Information sheets For fishing communities

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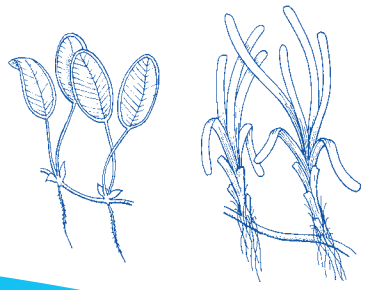
Seagrasses



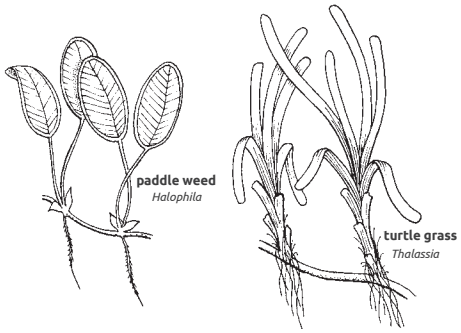
What are seagrasses?

Seagrasses are relatives of flowering land plants that moved to the sea between 50 and 100 million years ago. The only plants in the sea before this were the seaweeds (marine algae).

Seagrasses are not true grasses but they have a similar structure. They have leaves attached to a short upright stem and creeping horizontal stems or rhizomes. Seagrasses obtain nutrients mostly through root systems like their land-based relatives, rather than from the water like seaweeds.

The leaf blades are long and grass-like in most species but are shaped like broad paddles in the species shown at the left of the illustration below.

The western Pacific Ocean has 13 of the 60 or so species of seagrasses in the world. Because seagrasses require strong sunlight they grow in shallow water — commonly just below low tide on reef flats and sandy lagoons and between tides on muddy banks.



How do seagrasses reproduce and spread?

Seagrasses have small flowers that are fertilised by pollen, not carried by insects, birds or wind as in land plants, but carried by currents in the sea. In addition, seagrass pieces can break off to drift and grow in other suitable places. Seagrasses can spread rapidly by means of their network of horizontal stems that send up shoots to form vast beds resembling underwater fields or meadows.

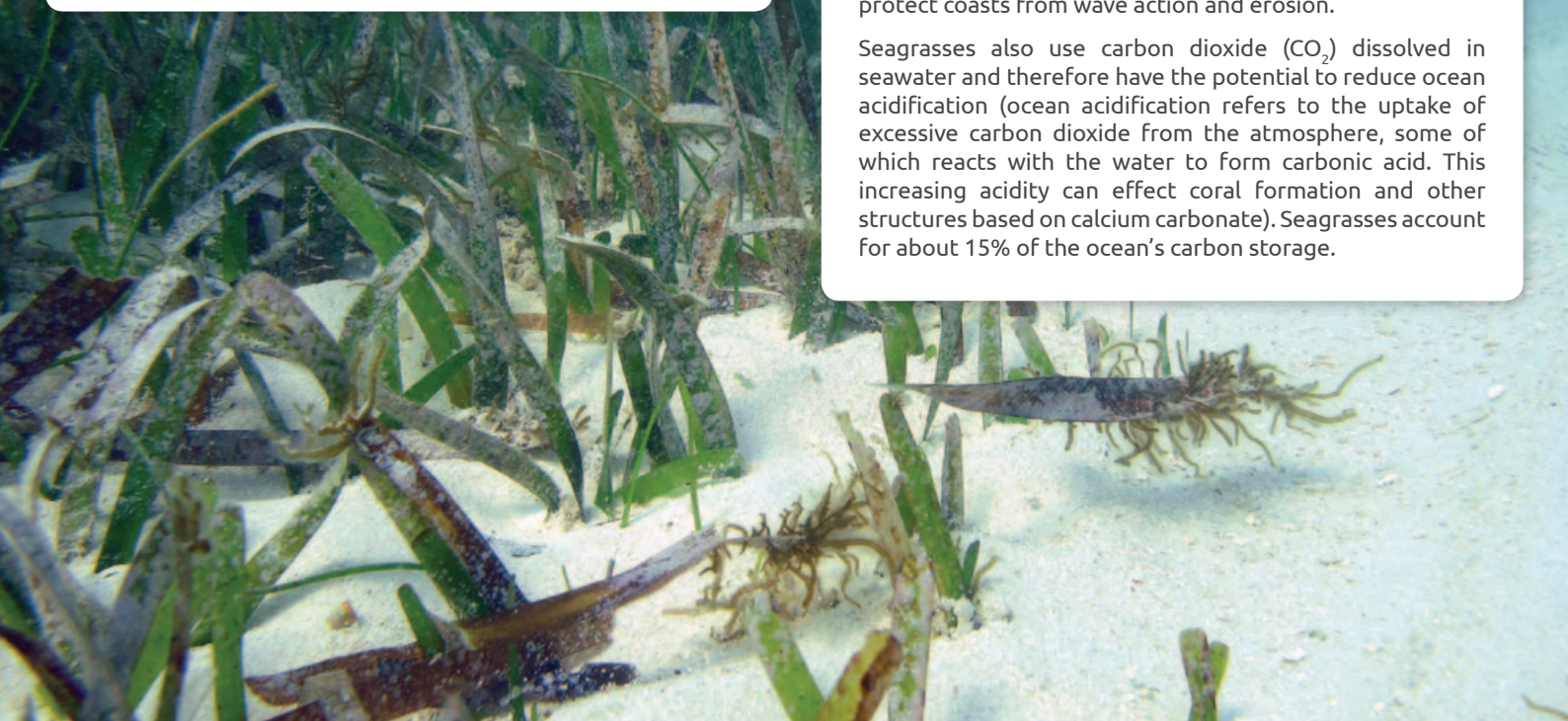
Why are seagrasses important?

