia that accumulates a thin chalky coating on one surface, known as calcification. This process is more common in green and red algae.

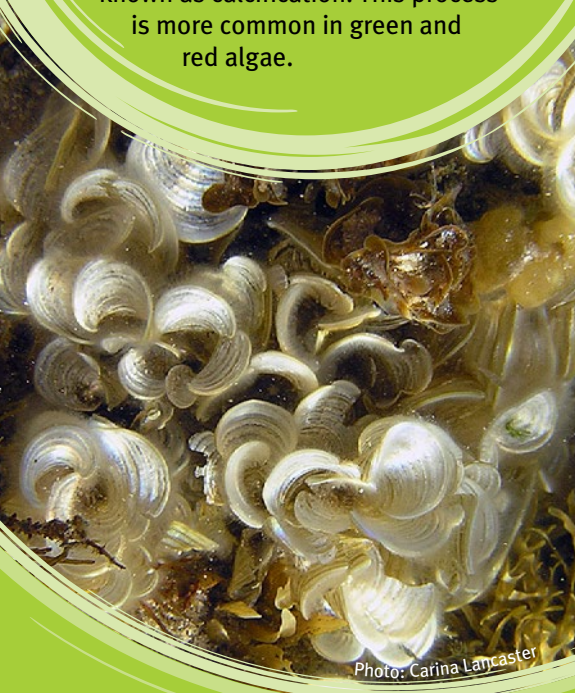

Photo: Carina Lancaster

Funnel weed

Red algae are the most numerous of the three seaweed groups but are relatively small and not easily seen, so are not noticed as often as green and brown algae. Red algae are generally the most abundant algae in deep water as they can tolerate lower light conditions than their relatives. Red algae come in a variety of forms and their texture may vary from fine and delicate to hard and crusty.

Photo: John Huisman

Red algae

Phylum: Rhodophyta

Found along southern Australia in subtidal areas to 20 m deep, slimy bags attaches to reef and rubble with a holdfast. Resembling a bunch of elongated balloons, they often grow in a cluster to about 15 cm high. The scientific name *Gloiosaccion* literally translates to 'glue sacks'. If you find one washed up on the beach, break it open and you will find a thick slimy substance – it is thought that this substance may deter herbivores (plant-eating animals).

Photo: Carina Gemignani

Slimy bags

Common on rocky reefs, this red alga is often washed ashore after storms. Similar to the Irish moss found in Britain, jelly weed was once collected by our colonial settlers, and then boiled. The liquid created was used to make jellies and blancmange (milk pudding). Carrageenan and agar can be found in their cell walls, which are thickening or stabilising agents. This means they dissolve in water and will set at room temperature.

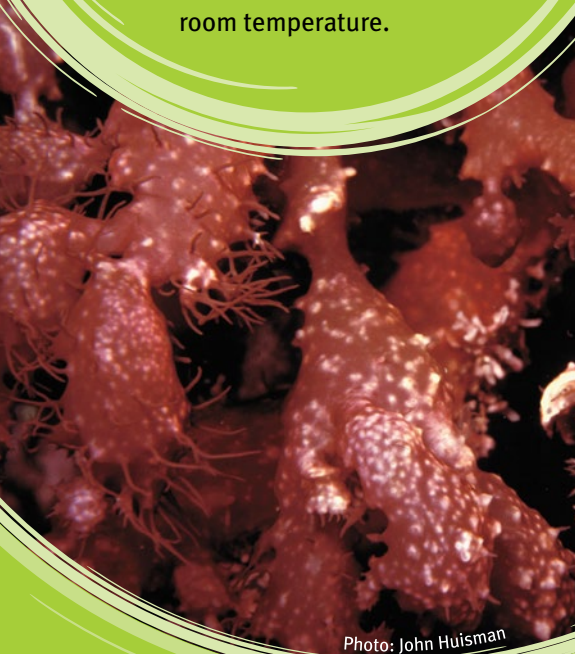

Photo: John Huisman

Jelly weed

Some species of algae live on other plants – these are known as epiphytes. Epiphytes are generally fast growing and can appear to dominate some ecosystems, particularly seagrass beds. However, they are a normal part of the environment and only become troublesome when excess nutrients cause them to bloom, at which stage they can damage the host plant by smothering it or competing for light.

