

# Seagrass-Watch



## news

Issue 29 • June 2007

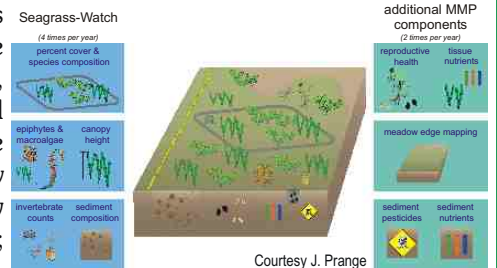
Seagrass-Watch has certainly been productive over the last few months: training workshops have been held in Singapore, Queensland (Townsville) and the Philippines; Great Barrier Reef Water Quality monitoring has been completed; additional monitoring locations established; and most sites have conducted monitoring.

In this issue you can read reports from several of the regions & countries currently participating in the program. Read about the RWQPP monitoring adventures from Queensland's far north to the south, including an interesting discovery at Hamilton Island. You can also learn why Seagrass-Watch participates in Reef Plan MMP and read the experiences of Yogi and Nicky from Fiji, who helped monitor 8 sites in 4 days (a champion effort).

Catch up with the Townsville teams, what they've been doing and their "identity crisis"! Hear from the Torres Strait teams and their trip to Cairns. Learn how DPI&F are protecting seagrasses and hear how the award winning Great Sandy Strait team has been keeping busy. Read about a study examining turtle diets in Eritrea and the Bolinao Seagrass Demonstration Site. Margaret Parr gives her last report on the Whitsundays before heading south, and Ria fills us in on the adventures of Team Seagrass in Singapore. Happy reading!

### Great Barrier Reef WQ monitoring

The third round of Reef Water Quality Protection Plan (RWQPP) Marine Monitoring was successfully completed in April/May. The monitoring is pre and post tropical wet season (October and April respectively) each year, and targeted at the major marine ecosystem types in the Great Barrier Reef region most at risk from land based sources of pollutants. Intertidal seagrass meadows are one of the targeted ecosystems. Monitoring is based on Seagrass-Watch standard methodology, plus additional components, including: edge mapping, reproductive health (flowers), sediment nutrients, sediment herbicides, and seagrass tissue nutrients. This season saw the expansion of the monitoring to include: new sites at offshore islands; within canopy temperature monitoring at all RWQPP sites; and trialing light loggers.

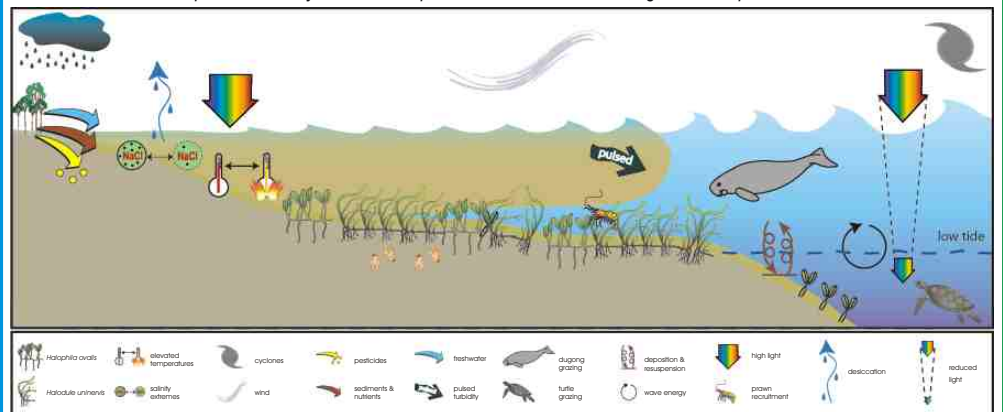


Monitoring to date has highlighted that seagrass meadows are dynamic; coming and going on time-scales of months to years. However the interrelationship between human mediated influences and normal population changes in seagrass meadows in the GBR are poorly understood. In the past, nutrients have been the factor most concentrated on when determining the effect of declining water quality on seagrass meadows. Seagrass habitats of the GBR have now been characterised by having low nutrient availability and being primarily nitrogen limited. A recent appraisal of the relationship between seagrass biomass, tissue nutrients and sediment nutrients determined that something other than nutrients was limiting seagrass growth in intertidal meadows. The most likely factor is light. This coupled with the predictions of climate change such as rising sea temperatures, increased storm intensity and wind speeds and further decreases in water quality (turbidity or water clarity), could exacerbate the impacts of low light availability already being experienced by coastal seagrass meadows. For these reasons, light and temperature are the new monitoring components which have been introduced to improve our understanding of drivers of changes in seagrass abundance and distribution in the Great Barrier Reef region.



Naomi (SW HQ) installs a light logger at Bushland Beach

Conceptual diagram of coastal intertidal seagrass meadows in the wet tropics of north eastern Australia: general habitat and processes. Major drivers are pulsed runoff from the land, light and temperature.



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Seagrass-Watch acknowledges the traditional owners on whose sea country we monitor

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For more information about the Reef and Rainforest Research Centre visit <http://www.rrrc.org.au>



# Far North Queensland

## Seagrass-Watch Fiji visits Far North Qld: 8 sites in 4 days

Masao & Nicolette Yoshida  
report

We arrived in Cairns April 14th and were very fortunate to be able to join Len & Rudi (Seagrass-Watch HQ) at Yule Point, Green Island, Luggier Bay & Dunk Island for Seagrass-Watch and Reef Water Quality (RWQPP) monitoring. While we had visited Green Island and



Yule Point

Luggier Bay (Mission Beach) previously, Yule Point and Dunk Island were a first. We were looking forward to the experience, as we are from Fiji and we conduct Seagrass-Watch monitoring on the Island of Ovalau.



Dugong feeding trails at Yule Point

**Day 1** - Yule Point. It was quite windy but apart from that the day was perfect. The two sites (YP1 & YP2) were monitored and the highlight of the day was seeing the dugong feeding trails that Len pointed out. We don't get dugongs in Fiji and so to imagine these sea mammals feeding on the seagrass was great.



Green Island: Len (SW HQ) monitoring GI2

**Day 2** - Green Island. Travelling out to Green Island is always a most enjoyable experience. The day was fine with slight winds. It never fails to amaze us to see the life out in the reef and in the seagrass meadows. Clams ("vasua" in Fijian) lying close to the shore and beche-de-mer ("dairo") in abundance. If only Fiji had the same enforcement as the Marine Parks in Australia do. We also saw a couple of turtles swim up close to the beach at high tide, feeding on seagrass. It was nice to see, as in Fiji this is unusual because the sale and consumption of turtle meat is still very common; even though Fiji currently has a 5 year moratorium which bans the sale of sea turtles.



Above: Green Island: Nicky and Masao (Yogi) collecting seagrass samples

Below: Setting up at Luggier Bay, Mission Beach



Some even helped us with the water quality collections.

**Day 3** - Luggier Bay (Mission Beach). The isolation of this area is amazing. During the monitoring the only visitors to the beach were the wallabies. The meadow was not as lush as that of Green Island and Len told us that the area had been severely impacted from the effects of Cyclone Larry in March 2006. The weather was fine and the sites were very dry due to the very low tide.



Luggier Bay: Running the transect. Dunk Island in the background



Monitoring the new Dunk Is sites, DI1 and DI2

**Day 4** - Back at Mission to catch the ferry for a 25 min ride across to Dunk Island. Seagrass-Watch HQ was establishing a new site on the island as part of the RWQPP monitoring, and to be part of this was most exciting. Len and Rudi waded through waist deep water on the southern reef-flat of the island, looking for seagrass and a suitable site to monitor. When it looked as if setting a site up would not happen, the tide dropped sufficiently to reveal a meadow, large enough for two sites. The two sites were set up, monitored and completed in time to see us head back to Mission Beach on the ferry at 4.30pm.



Above and below: Halodule uninervis and Halophila ovalis growing on the southern reef flats of Dunk Island



Seagrass monitoring is very exciting and important, and we are very happy to be able to be a part of Seagrass-Watch. 🌱

### Dunk Island

Dunk Island lies 4 km off the Australian east coast in the Pacific Ocean, opposite Mission Beach, Queensland. It is the northernmost and largest of the Family Islands group, rising to 271 metres at its peak. Dunk Island National Park covers 7.3 km<sup>2</sup> while an airstrip, resort and farm cover the remaining 2.4 km<sup>2</sup> in the north-west. The Indigenous Australian name for Dunk Island is Coonanglebah, "The Island of Peace and Plenty." It received its European name from Captain Cook in 1770 after George Montague-Dunk, 2nd Earl of Halifax.



Image courtesy of www.dunk-island.com



# Queensland

## RWQPP Townsville to Gladstone Roundup

Naomi Smith reports



Reef Plan MMP sampling in April was successful as Jane Mellors, Iony Woolaghan, Catherine Walsh, Shenade Muller and myself sampled the eight sites at Townsville, Mackay and Whitsundays in one week. The highlight of the trip was establishing a suitable Seagrass-Watch site at Hamilton Island.

The intertidal shore of Catseye Beach on Hamilton Island varied from reef top to sandy flats. Along the sand flats, directly in front of the Resort, we observed a large sparse patch of *Halodule uninervis* and *Halophila ovalis*. It was at this location that we monitored 30 random quadrats. In the reef top habitats to the right and to the left of the Resort, we observed seagrass meadows consisting of sparse patches of *Thalassia hemprichii* with high algae cover as well as seagrass meadows with a variety of species. In total we observed 6 species including *Thalassodendron ciliatum* which was very surprising as this is the furthest south it has been observed in the pacific. Hopefully, after more investigations in July, one or two sites at Hamilton Island can be added to the Seagrass-Watch "family".

