

Poster: The Secrets of Seagrass

WA Curriculum

K-10 Humanities and Social Sciences, K-10 Science

Region

North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

Summary

Not your normal grass. Seagrasses are a marine flowering plant that can live underwater.

The SECRETS of SEAGRASS

Seagrass beds can be up to 50 cm in depth.

Seagrasses are a marine flowering plant that can live underwater. Unlike algae, they are true flowering plants with leaves, roots, flowers, seeds and underground horizontal stems called "rhizomes". Seagrasses are highly specialised and have adapted to the soft sediments of coastal and estuarine environments. Seagrasses can range from the size of a fingernail to plants with leaves 7 m long. Many individual plants live together to form extensive seagrass "beds" or "meadows".

Algae are very different to seagrass. They have "rhizoids" - like roots - but they do not have stems, and reproduce by spores rather than flowers and seeds.

Natural beds of red-tipped grasses from Posidonia seagrasses are often washed up on beaches, as the leaves are torn off in waves currents they are rolled together and become tangled together by the waves and currents.

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Western Australia: Home of lush marine pastures

Worldwide, around 60 species of seagrasses exist and Australia is home to over 30 species covering an estimated area of 51,000 km².

Western Australia can claim the largest and most diverse seagrass meadows in the world with an unvalued 27 species and an estimated area covering 20,000 km² - more than the area occupied by rainforest in the whole of Australia. Western Australia's dry climate and nutrient-poor but clear waters allow seagrasses to thrive.

Wooramel Bank, Shark Bay World Heritage Area
Of Shark Bay's 13,000 km², about 4,500 km² are covered by seagrasses. Over a quarter of that area is the Wooramel seagrass bank - the largest structure of its type in the world. The bank has taken about 5,000 years to develop. It is no wonder that Shark Bay has the largest breeding populations of dugongs in the world.

Seagrasses in the southwest
Seagrass meadows off the coast of the southwest of the state have the largest biomass (mass of living organisms) and the highest species diversity anywhere in the world, with 27 species of seagrass recognised in this region. Shark Bay contains 12 species of seagrass and the extensive seagrass meadows around Rottnest Island boast rare species.

Seagrass meadows produce an additional 6 million tonnes of food each year. The world needs 4 billion tonnes of food each year. That's a small amount of food to produce a small quantity of food.

Some seagrass meadows are so shallow they can be seen from a speed-boat while sailing past.

Threats to seagrasses

Let's get serious! Seagrasses are under threat from human impacts and in Western Australia we have already experienced large seagrass losses in Cockburn Sound near Rockingham, and Oyster Harbour and Princess Royal Harbour in Albany. If damaged or removed, seagrass beds take many years to recover.

Threats to seagrasses include:

- Eutrophication.** Excess nutrients cause either microalgae blooms or excessive growth of epiphytes on the leaves of seagrasses, which reduces the amount of light received for photosynthesis.
- Turbidity and sedimentation.** If not properly managed, factors such as agriculture and vegetation clearing in catchment areas, coastal and marina development and dredging can cause sand and silt to enter seagrass meadows. Increased turbidity or cloudiness of the water reduces light penetration affecting photosynthesis while a built up of sediments will bury seagrasses.
- Water pollution.** Stormwater run-off, oil spills, herbicides and pesticides, discharge and other wastes can pull large areas of seagrasses at risk.
- Boating impacts.** Damage to seagrass meadows by boat propellers, anchors, anchor chains and moorings is also common. The anchor from a large vessel can destroy an area of seagrass the size of a football field.
- Natural causes.** Storms or cyclones large enough to tear up and smother seagrass meadows can occasionally arise.

In the early 1980s, about 100,000 seagrass meadows were lost to the manufacture of salt, explosives and insecticide products.

The importance of seagrass

Seagrasses trap and recycle nutrients. Animals such as dugongs and sea turtles feed directly on the plants themselves. Many other creatures, such as bacteria, worms and crabs, feed on the decomposing leaf litter (known as "detritus") that releases nutrients when it decomposes or breaks down.

As well as directly producing organic matter, seagrasses play host to a range of small organisms called "epiphytes" (which are plants) and "epifauna" (animals) that live and feed on seagrasses. Juvenile fish, prawns and other marine creatures feed in turn upon the smaller organisms, creating a complex food web.

Seagrass meadows provide shelter for marine animals: they offer protection from predators and provide breeding habitats and nursery areas for a number of fish and crustaceans, including whiting, tailor, flathead, prawns and crabs.

Seagrasses are important stabilisers, trapping sand and sediments by slowing water movement. The "banks" of seagrass provide a protective buffer, preventing erosion of beaches and shores from waves and currents and helping to keep the water clear.

The reduction in water movement is also important for organisms, particularly juveniles, living in shallow areas that would otherwise be buffeted by waves.

Seagrasses oxygenate the water through photosynthesis. One square metre of seagrass can generate up to 10 litres of oxygen per day.

Creature Feature

Western rock lobster forage in seagrass meadows close to the reefs in which they shelter.

Blue swimmer crabs forage on organisms living in and amongst seagrasses in coastal waters and estuaries.

Juvenile King George whiting use seagrass beds as nursery areas before moving to offshore reefs to begin their adult life.

Dugongs can consume up to 40 kg of seagrass per day.

Many species of juvenile prawns are highly dependent on seagrasses for food and shelter.

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