

Sandy beaches comprise almost 50 per cent of Western Australia's coastline. With approximately 80 per cent of Australians living within 50 kilometres of the coastline, sandy beaches are under the most amount of pressure from coastal development and recreational uses.

The sandy beach environment is harsh and constantly changing, and inhabitants have to adapt to changes in salinity, temperature, water pressure, moisture, light, oxygen and food availability in order to survive. Sandy beaches also have ecological linkages with adjacent ecosystems including sand dunes and the surf zone, providing a constant interchange of sand, organic matter and nutrients.

At first glance, sandy beaches may seem like they are home to only the odd bird or crab, but in fact they are home to countless species of tiny animals that stay buried and hidden under the sand – protected from predators, the drying sun and buffered from extreme temperature changes and salinity.

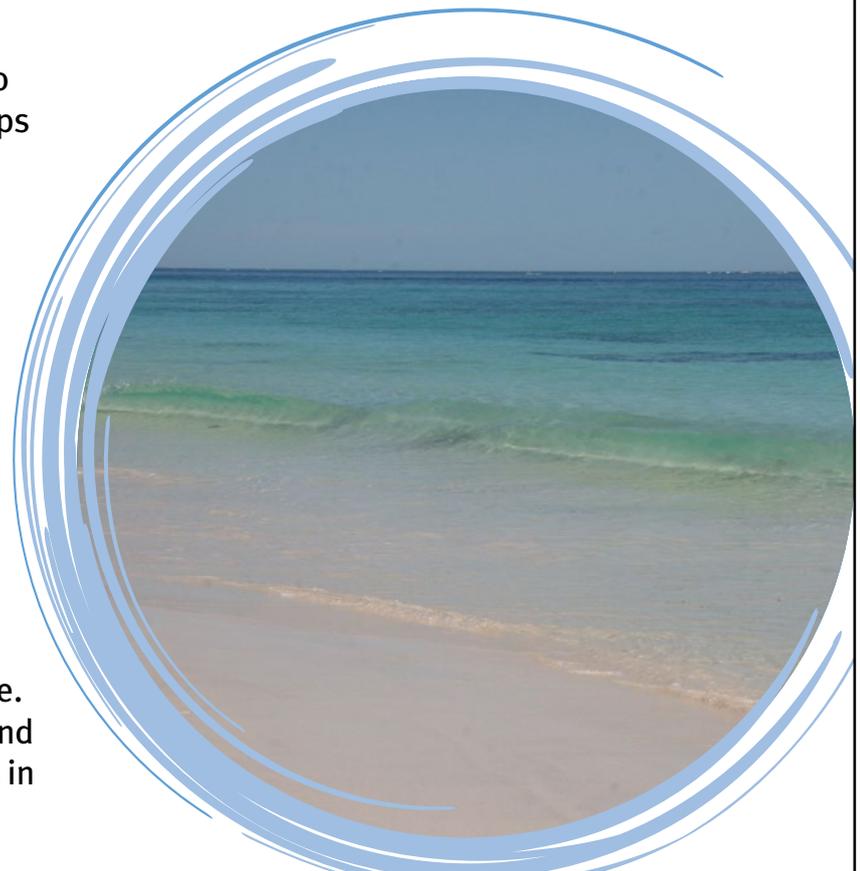
These invertebrates (animals that have no backbone) can be divided into three groups according to their size.

- **Macrofauna** are large enough to see without a magnifying glass or microscope. On sandy beaches, small crustaceans such as amphipods (sand hoppers) and isopods (sea lice and sea slaters), polychaete worms and molluscs dominate the macrofauna.
- **Microfauna** refers to microscopic animals that are small enough to live on the surface of a single grain of sand! As their name implies, they can only be seen through a microscope. Microfauna are incredibly numerous and there may be billions of these animals in just one gram of sediment.

- **Meiofauna** are sized somewhere between the other two groups. They are small enough to live in the spaces between the grains of sand, with the largest animals only just visible to the naked eye.

The diversity, abundance and distribution of these organisms are all related to beach profile, sediment type and moisture content. Diversity and abundance of invertebrate life generally increases closer to the water.

Sandy beaches may also have the presence of 'sea wrack' at certain times of the year, which plays an important part in the sandy beach ecosystem. Invertebrates, such as amphipods and isopods play a crucial role in recycling nutrients and transferring energy up the coastal food web.



Sea wrack

The coastline around Western Australia's south-west is home to extensive seagrass meadows, as well as fringing limestone reefs that support large beds of macroalgae, commonly known as seaweed.

Every year, enormous amounts of seagrasses and algae are torn loose by winter storms and heavy swells. The

plant material accumulates in the surf zone forming large mats or 'rafts', some of which are washed ashore and lie in banks on beaches and rocks along the high tide mark known as 'sea wrack'.

Sea rafts provide a food source for whiting, herring and yellow-eyed mullet. The sea rafts in the near-shore surf zone provide food and shelter for juvenile fish – an alternative to estuaries as nursery areas and are therefore important to our local inshore fisheries.

If you pick up a handful of sea wrack, you will see an accumulation of sea-grasses, algae, shells, and the remains of animals such as sponges and sea urchins. Even though much of the material is dead and no longer in the ocean, it forms an important part of the marine and coastal food web. The composition of sea wrack varies, depending on where you are on the coast. The washed-up material reflects plant species that are abundant offshore – algae and/or seagrasses.

The detritus (dead and decaying material) in the wrack provides a prime feeding place for swarms of amphipods, insects, larvae and other fauna. These tiny creatures play a large role in breaking down the organic matter and recycling nutrients, and are an important food source for fish and birds.

Winds and waves constantly shift this zone, so the creatures that rely on this moveable

feast are adapted to eating – and living – on the run.

The decomposition of sea wracks is vitally important. While the smell of rotting seaweed might be a nuisance to humans, it provides life to many species of invertebrates, birds and fish. Without sea wracks, the beach would be an inhospitable place for many animals, including shorebirds.

- Smelly sea wrack is an indication that bacteria are doing their work and the organic matter is breaking down.
- Dissolved nutrients are produced, which are important to the marine and shore environment, and seagrasses and algae, fish and other marine animals all depend on these nutrients.
- Rafts of plant material floating in the surf zone form an important nursery area for many species of juvenile fish, as they provide shelter from predators and an abundant food source.

Did you know?

Beach foam is formed when dissolved organic material (such as plankton and algae) are whipped up by strong winds and waves on the beach, to create tiny air bubbles.



Sandy coast food web

