



> THE THOUGHT OF A DIVING HOLIDAY TO THE TROPICS AND OTHER EXOTIC PLACES PROVOKES IMAGES IN THE MIND OF REEF LIKE STRUCTURES FULL OF COLOURFUL FISH AND MANY OTHER EXCITING CREATURES. BUT UP IN THE SHALLOWS OF MANY OF THE WORLD'S SEAS IS ANOTHER OFTEN OVERLOOKED HABITAT OF GREAT INTEREST TO ANY DIVER FASCINATED BY COLOURFUL AND EXCITING MARINE LIFE.

Seagrass meadows may be familiar to some, but certainly not to the majority of divers. These undersea meadows comprised of terrestrial plants adapted to life in the sea are a biodiverse wonderland full of creatures capable of delighting any budding naturalist.

Seagrass meadows are applauded for their value in providing food and habitat for charismatic species such as seahorse and green turtles, and the enigmatic dugong or sea cow. Having the opportunity to dive or snorkel with a dugong is somewhat rare due to their unfortunate low numbers and general shy behaviour. However taking in a shallow water dive or snorkel trip in places such as Shark Bay in Western Australia may well mean coming face to face with a dugong Hoovering its way through a seagrass meadow. Dugongs are herbivores and eat vast amounts of

seagrass, sometimes as much as 40kg in one day, creating visible feeding trails through the seagrass. Some researchers have found that dugong actually 'farm' the seagrass in order to favour species to their taste.

Tropical seagrass meadows are often the best place to get up close and observe a green turtle. These are another species that feed directly on seagrass, consuming on average 2kg per day. Fortunately for us marine enthusiasts, green turtles are often a little less shy than dugong and can often be observed feeding for long periods. Recent visits to great holiday locations such as Green Island off of Cairns, Australia and Pulau Gaya off Sabah, Borneo have resulted in great moments spent snorkelling with these graceful creatures.

The genus of species known as the seahorses (*Hippocampus* sp.) are also commonly observed in seagrass and

THE WONDER OF A SEAGRASS MEADOW

: DR RICHARD K.F. UNSWORTH,
SWANSEA UNIVERSITY, UK



Top left: Green turtle (*Chelonia mydas*), Shoalwater, Queensland

Bottom left: Leopard flounder (*Bothus pantherinus*), Wakatobi, Indonesia

Bottom right: Greater blue-ringed octopus (*Hapalochlaena lunulata*), Wakatobi, Indonesia

present great photo opportunities. These often difficult to find creatures once spotted tend to stay still and pose for the camera. Throughout southeast Asia it's common to see seahorses grasped around the base of a shoot of the large seagrass species *Enhalus acoroides*. Although the search for these creatures may sound a little arduous, it's what you find along the way that will be the real highlight.

There's much more to seagrasses than just these three delights. A typical seagrass meadow at first glance may on the surface look like it contains very little life, but this may depend on both timing and on detail. Looking closer into the productive canopy of a seagrass meadow bubbling away producing oxygen on a sunny day can be a treasure trove of interest. Seagrass meadows are famed for containing an abundant and productive invertebrate community, from baby prawns to large molluscs such as the hammerhead. Seagrass meadows in the tropics are full of interesting molluscs, such as deadly cone shells that can be observed slowly moving around hunting their prey by stealth, and the colourful



Top left: Messmate pipefish (*Corythoichthys intestinalis*), Wakatobi, Indonesia

Centre left: *Acropora* sp. coral living in a seagrass meadow, Queensland

Bottom left: Longhorn cowfish (*Lactoria cornuta*), Pulau Gaya, Borneo (Source: R Swann, DiveDownBelow)

Top right: *Halodule uninervis* producing oxygen on a sunny day in Fiji (Source: L J McMenzie, SeagrassWatch)



cowries and volutes waiting to be eaten by the next hungry octopus.

