

The BEAT

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Gardens' beneath the waves

SEA-GRASSES are among the most productive ecosystems in the world. You may not think that plants can live under the sea but sea-grasses are bona fide aquatic plants and can even flower under the water. Sea-grass communities (meadows) provide nursery habitats for a variety of fish and shellfish and also provide food for plant grazers. One of the more common seagrasses found in our near-shore waters is actually referred to as "turtle grass".

There are three main species of sea-grasses in Trinidad and a fourth species in Tobago. These species are: *Thalassia testudinum* (the aforementioned turtle grass), *Halodule wrightii* (shoal grass), *Halophila decipiens* and *Syringodium filiforme* (manatee grass).

Usually found close to shore, and often associated with mangrove-lined coasts, these meadows may gradually lend themselves to a zone of coral reefs in some areas, such as our very own Buccoo Reef.

Sea-grasses are found on the west coast of Trinidad, from the

sheltered waters of William's Bay in Chaguaramas, alongside the kayak centre and extending down to St Peter's Bay and near to the Point Cumana River. Smaller communities can be found near the Trinidad and Tobago Yacht Club and near Pointe-a-Pierre Yacht Club. Recent explorations have revealed sea-grass beds in the North Claxton Bay area.

William's Bay consists of mixed species of sea-grasses, but is dominated by *Thalassia testudinum*; while beds in Pointe-a-Pierre and North Claxton Bay are dominated by *Halophila decipiens*.

Along the east coast of Trinidad, within the Salybia area, sea-grass beds are associated with the reef. The north-east section of Guayaguayare Bay also consists of sea-grass beds in association with a reef ecosystem.

In

Tobago, mixed communities of all four sea-grass species are found in King's Bay and Canoe Bay. Bon Accord Lagoon has a well-developed sea-grass community which is part of the Bon Accord-Buccoo Reef Complex. Sea-grass beds are also found in La Guira Bay, near Kilgwyn, and in Petit Trou Bay.

Many natural and man-made influences have threatened sea-grass communities over the years. Did you know that Scotland Bay once had a reef-sea-grass complex? Sea-grasses also once existed in Grand Fond Bay of Monos Island, as well as around the Five Islands, Cocorite (near the

mouth of the Diego Martin River) and at Speyside, Tobago.

Some of these threats include: dredging and indiscriminate dumping of dredged "spoil" onto sea-grass beds; sand mining and land reclamation for coastal development; coastal erosion and deposition; indiscriminate hillside development, leading to erosion and flooding; nutrient enrichment from agricultural lands, sewage runoff; thermal out falls from industries; oil pollution; boat anchoring; trawling; and, finally, natural changes in coastal dynamics with regard to seasonal current and wind patterns.

Sea-grasses need sunlight like other plants, so they can only survive in water where the sunlight is able to penetrate. If there is a sediment overload, then the plants will not be able to get sunlight in the turbid water and they may die.

Damage to the roots or rhizomes by

boats, paddles or engines, may also cause these plants to die.

Nutrient enrichment by sewage and agricultural runoff increases the organic particulate matter in the water and leads to excess nutrients in the water that leads to plant growth.

Thermal pollution from industries implies that very high-temperature water exists at the point source of the pollutant. *Thalassia testudinum* (turtle grass) can only exist in water temperatures ranging from ten-42 degrees Celsius. Water temperatures of 46 degrees Celsius may cause damage, while temperatures of 47 degrees Celsius cause death of these plants.

Oil pollution, such as our recent spills in the Gulf of Paria, prevents light penetration and gaseous diffusion necessary for the continued existence of these plants.

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SEA-GRASSES provide food for creatures like the manatee.

ENVIRONMENT

Seagrass provides food, lessens carbon dioxide



● GARDEN from Page 1B

The anchoring of tour boats in Tobago may be responsible for the lack of sea-grass meadows in some areas and the scraping of the seabed with drag nets or trawl nets quickly destroys sea-grass meadows.

The construction of jetties and dredging of harbours to facilitate new deep-sea ports for cargo vessels, lead to alterations of current patterns and the erosion and deposition of sediments which disturb the habitats of sea-grass meadows.

My first encounter with these unique beds of plants or meadows occurred when I was an undergraduate student of the late Professor Peter Bacon. Unlike the typical zonation pattern outlined at the beginning of this article, the meadows we visited were in William's Bay, Chaguaramas. There are no mangroves or coral reefs in this particular area, but the sea-grass beds provided shelter, camouflage and food for a variety of fin fish, shellfish and invertebrates.

Our lecturer and one of my mentors, made sure we all got wet, because we had to walk into the water to listen to our instructions on what exactly we were to do in the field that day. We took core samples of parts of the meadows and those of us who could snorkel, observed and recorded the diversity of organisms found in the sea-grasses.

Our laboratory analyses revealed that the below-ground biomass (the rhizomes or roots) was even greater than the green, leafy, above-



SEA-GRASSES are plants that grow underwater.

ground biomass within the sea-grass beds. The leaves themselves are similar to other green land plants, in that they also photosynthesise, that is, they use the sunlight with their green pigment, chlorophyll, to manufacture food or simple sugars like glucose. Like land plants, these aquatic sea-grasses provide a ready-feast for herbivores, such as graceful turtles, and prickly sea-urchins. Sea-grasses have also been known to be munched on by manatees.

The below-ground biomass is made up of a special type of root system called rhizomes (similar to ginger), which link many plants together along underground "runners". These rhizomes help to hold the soil together and sta-

bilise it. The leaves go through a natural life cycle of their own and as they age, they turn yellow and drop off in the silty substrate that they help to stabilise and fertilise with their organic enrichment.

Snorkelling among sea-grass beds reveals lots of hidden treasures, camouflaged fishes, such as gobies, rockfish, crabs and even starfish. The leaves sometimes have white patches of coralline encrusting algae and sponges. In some of the sea-grass meadows in Tobago, juvenile queen conch (*Strombus gigas*) may also be seen grazing on the decaying leaves, along with other invertebrates.

Sea-grass meadows provide a necessary link,

and serve as nursery areas, for fish and shellfish that migrate among mangrove estuaries and coral reefs as well as the offshore fishing resources. They stabilise the soil, reducing turbidity so particles do not suffocate coral polyps which may be close by. They also act as tidal buffers, by reducing the wave impact on the shore line.

Seagrasses fulfil many unique roles in our waters and sustain our lives by providing us with fish and shellfish as food and absorbing excess carbon-dioxide that may lead to global warming. Perhaps in reading this, we can become more mindful of our natural environment and try to conserve our bio-diversity. Why not enjoy a relaxing snorkelling adventure of exploration among sea-grass meadows, heightening your keen sense of observation to detect as many colourful or not so colourful organisms that live and feed there, without disturbing the habitat? Take as many photos as you like, and leave only bubbles. Protect and enjoy them for present and future generations of flora, fauna and human life.

Today's feature was written by **Natasha Mohammed**. For more information on our natural environment, you can contact the **Tribunal and Tobago Field Naturalists' Club** at admin@tfn.org or visit our website at www.tfn.org. The Club's next monthly meeting will be held on 13 November, 2014 at St Mary's College, POS.