Seagrasses provide food and shelter for many marine animals. Green turtles, dugongs, some fish and sea urchins eat seagrasses. And many more species graze on the fine hair-like seaweeds (epiphytes) that grow on seagrass leaves. The leaves eventually rot away to form detritus — particles of material that provide food for a much wider range of marine species.

Seagrasses absorb nutrients through their roots and therefore recycle material that would otherwise be trapped in the substrate. Besides being highly productive areas, seagrass beds provide sheltered nursery areas in which the juveniles of many marine species live and grow before moving elsewhere as adults.

Beds of seagrass trap sediments that would otherwise smother corals. And in doing so, they extend shorelines and protect coasts from wave action and erosion.

Seagrasses also use carbon dioxide (CO_2) dissolved in seawater and therefore have the potential to reduce ocean acidification (ocean acidification refers to the uptake of excessive carbon dioxide from the atmosphere, some of which reacts with the water to form carbonic acid. This increasing acidity can effect coral formation and other structures based on calcium carbonate). Seagrasses account for about 15% of the ocean's carbon storage.



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Seagrasses

Why are seagrasses disappearing?

Almost 30% of seagrass beds around the world have been lost since records began. Reduced water clarity from coastal development and the runoff of nutrients from houses and farms, as well as land reclamation, have caused the loss of seagrass beds in many Pacific Islands.

Coastal construction and port development produces silt that reduces light penetration and sometimes smothers seagrass beds. In some cases, the removal of mangroves has allowed silt to affect nearby seagrass beds.

Nutrients from sewage and fertilisers cause very small floating plants (phytoplankton) to increase in numbers and reduce the amount of sunlight reaching the seagrasses. In addition, nutrients result in seagrass leaves becoming overgrown with mats of small seaweeds which also block sunlight.

Climate change is also likely to affect the distribution of seagrasses. Rising seas may provide more shallow water areas in which seagrasses can spread.

In the Caribbean, entire seagrass beds have been lost due to the overgrazing of seagrasses by population explosions of species such as sea urchins. The sea urchins increased in numbers because their predators, trigger fish, were removed by overfishing.

How can we manage and protect seagrasses?

To protect seagrass beds, action is required on a national scale to manage coastal zones. However, some of the following actions could be undertaken by coastal communities.

→ Monitor water quality and the extent of seagrass beds

Government environmental authorities should monitor water quality at key locations around the coast, particularly to detect high silt and nutrient loads. Baseline maps of seagrass beds, completed with the aid of coastal communities, will allow the detection of any changes in their distribution.

→ Raise awareness of the importance of, and threats to, seagrasses

In spite of the importance of seagrass beds in providing fish habitats and in protecting coasts, they receive less publicity than mangroves or coral reefs. Public education programmes should stress their importance and identify actions that communities can take to protect them.

→ Reduce nutrients and other pollutants entering coastal waters

Sediments and nutrients running off the land into coastal waters can be reduced by planting shrubs and trees on riverbanks and by maintaining mangroves on shorelines.

Sustainable agricultural practices should be directed at minimising erosion and the runoff of fertilisers and animal waste. Farm animals must be kept away from places where their waste can enter rivers that flow to the sea.

→ Control coastal development

The government should require an environmental impact assessment for all new development to ensure that disruption to coastal areas is minimised. Zones of shrubs, trees and coastal vegetation, especially mangroves, should be left and maintained around rivers and on coasts.

→ Protect seagrass areas

Many species of fish use seagrass beds for shelter and food when they are small and move out to the reefs as adults. Several commercially important species, such as sea cucumbers, rely on seagrass beds as juveniles. Therefore including both seagrass areas and coral reefs in the design of marine protected area networks will allow many species to complete their life cycles.

→ Restrict fishing on species that control the numbers of seagrass grazers

As a precautionary measure, protect species such as triggerfish that keep seagrass grazers such as sea urchins under control.

→ Restore seagrass beds

Seagrass beds can be restored by transplanting mature plants from healthy donor beds in the same way that mangrove areas are restored. However, this is usually very expensive and has had limited success in other places; advice should be sought from local and regional authorities.

The first priority must be to improve environmental conditions, particularly water quality. If conditions are improved, natural regeneration may make transplanting unnecessary.

This information sheet has been produced by SPC (**www.spc.int**) in collaboration with the LMMA Network (**www.lmmanetwork.org**) to assist people working with fishing communities in providing advice on appropriate fisheries management options. Please refer to guide book for an explanation of terms used in this information sheet. Photos: Nashworld and Rian Tan (www.wildsingapore.com).

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