Hidden in burrows, under rocks, or hiding in a dead coral head within a seagrass meadow are all sorts of exciting creatures just waiting to emerge in the evening. A seagrass night snorkel can be a wonder of fun. It's the evening when creatures such as sea cucumbers, brittle stars, blue-ringed octopus, abundant shrimp and large crabs come out to play. This in turn brings a migrating hungry fish fauna ready to fill up. The fish communities of tropical seagrass meadows (dominated by emperors, rabbitfish and bream) are never quite as exciting as those out on the reef but however contain some genuine stars of the show that really do deserve to be seen (day and night). Species such as the longhorn cowfish (*Lactoria cornuta*), double-ended pipefish (*Syngnathoides biaculeatus*) and the banded snake eel (*Myrichthys colubrinus*) are truly spectacular, as are the large shoals of juvenile fish that sweep by.



Although these wonders of the natural world have huge importance for their biodiversity and the roles they provide as fish nurseries, water filters, and oxygen producers, like many of the world's habitats seagrass meadows are under threat the world over. Recent research has pointed to alarming loss rates of seagrass that are now equal to that occurring in tropical rainforests and on coral reefs. Seagrasses of the area the size of one football field are now being lost every half hour due to human impacts such as pollution and run-off, boating, dredging



and coastal development. Whilst we commonly see evidence from around the world about the loss of tropical rainforests, coral reefs, and wetlands it's easy to forget about seagrasses. But why does this really matter and how can anyone help?

In many areas of the world where meadows cover vast areas of the seafloor, they also have a major role in trapping marine pollutants. On the Great Barrier Reef in Australia, where pollution of land origin (i.e. nutrients, pesticides and sediments) is one of the current major threats to its long-term future, without seagrasses acting as natural water filters of this pollution, the very survival of the system would arguably have been in doubt long before pollutants reached their current levels.

For all those keen divers and fishermen, whether it is on the Great Barrier Reef, the Caribbean or temperate New Zealand, seagrasses require protection for the role they play in supporting coastal fish communities. For example, seagrass meadows in Southern Australia are critically important for the King George whiting fishery, and in Queensland for the prawn fisheries. Research is now providing increasing evidence of the role that seagrass play in the global carbon cycle. Seagrass meadows have key roles in trapping the increasing amount of carbon dioxide in the atmosphere, and possibly result in localised mitigation of the negative effects of ocean acidification (e.g. on coral growth).

Convincing governments to help protect seagrass meadows requires people who understand these habitats and support such action. When communities such as dive clubs and groups learn to understand the value and beauty of these habitats in their local region and the factors



potentially influencing them, then conservation actions can often be locally driven.

In many parts of the world, community and volunteer groups have learnt about seagrasses and developed strategies to protect them by starting up volunteer monitoring programs such as SeagrassWatch. For example, community driven seagrass monitoring using the SeagrassWatch protocols in Singapore – the world's largest container port – has considerably raised the profile of these habitats in the conservation agenda. This will hopefully lead to at least some of their protection in the long-term, rather than their complete loss in a location where large coastal developments are a continual threat to the existence of seagrass.

So get out there! Find your local seagrass meadow, or find one on your next dive trip and go for a shallow dive or snorkel with your camera. You'll be amazed at what you come back with! Hopefully this might inspire you to help protect your local seagrass meadow too.



Top left: Banded sea snake (*Laticauda colubrina*), Wakatobi, Indonesia

Bottom left: Unidentified hermit crab (*Paguroidea* sp.), Pula Gaya, Borneo, (Source: R Swann, DiveDownBelow)

Bottom right: Chocolate chip starfish (*Protoreaster nodosus*), Bali, Indonesia (Source: L J McMenzie, SeagrassWatch)

LINKS>

World Seagrass Association
www.worldseagrass.org

SeagrassWatch Community Monitoring
www.seagrasswatch.org

Seagrasses in Decline
www.bbc.co.uk/nature/13441738

Seagrasses in Europe
www.seagrasses.org

Seahorse and Seagrass Conservation
www.theseahorsetrust.org
www.projectseahorse.org

Seagrass restoration
www.seagrassgrow.org