Photo: John Huisman

Epiphytic algae

Seagrasses are marine flowering plants that can live underwater. Unlike algae, they are true flowering plants with leaves, roots, flowers, seeds and underground horizontal stems called rhizomes. They are highly specialised and have adapted to the soft sediments of coastal and estuarine environments. Seagrasses are extremely important as they stabilise sandy sea floors, provide habitat including nursery areas for juvenile fish and are an important food source for some marine mammals, including dugongs.

Photo: Michael Burgess

Seagrass

Phylum: Magnoliophyta

Found throughout most of Australia, paddleweed is easily recognised by its oval leaves (with obvious veins) and short stems. Growing in shallow sandy areas, this seagrass doesn't form large beds like strapweed or wireweed, but often grows in the gaps between them. Generally reaching no more than 5 cm high, paddleweed will often be the first to grow in patches created by storms or other disturbances.

Photo: John Huisman

Paddleweed

Strapweed or *Posidonia* is the only common seagrass in the Perth region, that appears 'grass-like'. Growing from rhizomes that spread just below the surface of the sand, strapweed creates dense and extensive seagrass meadows. Seeds float to the surface during spring before sinking to the ocean floor to germinate. Strapweed often sheds its leaves each year, which are often seen floating on the surface and washed up onto the beach.

Photo: Michael Burgess

Strapweed

The fibre ball comes from a seagrass called *Posidonia* or strapweed, which has ribbon-like leaves. The seagrass fibre balls are formed when the leaves break off in winter storms and get tossed around by waves and currents. This causes the fibre from the decaying leaves to tangle together. In the early 1900s, fibre from strapweed was collected for its high cellulose content and was used in the manufacture of suits, explosives and household products.

Photo: Sandy Clarke

Fibre ball

Along with strapweed, wireweed is one of the more dominant forms of seagrass in the Perth region. Found throughout southern Australia, wireweed forms extensive beds in shallow sandy areas. Its woody stalks provide homes to epiphytes and invertebrates, such as bryozoans. There are only two species of wireweed found in the Perth region, both of which are found only in Australia. The southern wireweed *(Amphibolis antarctica)* has relatively short leaves that are generally slightly twisted, whereas Griffith's wireweed *(A. griffithii)* has longer, straight leaves.

Photo: Carina Gemignani

Wireweed

The hooked base of a wireweed seedling is known as a comb anchor. When this seagrass reproduces, the seeds germinate and remain attached to the plant for up to 12 months, until they are the size of a small seedling with only a couple leaves. When the seedling is released, the hook at the base of the plant is used to attach itself to the sea floor – but sometimes they do not attach and are washed ashore.

Photo: Sandy Clarke

Comb anchor

This sausage jelly (as they are sometimes called) is actually the egg sac of a certain type of sand or moon snail. This snail generally buries itself in the sand, just below the surface, feeding on bivalves that also live in the sand.

Photo: Gilbert Stokman

Sausage jelly

This tough, dark brown spiral egg case is laid by the female Port Jackson shark. The female shark uses her mouth to wedge the egg case into a rock crevice, where it can stay for up to 12 months until the 24 cm pup (juvenile shark) emerges. Shark and skate egg cases are sometimes referred to as a mermaid's purse.

Photo: Michelle Dyer

Port Jackson shark egg case

The catshark is a nocturnal shark, rarely seen by divers. They lay their eggs on the ocean floor, using the coiled tendrils at the end of the egg case to attach it to fixed objects. The developing shark lives off the yolk sac but once born the shark must fend for itself. There are 21 species of catsharks found along Western Australia's coast, so it is hard to determine what species (or type) of catshark the egg case has come from.