The next round of sampling was at Ross Creek (RC1) and Wheelans Hut (WH1), Shoalwater Bay. The team from CQU/CEM (Kelly Jacobs, Kirsty Small, Ashley Bunce and Andy Davis) took me under their wing as this site involves camping in the Army training ground for 3 days. A 4WD vehicle was required to drive to both sites and then we had to walk in ankle to knee deep mud to the Seagrass-Watch sites. This area has huge tides (7.5m) and the seagrass meadows go on for as far as the eye can see. It was an amazing sight. The main species found at these sites were *Zostera capricorni* and *Halophila ovalis*. We saw up to 20 turtles, beached, waiting for the tide to come in and we were able to measure one turtle's shell and it was 104cm! During the morning, while waiting for the tide to drop, we walked around the top end of Sabine Point and it was here that we saw dugongs and an abundance of marine life.



The RWQPP team. LTR: Catherine, Jane, Shenade, Naomi and Iony



RWQPP monitoring at Shelly Beach, Townsville



An exciting find - *Thalassodendron ciliatum* on Hamilton Is. Possibly the most southern record for the species in the Pacific Ocean



I would like to thank the CQU/CEM team for their hospitality and especially Andy for his bush cooking and his 4WD



adventure!!!

On the 15th May, Iony Woolaghan and I embarked on an adventure to the beautiful Great Keppel Island in search of a new Seagrass-Watch site (Hey someone had to do it!!) We exhaustively searched 3 beaches (Leekes, Putney and Fishermans) on the North West side of the island on the one low tide.

The sediment along these beaches was compacted fine sand, only changing at the end of Leekes Beach where the sand became a little coarser with some shell grit. We observed seagrass (mainly *Halophila ovalis* and *Halodule uninervis*) washed up along Putney and Leekes Beaches. At Leekes and Fishermans Beaches only very sparse patches of intertidal seagrass meadows were observed. Whereas, along Putney Beach we found a large patch of sparse seagrass meadow (mainly *Halodule uninervis*) so we decided to set up a Seagrass-Watch site. Unfortunately, due to the sparseness of this meadow most of the seagrass did not fall within our quadrats.

On the next field trip it would be a good idea to investigate both Monkey's and Long Beaches on the south side of Great Keppel Island. The quantity of seagrass washed up along the beaches leads us to believe that there must be a very healthy subtidal seagrass meadow growing off the island.

Our long days didn't end there as the next day we drove to Gladstone to sample the two sites on the south end of Curtis Island. We are greatly appreciative to Queensland Boating and Fisheries Patrol (QBFP) for taking us out to the sites, as navigating through Gladstone Harbour, especially at low tide, can be very difficult. We then had to walk 1.2 km to the sites, luckily, the sediment was sand/mud, although at some points around GH1 there was ankle deep mud. The dominant species at these sites was *Zostera* and a high algae cover was observed. Thankyou to Iony for a successful and enjoyable field trip. 🌱



Iony searching for seagrass at Leekes Beach



*Halodule uninervis*, Putney Beach, Great Keppel



Monitoring on Gladstone Harbour



QBFP arriving at Curtis Island, Gladstone Harbour



Turtle measuring 104cm (left) and the CQU/CEM team (below), Shoalwater Bay





# Townsville Region - Queensland

## Townsville-Thuringowa Seagrass-Watch



Posa Skelton (TTSW Local Coordinator) reports

Sky-wonkies (weather experts) have been seen proclaiming that the El-Nino has sufficiently shifted to break the long-standing drought in most parts of Australia. For us, the Seagrass-Watchers of the twin-cities, it meant pleasant days out on the exposed seafloor watching the green seagrass grow. Furthermore, the low-tides were in our favour allowing for a good afternoon picnic after the surveys. The month of April was the busiest for our monitoring group, with the Northern Beaches Rotary kick-starting the surveys on the 14<sup>th</sup> April, which was followed by the Shelley Beach seagrass-watchers under the guidance of the Mundingburra Rotary on April 15. Our friends from the University of the Third Age were out and about seagrass-watching a couple of days after the Shelley Beach survey, at their Cockle Bay site, over at Magnetic Island. In May, only one monitoring was undertaken, at the second site at Shelley Beach. Our many thanks to Jane Mellors (SWHQ) for leading that survey.



Out of the marine meadows, our partners and supporters at the Conservation Volunteers Australia and the Qld. Department of Primary Industries and Fisheries have been busy promoting Seagrass-Watch to schools. School presentations and tours were carried out as part of the International Wetland Day. Preparations were well under-way for a hype of environmental activities for the Environment Week (June 3-8<sup>th</sup>). Our group held two displays over the weekend (June 2-3<sup>rd</sup>). The Fishing & Boat Expo at Cluden Park, attracted a lot of fishing enthusiasts. Having a Seagrass-Watch stall there was the appropriate way to remind the community that sustainable fishing can only be achieved by looking after the fish habitats, especially our seagrass beds.



The Townsville Ecofiesta gave us the opportunity to promote and recruit new members. There were plenty of children's activities, and by far the most popular was the badge making exercise (until the badge machine decided to have an eco-siesta). Our seagrass meadow was also popular with the community writing conservation messages

on seagrass leaves. We also had a touch-tank display, kindly donated by the North-Queensland Algae Identification Facility at James Cook University.



As we conclude the second quarter of Seagrass-Watch activities, we acknowledge the great progress made in our region, we look forward to what looks to be busy months of June-July out on the seagrass meadows counting seagrass seeds and estimating seagrass cover. Of course the balmy tropical winter of North Queensland is just another reason why you should join us to watch the seagrass grow. 🌱

## Identity Crisis

That's it we need an identity!!! Over the years we've been the The Townsville-Thuringowa Seagrass and Mangrove Watch, Twin City Tidings, Townsville Seagrass-Watch, and just plain old Seagrass-Watch (which gets confusing between the methodology and the people). So now is the time to give us a handle - all suggestions can be emailed to Posa Skelton (Townsville-Thuringowa Seagrass-Watch Local Coordinator) at [skeltonp@bigpond.net.au](mailto:skeltonp@bigpond.net.au) or even posted to him c/- PO Box 1085 Townsville Q 4810. Who knows there may be mystery prize for the best suggestion. 🌱

## Sea Hares



Sea hares are small marine gastropod molluscs of the suborder Anaspidea (P. Fisher, 1883) in the subclass Orthogastropoda, class Gastropoda, phylum Mollusca. Their common

name derives from the projections on their bodies which somewhat resemble rabbit ears. Their scientific name (Anaspidea) is derived from the Greek for "without a shield" and refers to the lack of the head shield which characterises other members of the Opisthobranchia.

Sea hares are large, bulky creatures, reaching a length of up to 75 cm and weight of up to 2 kg. They have soft bodies with an internal shell and are all hermaphroditic, acting as male and female simultaneously, even during mating.

Sea hares are herbivore/herbivorous and are typically found on seaweed in shallow water. When there is a shortage of food, they burrow themselves. They have an extremely good sense of smell. They follow even the faintest scent with their rhinophores, which are extremely sensitive chemoreceptors. They will only eat seaweed that matches their colour; if the slug is red, it will feed on red seaweed.

They rely for protection on their coloration, which camouflages them from predators. When disturbed, a sea hare can release ink from its ink glands, providing a potent deterrent to predators such as sea anemones. This release acts as a smoke screen, while, at the same time, affecting the scent of their predators. The color of the ink is white or reddish, depending on the color of the pigments of the seaweed. Their skin contains a similar toxin that renders sea hares largely inedible for many predators.

Source :[http://en.wikipedia.org/wiki/Sea\\_hare](http://en.wikipedia.org/wiki/Sea_hare)



# Townsville Region - Queensland

## Bushland Beach April Survey

Posa Skelton and Lux Foot report



Lux Foot and Posa Skelton, BB1



Tav and Iony, collecting for RWQPP



Afroz, Posa, Sayaka, Jenny and Wendy on transect 3



Bushland Beach Site



Working on Transect 2



Shenade with Jane Mellors



On Saturday 14th of April we ventured out to monitor the Bushland Beach meadow for our 2nd Seagrass-Watch survey of the year. Lux, armed with his yellow mobile-size GPS (provided courtesy of Conservation Volunteers Australia) led the way to the permanent marker, where Jane Mellors and her RWQPP team were now congregating after the completion of their research. Lux took charge, and Jackie and Jenny (Rotary members) began laying out the transects as the rest of the group teamed and divvied up the tasks (there were 24 of us all together which helped to make monitoring easy).

The gale force winds over the past two weeks had done a lot of damage to the meadow, fresh blow outs and the tide had scoured the seabed leaving seagrass rhizome exposed at the edge of temporary tidal pools. Another fascinating observation was the many baby trochus that were seen in and around our quadrats. This certainly affirms the fact that seagrass meadows are great nursery areas for marine species, especially the commercially important ones. We also noted that the seagrass had begun to re-established in some of the old blow outs.

With great team effort and many extra pairs of hands, monitoring was completed in two hours. We gathered on one of the un-scoured and exposed seagrass patches to complete our traditional group photo and headed back to the shore, where the remaining members of the Northern Beaches Rotary were already laying out the barbequed fare and crisp cold drinks.

This was an enjoyable day. We will continue to learn more every time we visit this and our other sites in Townsville. The Townsville-Thuringowa Seagrass-Watch group would like to thank our hosts the Northern Beaches Rotary. ♥

## Shelly Beach

We were a small group but an effective one on Thursday, 17<sup>th</sup> May and it was great to walk over to the site via the sandbanks rather than trudging out through the mud!!!! It was great to see Sue Wilson applying her new found Seagrass-Watch knowledge (March Seagrass-Workshop participant, for more on the workshop see issue 28).

Absolutely unbelievable effort by Julia who got straight off the plane from Brisbane and convinced Carole that they should go Seagrass-Watching. Brilliant!!!! Percent covers were slightly down (not surprising, given the strong winds we have had recently), seed counts were still relatively high and faunal recruitment to the site made the monitoring session really interesting.

