

Seagrasses

What are seagrasses?

Seagrasses are plants that grow underwater – but they are not the same as seaweeds (algae). Some species of seagrass look very much like terrestrial (land) grass, with straplike leaves or paired oval leaves.

Places where many seagrass plants grow together are often called seagrass meadows or seagrass beds.



Seagrasses are commonly found in shallow coastal marine locations, salt-marshes and estuaries; in the tropics they are often found associated with mangroves.

Like any plant, seagrasses need light to grow and are usually restricted to the upper two metres of water where there is sufficient light.

Seagrasses often grow on soft sand or mud. To anchor themselves firmly to the bottom seagrasses have an extensive root system. This stops the plants from being washed away in stormy seas.



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Why seagrass isn't seaweed!

Both seagrasses and algae (seaweeds) grow in the sea, but seagrasses are different from algae in several ways.

- Seagrasses produce flowers, fruit and seeds — algae produce different kind of “seeds” called spores.
- Seagrasses, like terrestrial grasses, have separate roots, leaves and underground stems called rhizomes. In contrast, algae rarely have ‘roots’ below the surface.



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How does seagrass grow?

To grow, seagrasses need nutrients, often obtained from nearby mangroves, and good light, which means clear water.



Seagrass beds from the air

Seagrasses cannot grow easily where they dry out at low tide. They therefore thrive in shallow coastal waters where there is shelter from waves and strong currents.

Sensitivity to water clarity (clearness) means seagrass beds can die if large amounts of soil wash onto them from the land.



Seagrass beds at low tide

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Although the leaves of the seagrass grow fast, the rhizome grows relatively slowly. As a result, once seagrass beds are damaged, their recolonisation is very slow.

Why is seagrass important?

Seagrasses are an essential part of the marine environment and are central to a web of life.

They stabilise sand and mud banks (keeping water clear) and form the basis of a complex ecosystem supporting forms of life from dugong to plankton.

Seagrass ecosystems provide habitats for a wide variety of marine organisms, both plant and animal; these include bacteria, plankton, fish, turtles, and dugongs.

1. Seagrass is a food source

Seagrasses grow fast, producing a great amount of organic material. A single hectare of seagrass meadow may produce up to 20 tonnes of leaf material each year.

Those animals that eat live seagrass depend on it for their survival. Dugong, sea turtles, sea urchins and some fish, crustaceans and birds eat seagrass as a major part of their diets.



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Dead seagrasses are an even more popular item on the menu, and form the basis of lengthy **food chains**. Dead seagrass re-enters the food web in two ways,

1. The *detritus* produced by bacteria breaking down dead seagrass plants provides food for worms, sea cucumbers, crabs and filter feeders such as anemones and ascidians.

2. Further breakdown releases *nutrients* (nitrogen, phosphorus) into the water where they are re-used by seagrasses and plankton.

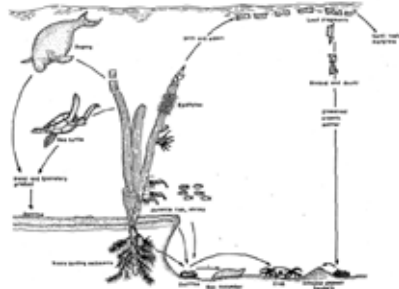
The following steps explain these processes in more detail.

Detrital food chain

1. Water turbulence and repeated ingestion by leaf-eating animals mechanically breaks up the old, dead, decaying leaves.
2. Bacteria and fungi decompose the broken-down seagrass material into detritus.
3. Invertebrates such as crustaceans, molluscs and worms feed on the detritus.
4. In turn, fish and birds eat the invertebrates.

Nutrient-cycling

1. Organic matter (nutrients) leaches into the water during the process of leaf breakup.
2. Bacteria and seagrasses grow using these nutrients.
3. Small invertebrates in the water (plankton) feed on the bacteria.
4. Larger invertebrates living in the seagrass feed upon the smaller invertebrates (e.g. juvenile shrimps eat plankton).
5. In turn, the large invertebrates are eaten by fish and birds.



2. Seagrass provides homes and shelter

As well as directly producing organic matter, seagrasses act as a substrate (base) for many epiphytic organisms (organisms that grow on other organisms).