Photo: Michelle Dyer

Catshark egg case

This series of dried up egg capsules were laid by the giant conch (*Syrinx aruanus*) – the largest gastropod species in the world. The first flat egg case (with enclosed eggs) is stuck to a rock or hard substrate by 'dobs' of mucous and subsequent egg cases are fastened on one side to the one below, so that the egg mass stands upright. When the eggs in each case hatch, they crawl out as tiny snails (about 2 cm long).

Photo: Michelle Dyer

Whelk egg case

The bobtail or bluetongue lizard is an omnivorous (plant- and animal-eating) skink, which likes to shelter under dead plants or rubbish and in burrows. Relying on the warmth of its surroundings to maintain body heat, it takes shelter at night and basks in the sun during the day. If you come across a bobtail lizard, don't be surprised if it hisses and opens its mouth displaying its blue tongue – it is just trying to frighten off a potential predator!

Photo: Michelle Dyer

Bobtail lizard

Most sea snakes live in warm water, however they may get caught in the Leeuwin Current and can occasionally be found washed ashore in the south-west of Western Australia. The yellow-bellied sea snake is the most common species found on beaches in the Perth area – it has a dark (black to brown) upper body and a yellow belly. Different to their terrestrial cousins, sea snakes have a paddle-like tail to assist with swimming. Treat with caution – these snakes are highly venomous!

Photo: Gilbert Stokman

Yellow bellied sea snake

Beaches provide an important haul-out (resting) area for seals and sea lions. In Perth you may be lucky enough to see Australian sea lions (which are only found in Australia) and visiting fur seals. For the health and safety of these animals, never feed them or get too close. If the animal seems injured or distressed, contact the Department of Environment and Conservation immediately.

Photo: Friends of Marmion Marine Park

Seals and sea lions

Following winter storms you may be lucky enough to help save a baby loggerhead turtle that has been washed ashore after travelling south in the Leeuwin Current. After leaving its beach nest, the sea turtle hatchling tries to avoid predators, such as birds, foxes, large fish and sharks. After making it this far, this endangered species now needs your help, so please place it in a bucket of seawater and immediately contact the Department of Environment and Conservation.

Photo: Babs & Bert Wells/DEC

Loggerhead turtle hatchling

While you are out beachcombing, keep an eye out for introduced marine pests. These are marine plants or animals that have been introduced to Western Australia's aquatic environment. They are a significant threat to biodiversity and are damaging to the economy, environment and lifestyles.

Once marine pests are well-established, they are virtually impossible to eradicate. To increase the chances of their successful removal, early detection is essential. Being aware of marine pests and reporting anything new and unusual is a great way to help.

You can help protect our precious oceans by reporting marine pests – contact the 24 hour **FishWatch** hotline on **1800 815 507**, or use the free **WA PestWatch app**.

For more information and how you can help recognise marine pests, visit **www.fish.wa.gov.au/biosecurity**

Watch out for marine pests!

These pests are not known to be introduced in the wild in Australia, but could be found on beaches if they did become established. Shells of both the Asian and New Zealand species are bright green to greenish-brown outside and pearly-white inside, with a bright green lip. These mussels have the potential to outcompete native species, clog water pipes and other man-made structures. Any green mussels found on the beach could be pests and should be reported!

Photo: Northern Territory Fisheries

Green mussels

Already introduced into Tasmania and Victoria, this pest seaweed could hitch a ride anywhere on boats. It has a strap-like midrib, with smooth thin 'leaves' that stop short of the base. Mature specimens are brown, with a frilly growth near the base. This pest grows quickly, growing all over mussels in farms and over underwater strutures in marinas. It can also out-compete native seaweeds. Wakame is edible, but best tasted in your local Japanese restaurant!

Photo: John A. Lewis

Japanese kelp (Wakame)

In Australia this pest seastar is already found in Tasmania and Victoria. It has the potential to carpet the sea floor in estuaries, bays and rock pools. It is yellowish/orange with purple markings on top and yellow underneath. Unlike some native species, this seastar has pointed, often upturned tips on its five arms. It is a hungry predator that eats many native marine species and affects commercial shellfish farms. It also breeds quickly, with females capable of producing up to 20 million eggs per year!

Photo: Justin McDonald

Northern Pacific seastar