We had sea hares, looking remarkably like hairy caterpillars as they head to tailed it through some of our quadrats, in addition to lots of tiny oyster-like bivalves along the seagrass leaves. We also noted some other species of seagrass (*Cymodocea serrulata* and *Halophila spinulosa*) that we don't find within SB2, as we traversed the meadow on our homeward leg.

As always at this time of year in Townsville, it was an absolutely glorious day and it felt great to be outdoors amongst it!! ♥



The Shelly Beach Crew



Sue Wilson putting in practise what she learnt at the Townsville workshop



Sea hares at Shelly

## Excellence Award



Posa Skelton the local co-ordinator for the Townsville-Thuringowa Seagrass-Watch received an award during Townsville's week long celebration of World Environment day. He was awarded *The Townsville City Council's Sustainability and Environmental Excellence Award for Individual Initiative for Raising Awareness of Marine Conservation* on Wednesday June 6<sup>th</sup>. The award was in recognition for his tireless and significant contribution towards environmental protection and improvement in Townsville. Seagrass-Watch HQ would like to congratulate Posa on his award. Well done!! ♥





# Queensland

## Cockle Bay, Magnetic island

Don Kinsey (U3A) reports



The April monitoring by our U3A Earth and Sea Class was carried out on the 17th April. Adam King (Conservation Volunteers Australia) met with us and came around to the site with me. He gave our group several pairs of booties, a comprehensive first aid kit, and a submersible film camera.

These April observations were very different to those of last April. In view of the enormous difference in meteorological conditions between years, that is probably not too surprising. Conditions have been windy and almost totally dry for some weeks. *Halophila ovalis* was completely absent from our transects. *Cymodocea serrulata* was even more dominant than in February, and exhibited very high cover. *Halodule uninervis* was present in minor amounts in the outer sections of the transects, and we found no *Thalassia hemprichii*.

Algal cover was nearly absent over the majority of quadrats on transect 1 and 2. As usual, Transect 3 with its sparser seagrass cover, exhibited more algal cover. Foliose reds were essentially absent along transects 1 and 2 though there was limited occurrence on Transect 3 and in the general area. *Halimeda spp* were of only sparse occurrence. Other algae with even more sparse occurrence in the general area of the transects were: *Sargassum spp*; *Padina sp*; and the very occasional *Dictyosphaeria* on rocks etc.

The higher ground from the inner ends of the transects back to the beginning of the mangroves exhibited only sparse but general *Halophila ovalis* cover which was stunted and dark in colour. There were patches of very narrow leaved *Halodule uninervis*, but no *Zostera capricorni* on this occasion. There was also no evidence of the Enteromorpha- type green filamentous alga so dominant on this higher ground last April after the heavy rains.

Epi-cover was a fine muddy diatomaceous layer with no significant occurrences of epi-faunal and epi- algal crusts. There was virtually a total absence of epi-cover by the usual turf algae and diminutive foliose red algae. Green sponges again were quite common in the transect area. As usual, seed occurrence was very low- in this case zero. 🌱



Catherine's last Seagrass-Watch field trip.

## Picnic Bay, Magnetic Island

Naomi, Jane, Iony and Catherine monitored MI1 in late April (Thursday, 19<sup>th</sup>) as part of the suite of sites monitored for the RWQPP. It was fantastic to see that our new method of marking the site proved to be successful. This is one of the worst sites for losing site markers and therefore temperature loggers, so here is hoping. It was a fairly routine monitoring with no big surprises average per cent covers and

no seeds!!! The site did look rather brown though as the tips of the seagrass were all burnt. This monitoring also coincided with Catherine's last Seagrass-Watch venture before she took up her new job in Toowoomba (not much seagrass there).

The Townsville Seagrass-Watch team would like to wish Catherine all the best for her future and hope that if she is visiting her parents in January she might consider coming out and doing some midnight monitoring for old time's sake - thanks Catherine for all your assistance over the years. 🌱

## "Seagrass Watch" Bowen

Jane Mellors (Seagrass-Watch HQ) in collaboration with the Bowen State School established and monitored a new site (BW1) at Front Beach, Port Dennison. The site is a mix of *Halodule uninervis* and *Zostera capricorni*. There were also small amounts of *Halophila ovalis*, all great dugong food. The site will be monitored by the Year 7 students as part of their Environmental, Reef Guardian Program.



Carli DeLuci (BSS) reports.

On Friday the 27<sup>th</sup> of April, 21, year seven students walked down to Front beach to complete our first seagrass monitoring. As part of our Environmental Program 2007 we have decided to monitor the seagrass meadow at the Front Beach with the help of Seagrass-Watch HQ.



*Halodule uninervis* and *Zostera capricorni* dominate Front Beach

Before we left the school grounds Jane Mellors (Seagrass-Watch HQ), gave a talk to the year 7 students and teachers about the program. Jane also explained to and taught us the importance of seagrass and the different species of seagrass we would find.



Students under Jane's guidance monitor BW1

When we reached Front Beach we divided into 5 groups, each having a task to complete. Three groups did transects examining the seagrass, one group took photos and the other group sampled seagrass seeds.

The year seven students successfully completed the tasks and the data was sent to



Seagrass-Watch HQ for further study. We will receive our own Seagrass-Watch Monitoring Kit from the Burdekin Dry Tropics NRM this term. We were very proud of our efforts and look forward to continuing the "Seagrass-Watch" program in 2007. 🌱

## Bowen

Bowen is located in the dry tropics, on the NE coast of Australia, halfway between Townsville and Mackay. The town enjoys a diversified and prosperous economy based on agriculture, fishing, tourism, and mining. Just north of Bowen is the Abbot Point coal loading port. Coal is mined inland of Bowen and is exported mainly to Europe and Japan. Bowen also has an evaporative salt producing facility. It uses only seawater and sunlight to make salt, without burning fossil fuels. This is only possible because of its dry tropical climate. Most of the table salt



# Queensland



## Great Sandy Strait

Gordon Cottle reports

After the euphoria of our Award win (see Issue 28) it was back to business on 3rd



March when Robyn and Hanne again walked to the island site at Boonaroo (BN2) where the grass cover was very similar to September 2006.

On the 17th March we met up with Len and Rudi (Seagrass-Watch HQ) at Tinnanbar (TN3) where we recorded greater *Halodule uninervis* cover at transect 3 than the other sites. This was also confirmed by seed monitoring, with 5 whole and 18 half seeds.

After a brisk walk back to TN2 we found patchy *Zostera capricorni*, which was lower than November 2006. Robyn tried her first seed monitoring (finding only 6 halves on the site), before we were beaten by the tide. A very welcome and interesting meeting for all of us.

Unfortunately, in April we did not get the opportunity to get out, with both Robyn and I in hospital. I did, however, travel to the Tannum Sands / Boyne Island BMRG Coastal

dugong feeding trails throughout. Are these results a consequence of no local rains or flooding from the adjacent local residential area?

On Wednesday Pat and I went to Tin Can Bay to meet up with Cheryl List (BMRG Schools Officer), Maree Prior (Cooloola Coastcare Coordinator) and four other CoastCare Volunteers, one of whom (Lee), initially laid out the TB1 site. We were fortunate that all the pegs were still in position, the substrate is rock and shell, with an algae growth throughout. We did record some sparse *H. uninervis*. However, by removing some rock and shell good rhizome was revealed, and it would appear that the seagrass is struggling to get through.

At the same time Robyn and Hanne walked to PN3, for the last time I believe, having seen Robyn's photos of Hanne (who then fell backwards herself - she wouldn't surrender the camera to Hanne). The cover still remains around 1 - 2% comprising *H. uninervis* and *H. ovalis* with epiphyte to 100%. At transect 3 was a patch of *Halophila spinulosa*, unusual to see intertidally.

Come Thursday and we are at Tinnanbar TN1 The seagrass cover was a sight to behold with extensive *Zostera* cover to 40%, *H. ovalis* was also evident, with sparse *H. uninervis*.

With favourable weather conditions over the weekend Robyn and Hanne in Paul's boat went to Reef Islands. RI1 maintains a good average cover from 20 to 30% *Zostera* with some *Halophila ovalis*. RI3 showed clean seagrass mainly *Zostera* of 25 to 30% cover.

Another fine day on Sunday 20th saw Robyn, Sarah and Paul at RI2 where the usual average cover to 25% remains. Another outstanding effort by the Team, Nine sites in six days! 🌱



(Left to right) Pat Cottle, Hanne Larsen and Robyn Bailey on site at Tinnanbar



Hard at work, Gordon in the background doing seeds



Len McKenzie (SW HQ) quizzed about monitoring protocols



Above: Dugong feeding trails at Tinnanbar

Forum and gave a PowerPoint presentation on seagrasses in the Great Sandy Strait. It was well received by an interested and very interesting group of local volunteers. The day was rounded off with a visit to the Rio Tinto alumina smelter.

On the 14th May Pat and I drove to Poona Palms Caravan Park and set up camp for the week. In the afternoon we met Hanne at BN1 where the overall seagrass cover was well up on February 2007: averaging 12% + *Zostera* & *H. ovalis*.

The following day Robyn joined us at Poona PN2 which showed an amazing recovery from February with seagrass to 12 & 15%, only 13 quads with no grass. We proceeded to PN1 on an excellent 0.2 m tide, giving us about a four hour window. The overall seagrass cover was double the February reading, with



The Team back at Poona



Dugong feeding trails on site at Poona



Gordon Cottle (third from left) with volunteers at Tin Can Bay



Hanne Larsen "stuck in mud" at Poona, site 3



Tinnanbar: Hanne and Pat, another site wrapped up



A dead turtle found at Reef Islands



# Queensland

## Pionner Bay, Laguna and Midgeton (Whitsundays)

Margaret Parr Whitsundays Seagrass-Watch local coordinator Reports



Pioneer Bay monitoring on April 17th was a joint effort between QPWS Volunteers and Jane Mellors (SW HQ) and her very able helpers. Their help meant we were able to complete work on the 4 sites in one afternoon.

