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# Shark Bay World Heritage Notes



ENVIRONMENT AND CONSERVATION DISTRICT OFFICE, DENHAM, WESTERN AUSTRALIA

## SEAGRASSES OF SHARK BAY

Shark Bay has the largest area of seagrass and largest number of species ever recorded in one place in the world. In Shark Bay, there are 12 species, and in some places, nine can easily be identified in a square metre. The most abundant is wireweed (*Amphibolis antarctica*), covering nearly 3 700 sq km of the Bay's sandy bottom.

Shark Bay covers about 13 000 sq km, of which 4 000 sq km are seagrasses, with the Wooramel Bank on the eastern side of the Bay covering 1 030 sq km and stretching along the coast for 129 km – making it the world's largest seagrass meadow.

Unlike other tropical and subtropical areas in the world, which have small seagrasses, Shark Bay has lush, long grasses that cover nearly a third of the shallow Bay. This dense growth is not only a major source of photosynthetic production, but also provides a home and food for a rich diversity of marine fauna. Here, zones overlap. Tropical species meet temperate species from the colder southern waters. Shark Bay provides the ideal breeding pool with its high light intensity, protection from large oceanic movements and lack of fresh water run-off.

The clear waters of the Bay allow sunlight to penetrate underwater and photosynthesis – essential for the growth of plants – to occur. The low rainfall in the area, and the subsequent low run off of muddy waters into the Bay, helps to maintain water clarity. Islands, such as Dorré and Dirk Hartog, and offshore limestone reefs, shelter the seagrass meadows from the storm driven swells that might tear them from the sandy bottom.

Seagrass differs from seaweed. Seaweeds are simple plants that have no roots or flowers and need a firm surface like a rock, to grow on. Seagrasses, in contrast are green, flowering plants with a complex root system and an unusual reproductive process. Unlike seagrasses, few species of flowering plants can survive in a salty, underwater environment. Shark Bay's seagrasses provide a platform on which small seaweeds and animals can attach and grown as epiphytes.

These seaweeds and animals are an important part of the Bay's food chain, being grazed on by fish and smaller crustaceans. The seagrass meadows are a nursery for small fish and prawns and dugongs and turtles feed on seagrass.

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The tidal movement within the Bay circulates oxygen, which is vital to the growth of seagrasses and the male seagrass pollen. Apart from its importance in the food chain, seagrasses play an important role in the well being of Shark Bay's environment. Seagrass meadows can slow water movement, like stopping a one knot current and smoothing a one metre wave. This is important for organisms living in shallow tidal and fish nursery areas.

Seagrass meadows also prevent sand erosion and trap sand to form banks suitable for seagrass to grow, and also organisms such as burrowing bivalve mussels to grow. Shark Bay produces seagrass equivalent to four to six wheat crops a year from a similar area, an estimated eight million tonnes – more than enough to feed Shark Bay's resident population of between 10 000 – 14 000 dugongs.

Not only does the seagrass trap sediment, it also helps to form new material. Wireweed produces its new leaves in the centre of each leaf cluster and sheds the old leaves from the base. The old leaves fall off the plant and most remain within the meadow. The organic matter of the leaves breaks down and the calcium carbonate of the algae becomes incorporated into the sediments of the Bay. New leaves are produced continuously by the seagrass, and so form a 'conveyor belt' for the production of new sediment.

Over the past 5 000 years, the combined processes of producing calcium carbonate and trapping sediments, have resulted in large banks being formed, such as the Fauré Sill. These banks may be up to 10 metres thick, thus accumulating faster than many coral reefs.

Massive areas of seagrass have been lost from the Perth and Albany areas, as seagrass is very sensitive to the build-up of nutrients resulting from sewage outfalls, and industrial and agricultural wastes.

Once the larger seagrasses have gone, they don't come back. We need to look after seagrasses where they are – particularly in an environment like Shark Bay, where the whole marine system depends upon them.