Seagrass leaves support an array of attached seaweeds and tiny filter-feeding animals like bryozoans, sponges, and hydroids as well as the eggs of ascidians and molluscs. These plants and animals provide food for small fish that live in the seagrass.

Many marine animals hide from predators among the waving leaves of seagrass. Small fish and crabs can hide away from big hungry fish!



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3. Seagrass contributes to the physical structure of the environment

Seagrass plants stabilise sand and mud banks, keeping the water clear. The leaves and upright stems of seagrasses slow down water currents. Their dense root system holds the sediment (soil) together and reduces erosion.

4. Seagrass has economic value

Seagrass beds are believed to rival rice paddies in their photosynthetic productivity (the amount of the sun's energy they convert to plant sugars) and are very important as nurseries and habitat for many commercially important species of fish and prawns.

Seagrass beds are also home to fish that humans don't like to eat. However, it is important to care for all organisms that live in seagrass habitats because as they are part of the food web that produces the fish we find tasty!



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However, the value of seagrass meadows cannot simply be calculated in dollars. They are an essential part of the marine environment.

Dead seagrass



Dead dugongs

In mid-1992, fishers in Hervey Bay, Australia, began to report large numbers of **dead dugongs** in the area. Scientists set out to check on the seagrass beds. Four years earlier there had been lots of this dugong food, but now scientists found almost none remained!

How had this happened?

1. The nearby river had flooded twice, carrying lots of soil into the sea. Probably from places where humans had chopped down many trees and plants to grow crops or build houses.

2. Then a cyclone had stirred up the soil and sediment. This made the water cloudy for a long time and probably killed the seagrasses by blocking their sunlight.

3. Without their seagrass food the dugongs had starved or moved away.

4. Sadly, the death of the seagrass probably also led to the deaths of many smaller animals like sea urchins and fish.

Threats to seagrass

Now that the value of seagrass habitats has been recognised, care is needed to ensure their survival. As humans have encroached on the marine environment, there have been some dramatic effects on coastal ecosystems. Many human activities threaten or destroy seagrass habitats.

Land reclamation: Shallow areas occupied by seagrasses, mangroves, and saltmarshes, are often seen as ideal sites for waterfront developments. Their reclamation, by the dumping of extra soils and rocks, totally destroys valuable fish habitat.

Dredging: The removal of sediment from the sea floor may destroy seagrass beds. Dredging can also release large amounts of sediment into the water, which may smother seagrass beds.

The resulting murkiness of the water also blocks sunlight and inhibits the growth of seagrasses.

Trawl fishing: Repeated trawling and outboard motors may damage sea grass beds.

Pollution: Discharge of waste into the water from sewage outfalls, factories, abattoirs, or from general agricultural run-off, may cause too much algae to grow in the water or on the seagrass plants. Both these

things reduce the amount of sunlight that can get to the seagrass plants and they may die.

Poor land management: The clearing of land vegetation in steep areas, particularly of trees along river banks, often leads to erosion and the washing of sediment (soil) into waterways. This sediment can smother seagrass beds or make the water cloudy so they don't get enough sunlight. Too much freshwater flowing onto seagrass beds can also damage them.

Overexploitation: Seagrasses are used extensively in central Vietnam to produce fertilizer for crops and animal food. Seagrass is also used to make craft items such as baskets and mats. There is a danger that people will use up too much seagrass.

Recreation: People boating around seagrass beds should be careful not to damage them. Moorings with their chains dragging across the bottom, boat anchors and propellers, and bait digging all damage seagrass beds.

Structural flood mitigation works: When a barrier, such as a weir or floodgate, is built across a tidal water flow, the upstream habitat changes from brackish (slightly salty) to freshwater. This means that fish habitats such as mangroves and seagrasses above the barrier die because they need some salt in the water to survive.

How to protect seagrass

1. Respect drains & don't litter. Remember that stormwater drains flow straight to waterways. Don't throw rubbish in the street or gutter because it might end up in the ocean.

3. Tell your friends and family about seagrass and how to protect it. Encourage them to do the right thing and reduce water pollution.

3. Protect seagrass. Be careful not to damage or destroy seagrass through careless boat anchoring. Support establishment of marine parks that protect seagrass habitat.

Text and information sources

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