The mud we have become accustomed to is still there but now mixed with an algal bloom. It is amazing how the seagrass is able to battle through adverse conditions in the Bay. Sadly we said au revoir to Eileen Lavis who is leaving the Whitsundays. Thank you Eileen for all your excellent work over the past 5 years, we enjoyed having you as part of our team.

At Laguna, Bruce and myself observed that there has been a lot of wave action around the site. The site peg was buried and seagrass looked healthy although there was not much of it. We did note many gastropod sacks on the site.

Helen Debnam, Carolyn Williams, Michelle St Martin, Betty Wilson, Bruce Parr and myself spent a memorable afternoon at Midgeton. We saw



Seagrass smothered with algae, Pioneer Bay, April 2007



Below: Dugong feeding trails at Midgeton



Below: Pioneer Bay site covered with algae



Above: Dugong feeding trails recorded for the first time at Midgeton



dugong feeding trails for the first time on this site and a new seed count record was made see below. The sites looked healthy and were also being enjoyed by a jabiru fishing in one of the ponds left by low tide and two green turtles.

QPWS ranger Carolyn Williams is also leaving the area. She has supported Seagrass-Watch for a number of years not only as our liaison with QPWS but as a volunteer. Thank you for your help Carolyn. You are leaving us happily holding "the most seeds in one core record", 21, recorded recently at Midgeton - smashing the previous record of 17 seeds by Betty Wilson and Geoff Bunn. 🍀



Carolyn Williams, Midgeton "Champion seeder"

*"I'm doing my bit to look after it!"*



Whitsunday's crew, together for the last time

## Dingo Beach

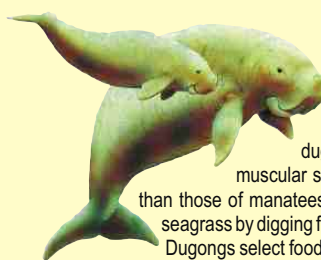
Carolyn Williams reports

Taking photo's and searching for seagrass seeds for the first time, Damien Head proved he had good skills at Dingo Beach, while Kerry Harrison and Wendy Galloway completed the transects. The tide came in quicker than a speeding bullet so the team retreated to a shady spot for lunch after a job well done. The seagrass looked healthy, was fairly uniform throughout the site and some seeds were found. 🍀



Dingo Beach

## Dugongs



Dugongs are particular about their diets, with certain 'meadows' of seagrass grazed. Dugongs are referred to as 'sea cows' because their diet consists mainly of seagrass. Unlike manatees, dugongs are exclusively benthic feeders. The muscular snouts of dugongs are more dramatically tapered than those of manatees. Their primary feeding mechanism is uprooting seagrass by digging furrows in the sea-floor with their snouts.

Dugongs select food on the basis of high nitrogen, high starch and low fibre levels. The order of preferred seagrass species for dugongs is *Halophila ovalis* > *Halodule uninervis* > *Halophila spinulosa* > *Syringodium isoetifolium* > *Zostera capricorni*. Feeding trails are commonly seen in low density meadows (10% -30% cover) of *Halodule* or *Halophila* on sandy intertidal banks. Feeding trails have however been recorded down to 33m in the far northern section of the Great Barrier Reef.



# Queensland

## Midge Point Survey

### Wenzler Family report

We surveyed the Midge Point sites on Saturday April 14, 2007. It was great to be out surveying the seagrass meadows again. It amazes us that every time there is something different to be found or seen. This time was no exception.

The day was cloudy and a storm was on the eastern horizon as we left the shore for our 1km walk through the mud to our sites. Over the years we have become adept in getting to and from our site through the mud without getting up to our knees in mud.

This time we noticed that most of the seagrass was covered in mud and water in the pools was muddy. We were soon to find out why - that storm on the horizon made good time and hit us just as we arrived at the first site and gave us a good and thorough drenching.

The sites were a little thin this time. One of the quadrants that was surveyed, had little *Halophila ovalis*. When we first started surveying these sites over 5 years ago we had almost 100% *Zostera capricorni* but over time *Halophila ovalis* slowly increased. But on this monitoring event, *Halophila ovalis* had decreased (I wonder if it has something to do with which month we actually do the survey in?)

We also noticed that the surface sediment of the mudflats were different, besides the rain splattering most of the "topsoil" (or should I say "topmud" was washed away and the courser shell/mud matrix was visible.



Midge Point site



Tara and Jennifer drenched!!



Estimating percentage cover



Turtle found in a pool of water at Midge Point



Fibropapilloma tumors on a turtle at Midge Point

On a different note, we came across two turtles in our survey. One was just resting in a shallow pool near one of our transects. Upon closer investigation we noticed that this turtle was not well. It had numerous growths on its soft tissue under the shell, neck and eye. We rang the QPWS animal helpdesk to see if there was anyone who thought that this turtle should be investigated or researched (or helped medically). After talking to the person on duty, and leaving our contact phone number, we continued on our seagrass survey.

Finally, as we walked over to the sites, we noticed all the rocks covered with hundreds of tiny dead bivalves. Again, we had never seen them before, although it did remind us of the time a while back where we had hundreds of live bivalves living on the seagrass leaves themselves. 🍀



### Fibropapilloma tumors

Fibropapilloma (FP), is a form of herpes virus which causes wart-like growths on the turtles. They may become quite large on the exterior and interior of the animal. Based upon the location of these growths it makes it difficult or impossible for the sea turtle to eat due to obscured vision, a mouth sealed shut, or flippers with limited mobility.



Fibropapillomatosis of sea turtles is causing an epidemic amongst sea turtles. Sea turtle fibropapillomatosis, was first discovered in 1938. In 90% of the cases, FP and herpesvirus are both present. All cases report a max. 2cm between the FP and herpes spots. These results lead to the conclusion that a chelonian herpesvirus is regularly associated with fibropapillomatosis and is not merely an incidental finding in affected turtles.



In the 1990's, it was thought that this was a deadly condition for sea turtles and would quickly lead to the extinction of all sea turtles. New research shows that larger species can and will recover from the disease.



Fibropapillomas occur in other species besides sea turtles, such as cattle, camelids, cervids, and sheep. These tumors are benign and may spontaneously regress. Treatment consists of surgical removal, though tumors may recur if the tumors are not entirely and fully removed from the turtle's external covering. But, if the tumors are internal (growing on the lungs and trachea and also inside the throat) the turtle will not recover and will sooner or later die from the deadly disease. Fibropapillomas in species other than the sea turtles are thought to be caused by the bovine papillomavirus or closely related viruses.

<http://www.answers.com/topic/fibropapillomatosis>  
<http://en.wikipedia.org/wiki/Fibropapillomatosis>





# Protecting Seagrass

## Seagrass worth protecting

Louise Johns (Fisheries Biologist DPI&F) reports



Most avid Seagrass-Watch newsletter readers would already be aware that seagrass has vital links to fisheries. It is due to these links that the Queensland Department of Primary Industries and Fisheries (DPI&F) takes responsibility for managing and protecting fish habitats including marine plants. Marine plants include vegetation that grows on or adjacent to tidal lands. This description includes mangroves, saltmarsh, algae and, of course, seagrass.

Juveniles of commercially important species of Queensland fish such as barramundi, mullet, whiting, tailor, luderick, bream and flathead depend on seagrass meadows. Commercial penaeid prawns such as red spot king, brown tiger, grooved tiger and endeavour also live in seagrass meadows as juveniles. Shellfish such as some oysters and pearl shell are often more likely to settle and survive where there is seagrass. Juvenile and adult sandcrabs, mudcrabs and flathead are just a few species which spend most of their lives in seagrass meadows, where there is not only food but also protection from strong tidal currents and predators.



Above: An adult mud crab (*Scylla serrata*) exposed at low tide

Right: A juvenile emperor (*Lethrinus*) in the seagrass meadow of Green Island

Below: A juvenile sandfish or bech-de-mer (*Holothuria scabra*) emerges from the substrate of a seagrass meadow late in the afternoon.



Dugong grazing (feeding) trails at Yule Point



Seagrasses are important indicators of the 'health' of the marine environment. Human impacts such as excessive pollution from sewage discharge, oil and runoff, and physical destruction from dredging, uncontrolled bait digging, boat propellers and anchors/moorings can damage or destroy seagrasses.

Estuarine seagrasses in particular may be threatened by coastal development and nutrient, sediment and herbicides from catchment sources. Seagrass meadows are fragile ecosystems and any damage to these may impact on associated prawn and fish communities.

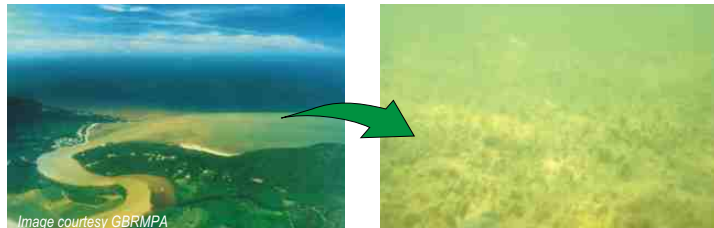


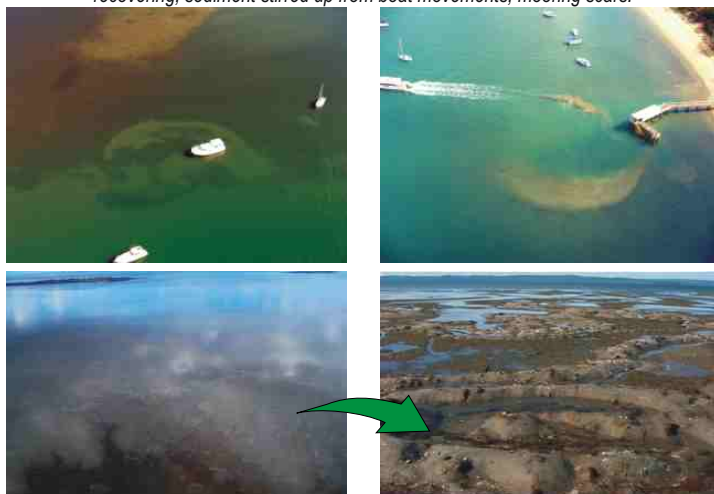
Image courtesy GBRMPA

Agricultural runoff during a flood event can lower light available to seagrasses

Below: Rubbish in a seagrass meadow  
Right: Discarded fuel drum



Effects from boating activity  
clockwise from above: A recent propellor scar; an old propellor scar with seagrass recovering; sediment stirred up from boat movements; mooring scars.



Digging for worm (bait) by fishers. Above left: aerial view showing density of scars. Above right: A recent dig showing the extent of damage



Damage to reef platform meadow from heavy machinery on a remote Torres Strait Is.



# Protecting Seagrass

All seagrasses and other marine plants are specifically protected under the Fisheries Act 1994 in Queensland waters, as the proper management and conservation of these habitats is essential to both the commercial and recreational fishing industries and to traditional fishing activities. The majority of the seagrass meadows in coastal Queensland are also within areas closed to trawling to avoid capture of juvenile prawns.

Any damage or removal of seagrass requires approval from DPI&F under the Integrated Planning Act 1997 or authorisation for minor disturbance (e.g. for research) under a self-assessable code.

Where development along the Queensland coastline directly impacts on seagrass habitats, (e.g., marinas, port developments, etc.) DPI&F must undertake a thorough assessment of the proposed development based on Departmental policies and taking into account the merits of the individual proposal prior to any approval being issued. Applications may be refused. Whenever an approval is issued involving losses of seagrass or any marine plants, offsets for this loss must be provided by the developer with agreement by DPI&F where appropriate.

Whilst DPI&F issue approvals for development that can impact directly on seagrass meadows it is harder to control offsite factors that can affect seagrass, things such as reduced water quality,

sediments and nutrient loads. Wherever possible DPI&F recommends buffers between development and freshwater and tidal wetlands to improve water quality further downstream.

An additional level of protection that DPI&F provides for seagrass and fish habitat is via the State's declared Fish Habitat Area (FHA) network. The FHA network throughout Queensland consists of 71 tidal wetland areas that have an extra layer of legislative protection which restricts the type of disturbance or development, providing a higher level of protection for seagrass and all other fish habitats within the area. Before an area is considered suitable for FHA declaration, it must be first assessed against standards for each of the following criteria: fisheries (e.g., fish species richness), habitat (e.g., size and diversity of habitats) and unique features. In 2005/2006, Seagrass-Watch supported an assessment of the fisheries resources (fish & habitats) of Albatross Bay (Weipa & Napranum) to determine if it met the requirements of FHA with the view of possible future declaration. Although the area meets the criteria of an "A" management FHA, a decision is still pending after closer consultation with stakeholders. The declared FHA network currently protects more than 800 000 ha of Queensland's coastal fish habitats. 🌱



Coastal development:  
Left: marina and reclamation  
Below R: port expansion (e.g., Brisbane Port)  
Below L: beach replenishment

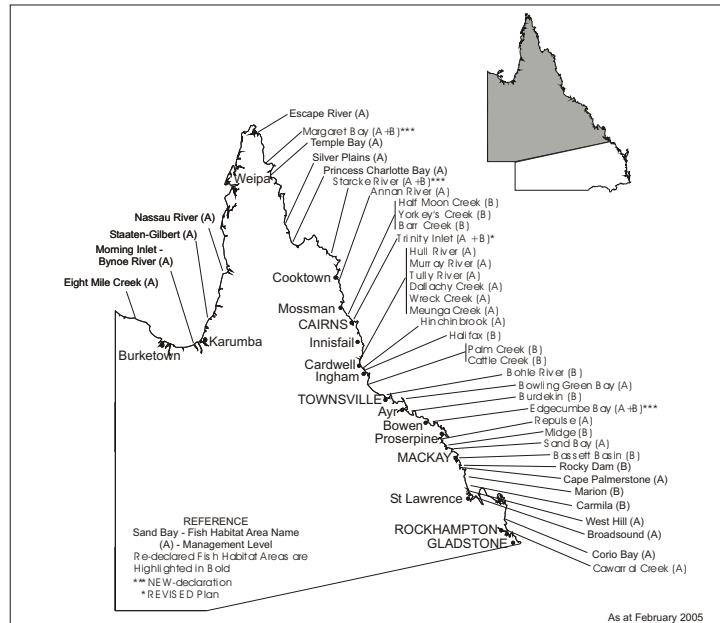


## YOU CAN HELP

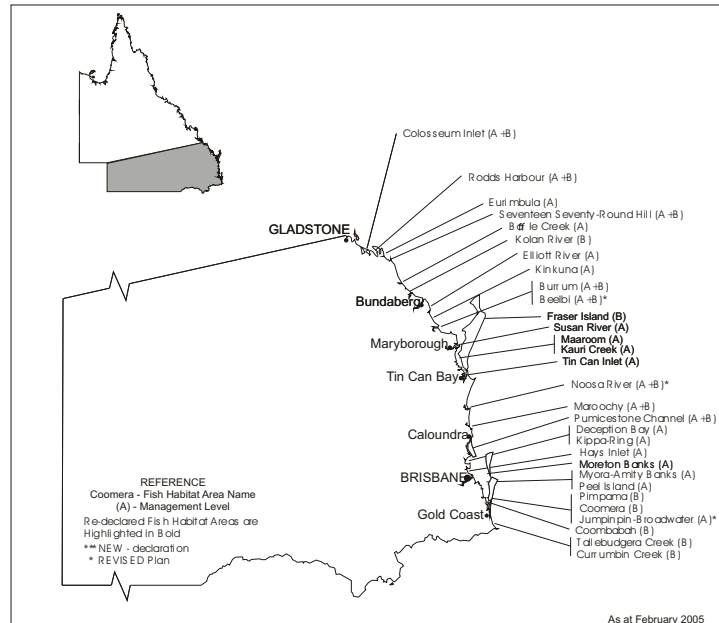
There are strong links between Seagrass-Watch monitoring sites and the Fish Habitat Management Group at DPI&F. Any unusual monitoring results provided by the SGW groups within Queensland are passed onto the DPI&F Fish Habitat Management group for investigation and management response.

To report any suspected illegal activities involving damage to marine plants or fisheries, phone the 24-hour freecall Fishwatch Hotline on 1800 017 116.

For more information on seagrasses and other marine plants or any departmental policies discussed, contact DPI&F on 132523 or check our website at [www.dpi.qld.gov.au/fishweb](http://www.dpi.qld.gov.au/fishweb).



Fish Habitat Areas in Queensland: Gladstone to NT Border



Fish Habitat Areas in Queensland: NSW Border to Gladstone



# Torres Strait - Queensland



## Torres Strait Round-up May 2007

Monitoring this month saw us monitoring all our regular sites with a return visit to Hammond Island.



The trip kicked off with monitoring Hammond Island first (see Stephan Ambar's recount) after we held a small presentation ceremony so that participants of the February Training Workshop could receive their certificates.

HI1, Wongai Beach, Horn Island was the next site to be monitored. Unfortunately the Kaiwalagal rangers were unable to monitor

this trip due to conflicting engagements. Not to worry we got a team together including regulars: Beccie Bowie, Stacey Ketchell, Sinitta Cloudy and new recruit Caitlin Seton. We missed our regular photographer Kinam Salee as she was away on a Rugby trip down south, but Sinitta managed the camera admirably.

The following day we monitored Back Beach (TI1) after a series of talks had been delivered to the Yr 11 Marine Studies class and the Yr 12 Multi-strand Class. Kinam, fresh (?) from her Rugby tour, took up the duties of photographer once again. It was a busy afternoon with people coming and going according to their other commitments. Three new students (Nancye, Sally and Zara) received on-the-spot training, and Joseph undertook refresher training (August 2006).



Above: Beccie supervises Caitlin's seeding monitoring technique  
Left: Stacey Ketchell, Sinitta Cloudy and Caitlin Seton on less muddier grounds, Horn Island



Jane shows Zara, Sally and Nancye the ropes

The team were ably supported by teacher aides Sue and Geoff.

An interesting incident did occur highlighting the necessity of watching where you put your feet, and wearing appropriate footwear. Geoff had a slight run in with a mud crab, luckily for him he was wearing booties and the crab came off second best. Something else that occurred that afternoon that we have talked about but never really seen, is the proximity of quite large vessels



that travel along side the meadow. This observation brought home the vulnerability of TI's seagrass meadows to potential boating/shipping impacts and made us realise the importance of our continued monitoring on the health of this meadow.

Quite a team assembled for Front Beach (TI2), regulars Kinam, Stacey, Sinitta, Caitlin and Sue. They were joined by Sally and Nancye who had only



Some perspective on the crab that got away



Back Beach Team finishes for the day



Sue, Seagrass-Watch regular on Thursday Island (standing) puts Sally and Charlie through their paces

tried out Seagrass-Watching for the first time the day before. Undaunted by the experience they came along to TI2 for a second dose. Charlie overcome by curiosity eventually ventured out from the beach to be part of the action. All in all it was a pleasant afternoon and with that many people monitoring was quick!

Next sampling is early August and we revert back to early morning (6:00am) sampling - at least we get to experience the sunrises. 🌱



Above: Steve Ambar presents certificates to Joyce, Elizabeth and Anima on Hammond Island.

Right: The Front Beach team





# Torres Strait & North Queensland



## Hammond Island

Stephen Ambar reports



Hello fellow seagrass monitors! My name is Stephen Ambar. I live on Hammond Island, and work as a Hammond Island Community Ranger. I would first like to acknowledge the traditional owners of Hammond Island. The Island is located in the Kkaiwalagal group of islands in the Torres Strait.

### Seagrass & our livelihood

We all feel that seagrass monitoring will allow us to find any changes in the growth and distribution of our seagrass meadows. We could react quickly in reporting to the appropriate authorities. If there are severe changes, it could affect our traditional food and way of life. Dugong and turtle need these little seagrasses to keep on living.

### Monitoring our Sites

On the 8th May 2007, the Nursery ladies were relaxing at the Community Council Office waiting for Jane Mellors (SW HQ) arrival, They told me they were hyped up and ready to go. We departed the council office around 1:30pm in two Toyota dual cabs. The tide was perfect - you couldn't ask for a better day to do Seagrass-Watch. We arrived at the HD1 site, Francis was off and the group followed behind. The group broke up into three teams to start monitoring: transect one - Francis Dorante & Jimmy (who also took the quadrat photos); transect two - Judith Thaiday, Alice Garnier, Salu Dorante & Elizabeth Dorante; transect three - myself, Joyce Cowley, & Anima Pearson. Jane checked with each group and supervised their monitoring



Judith, Salu, Elizabeth and Alice on Transect 2



Anima and Joyce assist Stephen on Transect 3

Unfortunately, Brancis Baira had to walk back to the beach area to rest her legs, with Aunty Joyce accompanying her. The meadows can be a challenging walk for some. It was great to see Judith and Alice participating with the group. They didn't have the correct footwear last time.

Anyway, transect two was going very well, then all of a sudden Aunty Salu stepped on a large mangrove crab. Francis tried to catch the crab but it was too fast. The big blue nipper mud crab went into his beautiful habitat. The seagrass meadows that form his habitat on Hammond Island consist of *Thalassia hemprichii*, *Enhalus acoroides* and *Cymodocea rotundata*.

Our aim is to have two more sites that we can monitor in future. These would be located on the NN West and Southern side of Hammond Island. 🌱



## Yule Point

Tom Collis (Tropical North Queensland TAFE) reports

Kaiwalgal and Hammond Is rangers from Torres Strait attended a residential at Tropical North Queensland TAFE in Cairns recently for Certificate II Conservation and Land Management. As part of their studies they joined up with Cairns students studying the same course and undertook monitoring of seagrass at Yule Point on Thursday, 31<sup>st</sup> May. The marine rangers usually monitor seagrass sites in the Torres Strait, so this was an opportunity to see a different site with some new faces.



Katua Rattler and David Charlie looking for seagrass seeds



Future Mpatiwa (Zimbabwe) and Pearson Wigness (Torres Strait)

The first thing they noticed was the fine hard sand at Yule Point, so no muddy feet!! As they walked out to the site we were greeted by thousands of soldier crabs as well as numerous seastars. The marine rangers noticed dugong tracks in the seagrass meadows, observing that the tracks were probably a week old. It was quite a windy day so there were lots of laughs as we laid out the measuring tapes in the strong wind.



Anna De Bruyne and Mary Ann Miskin

The Torres Strait rangers enjoyed sharing lots of stories about the sea country with the Cairns students, especially a Zimbabwean student in the group who has only recently seen the sea. 🌱





# Singapore

## Singapore Round Up

Ria Tan Singapore Seagrass-Watch local coordinator reports



Baffled by seagrass IDs? Wondering what's the deal with the transect lines and quadrats? Puzzled by why we measure the things we measure? All these and more were made clear when Len McKenzie and Rudi

Yoshida from Seagrass-Watch HQ gave TeamSeagrass a special workshop on the 24<sup>th</sup> March 2007. In a classroom session held at NParks BioDiversity's fabulous briefing room, we learned everything we wanted to

know but were afraid to ask.

The workshop also gave us a deeper appreciation of the importance of seagrasses and the many threats to this special ecosystem throughout the world. We are truly fortunate to have good stretches of this threatened ecosystem on our very own shores. And glad to be making a difference for them. Siti also gave a presentation on what we've been up to, and shared some preliminary findings from all your hard work in data collection.



Len (SW HQ) and Siti (Team Seagrass) talk to the media



Choo Chee Kuang and Dr Chua Ee Kiam

Attendee Seagrassers had lots of fun immediately putting the new knowledge into practice. Checking out the live seagrasses which were set up in a tank, specially for the workshop. While Len was hard at work giving the workshop, others were busy sharing the TeamSeagrass story with the media. Yes, we decided to go public with TeamSeagrass! And what better occasion than during



Arriving at Cyrene Reef.



Ria takes charge with the camera

Len and Rudi's visit to Singapore! Other special guests for the workshop were Choo Chee Kuang and Dr Chua Ee Kiam. Choo is Seagrass-Watch local coordinator at Pulau just opposite our Tuas (Singapore) monitoring site, and also champions the Save our Seahorses campaign in Malaysia. It was such a treat to have him with us to share his vast experience about seahorses, seagrasses and shore stuff. Dr Chua is of course Singapore's renowned nature photographer and author. He shared his latest book about Singapore's shores with the media too!



Dense *Enhalus acoroides* at Cyrene reef

Earlier that morning, TeamSeagrass were out at Cyrene Reef to show this fantastic reef to Len, Rudi and Choo, and to discuss setting up a monitoring site on the reef.

Bright and early the very next morning, the 25<sup>th</sup> March, TeamSeagrass were out on Pulau Semakau with Len and Rudi for the field portion of the workshop and to do some monitoring. On arrival, TeamSeagrass guide Ron Yeo gave an impromptu introduction to the Landfill and the intertidal wonders of Pulau Semakau. We took the traditional Team photo just before bashing through the mosquito-infested trail of the forested portion of Pulau Semakau



Right: Rainforest trek to the sites at Semakau  
Below: Semakau's lush seagrass meadows.



to reach the shore.

Reaching Semakau's vast seagrass meadows, Len held the Team enthralled as he explained the finer elements of monitoring.



### Pulau Semakau

Pulau Semakau is located to the south of the main island of Singapore, off the Straits of Singapore. The current island was formed by the amalgamation of the then much smaller Pulau Semakau and Pulau Sakeng. Pulau Semakau was Singapore's first offshore landfill. It covers a total area of 3.5 square kilometres and has a capacity of 63 million m<sup>3</sup>.

Semakau Landfill is filled mainly with inert ash produced by Singapore's four incineration plants, which incinerate the country's waste, shipped there in a covered barge (prevents the ash from being blown into the air) every night. Contrary to popular belief that Semakau would be another dirty and smelly landfill, the care put into the design and operational work has ensured that the site is clean, free of smell and scenic.

Semakau has vast meadows of *Enhalus acoroides* (considered rare and vulnerable in Singapore), mixed with *Halophila ovalis*, *Cymodocea serrulata* and *Halodule* sp.







Len (SW HQ) with workshop participants on Semakau

Under Len's guidance, one team started off on the first transect. Then everyone headed off to the transects, to put into practice what we've learnt. Meanwhile, Nigel Goh (NP Senior Officer) brought the media to have a look at the coral reef edge. The amazing reef animals do Pulau Semakau proud!

TeamSeagrass was all ready for monitoring early on the morning of Sunday April 8<sup>th</sup>. After the traditional 'TeamSeagrass Pose', Shufen and Wei Ling explained the special 'random' method that we would employ on Sentosa. The team got ready to do their thing, but the tide was still high! And it stayed high! The previous day, Shufen and Wei Ling also experienced an unusually higher tide at Labrador and Ron Yeo (TeamSeagrass-Semakau) said the guides at Pulau Semakau also felt the tide was unusually high.

We are perplexed. What could have caused this? Glaciers melting? Effect of the recent tsunamis? Bad algorithms for predictions in the tide tables? We haven't a clue. (It certainly wasn't us reading the tide tables wrongly :-)) We triple checked that as soon as we got back). Usually, the area that we monitor would have been well exposed for at least two hours, but this was not the case for the entire three hours that we were there!! However TeamSeagrass is never put off even by nature-defying situations. We simply went straight to the next item on the agenda: exploring the shore.

Another dawn arrival on Cyrene Reef (21 Apr 07) by the intrepid Team on this submerged reef near Singapore's container terminal. The city skyline was hazy in the distance as rain fell from an angry pile of big clouds sparkling with lightning. We were SO glad it didn't head our way.



It was a lean team that landed on Cyrene for the first TeamSeagrass monitoring of this very grassy reef. We quickly headed out to our site (Cr1) and to set up transect 1. Andy was obviously very ready to whack

something with the Team Mallet. Fortunately, the ladies quickly figured out where to place the markers so Andy could vent onto the stake. (The Mallet intriguingly had a label that said it was useful for 'removing ordinary nails'--we couldn't figure out how that would be possible).

Then it was time to set up Transect 2. "Follow me!" Siti says...and she promptly headed off, literally into the horizon. The rest of us trudged on behind her, past vistas of amazing marine life, sand flats and pools thick with seagrasses. "Are we THERE yet?" we complain loudly...alas, it was a looong walk before we did get there.

Cyrene is quite challenging to monitor because it has so many different seagrasses, which unfortunately, look similar. To identify the species, requires close examination and much squinting at leaf veins and such. As this diligent team at Transect 1 was still doing long after the rest of us were done.



Soon, we were done monitoring and spent the rest of the low tide checking out the reef. Besides the enormous expanse of seagrasses, there are also vast stretches of coral rubble and reef flats. All right next to major shipping lanes.

The seagrasses are full of life! We spotted a baby Knobbly sea star. Like a cartoon version of the bigger adult star, it was so cute and small! At Transect 2, the seagrasses were crawling with white sea urchins, some gathered together in big piles. It was hard to walk without stepping on them. These urchins also 'carry' things such as shells, bits of debris. There were several carpet anemones and most had a pair of anemone shrimps. On the sandy area, I startled a little soldier crab that waved its elongated pincers at me as it back pedaled into the wet sand and promptly disappeared from view.

All too soon, we had to leave as the tide rushed back in. We had a little bit of an adventure clambering back up the boat as it moved up and down in the surge. Then the boat got stuck and the manly team members had to push it off the reef. Fortunately, we all got back more or less in one piece. What a great trip! And it would not have been possible without team members Andy, Annabelle, Chay Hoon, Dionne, Kevin, Marcus and Vyna. Thank you! Dr Chua Ee Kiam also joined us for this trip.

On the 22<sup>nd</sup> April, TeamSeagrass was back on the shores of Chek Jawa for an early tide. While the busy Seagrassers headed off to the seagrass lagoon to monitor, I decided to check out the coral rubble area to see how things were since the mass deaths at Chek Jawa, that we encountered earlier in the year. The seagrasses were certainly doing very well in the area. With lots of *Halophila spinulosa*, as well as thickets of other seagrasses like *Halophila ovalis* and *Halodule sp.*



### Cyrene Reef

Located to the south of mainland Singapore, Cyrene is comprised of 3 patch reefs- Terumbu Pandan, Pandan Beacon and South Cyrene Beacon, it is one of the largest patch reef systems in Singapore. Cyrene Reef is a key maritime crossroad where east-west traffic routes cross north-south routes. Approximately five hundred ships transit the waters around the reef every day. The reef is also next to massive industrial sites like Jurong Island and Pulau Bukom, and opposite Singapore's container terminals. With abundant seagrass meadows and other marine life, Cyrene is a natural wonder. The reef top meadow is a mixture of *Enhalus acoroides*, *Cymodocea serrulata*, *Cymodocea rotundata*, *Halodule uninervis*, *Halophila ovalis* and *Syringodium isoetifolium*.





# Philippines

## Bolinao, Philippines - Seagrass Demonstration Site UNEP/GEF South China Sea Project

In April, a Seagrass-Watch training workshop was hosted by the Bolinao Seagrass Demonstration Site project at the University of the Philippines' Bolinao Marine Laboratory with the assistance of Len McKenzie (Seagrass-Watch HQ). Approximately 30 local participants attended.



Tutu (Demonstration Site Manager) introduces Len (SW HQ)



Participants board the bangka for the trip to the Seagrass-Watch site on the northern side of Santiago Island



Over the two days, participants learnt seagrass taxonomy, seagrass ecology, why seagrasses are important, how seagrass can be impacted and how to map and monitor seagrasses. As it was Easter, participants used their newly learnt skills with a GPS to hunt for Easter eggs at saved waypoints during one of the field activities.

On day two of the workshop, participants established a Seagrass-Watch site which they monitored and mapped.

The workshop gave the participants a thorough understanding of seagrass ecosystems, improved their capacity to monitor their seagrass resources, and empowered them to take ownership of their local marine resources and take a role in initiatives to protect, conserve and maintain the resources.

The Bolinao Seagrass Demonstration Site project recognises the ecological and economic roles of seagrasses in Bolinao, and that the maintenance of their ecology and integrity will, in both the long and short term contribute to uplifting the lives of the citizens of the municipality. It also recognises that sustained efforts in this direction should

involve local participation and initiatives.

The project aims to establish functional linkages between and among community groups, academic institutions, with local and national government support, so that the seagrass ecosystems that form the resource base of local livelihoods will be enhanced, protected and managed. In addition, it will preserve the biodiversity in the seagrass meadows, marine fauna and flora alike, restore the degraded areas, and reduced threats and provide preventive actions to these threats.

There is a real need to take initiatives to protect, conserve and maintain the resources.

Seagrass meadows play a very important role in the community since many of their livelihoods rely heavily on the seagrass meadows. At present, most people in the community understand this, but the importance of the linkages between seagrass meadows and other two major components of the marine ecosystem (mangroves and coral reefs), is not seriously considered.

Experience from other community-based initiatives shows that self-management of local resources is sustainable and effective if user-communities take on ownership of management activities.

The objectives of the project are:

- To enhance resource management, particularly for seagrasses based on comprehensive data and information;
  - To intensify and increase public awareness through information, education and communication campaign;
  - To strengthen stakeholders' capacity in management of resources; and
  - To design and implement alternative/supplemental livelihood program.
- With the implementation of the seagrass demonstration site in Bolinao, the following management outcomes are expected:
- A functional linkage among stakeholders;
  - Increased public awareness;
  - Strengthened capacity building among stakeholders;
  - Improved legislation and enforcement practices from project recommendations
  - Community establishment of protected sites;
  - Sustained monitoring through Seagrass-Watch;
  - Improved seagrass cover and maintenance of biodiversity;
  - Developed and improved livelihood skills of coastal communities to protect and manage seagrass and related reef resources.

For more information, please contact Demonstration Site Manager Ms. Tutu B. Almonte, [tutualmonte@yahoo.com](mailto:tutualmonte@yahoo.com)



Participants map the boundaries of seagrass patches at the monitoring site, Binabalian Labas.





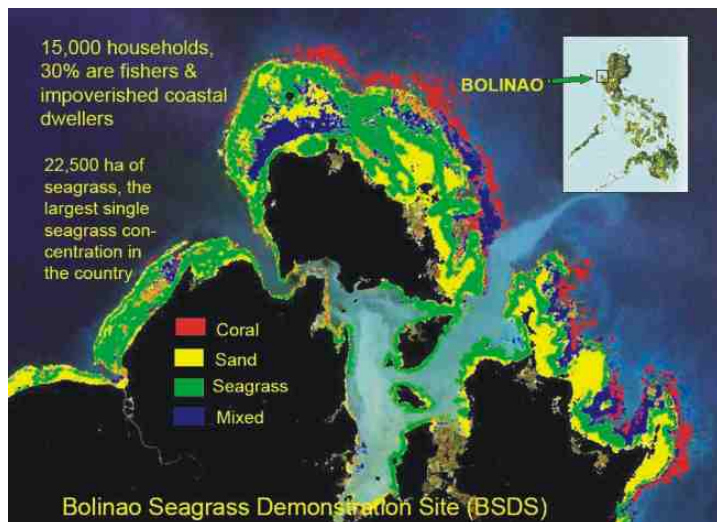
# Singapore & Philippines

## Seagrasses of the Philippines

Seagrasses are a prominent component of Philippine coastal ecosystems, where they sustain high primary production and provide habitat and food for economically important species. The seagrasses of the Philippines are also important food for marine green turtles and dugongs.

The seagrass flora of Philippines is characterized by a high species richness and mixed meadows are common. There are 13 seagrass species found in the country, *Cymodocea rotundata*, *Cymodocea serrulata*, *Enhalus acoroides*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila beccarii*, *Halophila decipiens*, *Halophila minor/ovata*, *Halophila ovalis*, *Halophila spinulosa*, *Syringodium isoetifolium*, *Thalassodendron ciliatum* and *Thalassia hemprichii*.

There is some confusion regarding the distribution of seagrass in the Philippines. Some estimate only 33 km<sup>2</sup> of seagrass in the Philippines, however others using several methods, including remote sensing, estimate approximately 975 km<sup>2</sup>. Nevertheless, mapping of seagrass distribution is limited and ad-hoc.



Satellite image showing seagrass, coral and mixed benthos at Cape Bolinao. Courtesy M. Fortes

In the Philippines, *Enhalus* is one of the most prominent seagrass species in mixed seagrass meadows. In the reef flats off Cape Bolinao, this species is able to colonize various habitat types: muddy to coarse sandy substratum, turbid to clear waters and splash zones above zero datum to ca. 3m depth. Across this range in environmental conditions, *Enhalus* shoots differ in morphology, biomass and density. Flowering occurs year-round, but the intensity varies temporally and correlates with mean

water temperature. Spatially, differences in flowering intensity correlated with available light as affected by turbidity and water depth. Contrary to most seagrass species, *E. acoroides* invests substantial resources in reproduction, allocating up to 20% of its aboveground production to flowering and fruiting. Similar to other tropical seagrasses, *Enhalus acoroides* in Cape Bolinao are limited by the availability of nitrogen, which is highly variability both in space and time.



The other prominent seagrass species in Bolinao is *Thalassia hemprichii*. However, no persistent seed bank has been reported to be the present.



Seagrass meadows in Bolinao and the Philippines are of significant importance to artisanal fisheries. The seagrass meadows of Cape Bolinao form the base of fishery resources for 35 barangays (Philippine political units). One of the most important fishes includes the rabbitfish. Seagrass landscape patterns have been shown to influence fish abundance in Bolinao, but only in terms of continuity of vegetation.

The seagrass meadows of Bolinao are seriously threatened through the direct and indirect effects of human settlement and coastal development leading to intense pressure and anthropogenic disturbances. One of the most significant threats to seagrasses in SE Asia and the Philippines includes increased siltation from deforestation. Philippine seagrass species richness and community leaf biomass decline sharply when the silt and clay content of the sediment exceeds 15%.

It is hoped that through initiatives such as the UNEP/GEF South China Sea Project, the establishment of a Seagrass Demonstration Site in Bolinao will build the capacity of local stakeholders take a role in the conservation of their seagrass resources.♥



### Rabbitfish and seagrass

Rabbitfish are a valuable seafood resource for subsistence fishers in the Philippines. They belong to the herbivorous Siganid family, and rely on seagrass for their food, as well as habitat for juveniles. Reduction in seagrass coverage in the region will have a negative impact on rabbitfish stocks, and hence on food security of coastal subsistence communities in the Philippines.



### Oatmeal cookies from Seagrass seed flour.

The seeds of *Enhalus acoroides* are known to the Philippine coastal people to be edible. Its approximate nutritional composition is similar to that of rice. It is eaten raw or boiled and tastes like sweet potato when cooked. Some fishermen believe that it is an aphrodisiac. With the aim of developing seagrass seed as human food in small islands, researchers from the

University of the Philippines have developed a flour made from dried mature seeds of *E. acoroides*. Using a standard recipe for oatmeal cookies, seagrass seed cookies were made using seagrass flour half substituted for half of the usual wheat flour. Responses to a taste test were very positive and further development is planned. Additional investigations will include the nutritional evaluation of seagrass plant parts to support the protection of the ecosystem.





# Asia and the Pacific

## Pramuka Island, Seribu Islands, Indonesia

M. Alief Farid (University of Indonesia) reports



In May 2006, I examined the condition of seagrass communities at Pramuka Island, Seribu Islands, Jakarta, Indonesia.

Together with the British International School (BIS) Jakarta students (Year 12), Ligula Ecotourism, and Elang Ekowisata, we conducted seagrass monitoring during their field trip in the morning after breakfast.

The teams separated into three groups, each of them observed a transect. Before we went to the site, each of team was taught the Seagrass-Watch methods so they knew how to take the data.



Seagrass-Watch conducted on Pramuka Island, Jakarta

Unfortunately, the wind on the site blew quite fast so laying the measuring tapes was a challenge.

My group only found two species on our transect: *Thalassia hemprichii* and *Enhalus acoroides*. Since their coverage was poor, we completed our transect fast. Another team found *Cymodocea rotundata* and *Thalassia hemprichii*. I have found 6 species snorkelling around the island. The other species included *Syringodium isoetifolium*, *Halodule uninervis* and *Halophila ovalis*.




Fadzai, Chika, Adrio and Emma estimate seagrass cover

Also on Pramuka island is a mangrove planting site established in the seagrass area. The planting site has continued to grow through the seagrass meadows and we want to know if the mangroves are having an effect on the seagrass. I hope we can established a permanent site and continue monitoring the area.



Nicole holding the quadrat while Jacqueline, Queenie, Arvi, and Harrisman estimate species

Thanks for all participants and Seagrass-Watch HQ for teaching me about Seagrass-Watch in Bali 2005. Nge'lamun' Yuk!! (inviting jargon in Bahasa for doing Seagrass-Watch).

### Seribu Islands

Pramuka Island is the regency seat of the Seribu Islands (a chain of 105 islands stretching 45 km north into the Java Sea, with the closest lying in Jakarta Bay only a few km off mainland Jakarta). The area is noted for its abundance of attractive beaches and coral reefs. In 1995, the islands were declared a marine national park. Tourism has grown rapidly from one operator on a single island in 1982 to 11 operators working out of 18 islands in 1992. There were approximately 8,000 visitors in 1991. Some islands have long been inhabited by villagers who depend on reef and island resources. However, the tourism industry employs less than 5 percent of the local population. Domestic sewage, industrial effluent, and urban runoff from Jakarta threaten the southernmost portion of this area. Floating garbage is a problem, depending on prevailing winds. Ballast water discharges from boats result in tar being washed up on local beaches. Blast fishing, although outlawed nationally since 1920, still occurs as well as heavy ornamental fish collecting and major subsistence exploitation of marine resources. The islands are under pressure from developers seeking more tourism and recreational facilities to service greater Jakarta. Oil and gas exploration, taking place within kilometers of the park, could pose a potential future threat. Source: 1998. Reefs at Risk: A map-based indicator of potential threats to the world's coral reefs. Dirk Bryant, Lauretta Burke, John McManus, and Mark Spalding.



## Motupore Is Marine Biodiversity Unit Seagrass-Watch monitoring



Jane Wai reports

We have completed the second of our quarterly monitoring surveys for this year. There have been recent events of very low spring tides that have caused approximately 50-60% of the seagrass meadows within the intertidal zone to become overexposed and wither away. However, these should recover in time.



BT1205


The two sites that we monitor vary considerably in their sediment composition and exposure to the wind and thus have slight variation in species composition. The first site which is BT1 has sediment which is mostly sand, shell and to a lesser extent, silt. The second site, BT2 has sediment composition which is mostly gravel, shell and sand with very little silt. The dominant species in site BT1 is *Cymodocea rotundata*, followed by *Thalassia hemprichii* in close succession along with the other species which constitute a much smaller percentage. Site BT2 is dominated by *Thalassia hemprichii*, followed by *Cymodocea rotundata*, *Syringodium isoetifolium* and *Enhalus acoroides*, although not necessarily in that order.



Eddie laying out the transect at BT1



BT2305

We have received favourable initial responses from the local communities approached to establish new seagrass monitoring sites but have yet to formally meet with them to select the exact locations. We will continue to work on this and intend setting up the monitoring sites and conducting the first of the surveys before the end of the year. 



Jane and Geua at BT2





# Eritrea

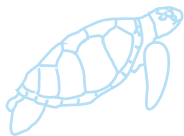
## Stomach analysis of a Southern Red Sea Green Turtle

Yosief Hiabu Berhane and Woldu Habtemariam (MFCIMD, Massawa, Eritrea) report.

The stomach content of a female green turtle (*Chelonia mydas*) slaughtered by local residents of Kiloma was analysed on 15<sup>th</sup> October 2005. The stomach content was sorted and identified eight hours after the turtle's plastron was opened. The estimated weight of the turtle was 90kg. Curved carapace length and curved carapace width was 130cm and 90cm respectively. Intestine length was 23m with an average cross section diameter of 7 cm.



The turtle slaughter in progress  
(Photo by: Yosief Hiabu)



Kiloma is a coastal village about 50 km south of Assab, southern Eritrean Red Sea. In the surrounding islands, there are six seagrass species (*Thalassia hemprichii*, *Halophila ovalis*, *Enhalus acoroides*, *Cymodocea rotundata*, *Halodule uninervis* and *Thalassodendron ciliatum*) and seven genera of macroalgae (*Cystoceira*, *Halimeda*, *Caulerpa*, *Sargassum*, *Grassilaria*, *Chaetomorpha* and *Turbinaria*). The turtle's stomach however, exclusively consisted of two seagrass (*Cymodocea rotundata* and *Thalassia hemprichii*), and one species of seaweed (*Sargassum illicifolium*). Of the total wet weight, the dominant food item was *S. illicifolium* (47.4 %), followed by *T. hemprichii* and *C. rotundata* (38.2% and 14.3% respectively).

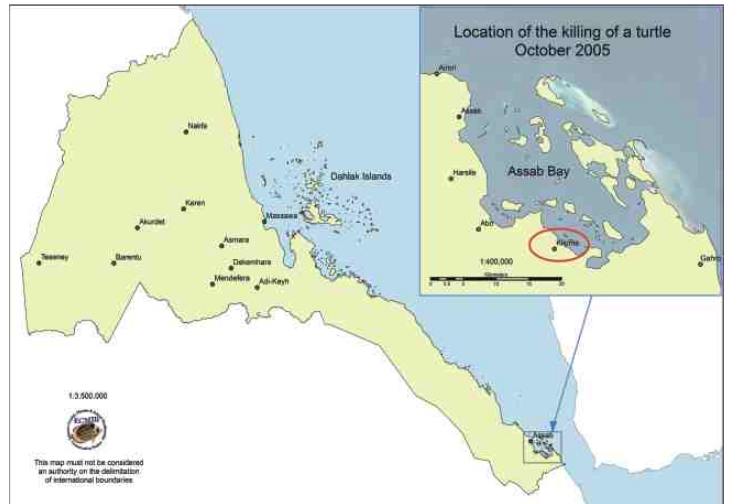


The stomach of the female green turtle  
(photo by: Yosief Hiabu)

The stomach content before separation  
(photo by: Yosief Hiabu)



Two seagrass and one macroalgae when separated  
(photo by: Yosief Hiabu)



Map of Eritrea and the coastal village of Kiloma.

A rapid assessment of seagrass and macro-algae distribution in the islands within 4 to 15km from Kiloma was conducted to investigate turtle food selectivity (i.e. if the turtle was targeting food items, or feeding on the dominant food item).

Results of rapid assessment of seagrass and macro-algae in the islands nearby Kiloma (12° 51' 57.9"N and 42° 52' 39.5"E)  
+ shows availability, +(a) abundant, and +(d) dominant

Seagrass / Macro-algae	Bolita	Abugendela	Umelgas	Adaile
	12° 49' 38.6"N 42° 52' 47.1"E	12° 52' 15.1"N 42° 50' 45.0"E	12° 52' 11.9"E 42° 51' 19.8"E	12° 51' 57.9"N 42° 52' 35.9"E
<i>H. ovalis</i>	+	+		+
<i>H. stipulacea</i>				
<i>T. hemprichii</i>	+	+		+(a)
<i>E. acoroides</i>		+(d)	+(a)	
<i>H. uninervis</i>	+	+		
<i>S. isoetifolium</i>				
<i>C. rotundata</i>	+(d)	+		+(d)
<i>T. ciliatum</i>				+
<i>Cystoceira</i> spp.	+	+	+	
<i>Halimeda</i> spp.	+			
<i>Caulerpa</i> spp.	+			+
<i>Sargassum</i> spp.		+		+
<i>Grassilaria</i> spp.		+	+(d)	+
<i>Chaetomorpha</i> spp				+
<i>Turbinaria</i> spp				+

The comparison of the stomach content with the availability of seagrass/macroalgae cover in the nearby islands leads to the conclusion that green turtle are important marine grazers that are highly specific in selecting among different food types. This shows that individual green turtles spend a considerable time grazing on one seagrass/seaweed ground before shifting into another. Further studies are needed to investigate the feeding habits of sea turtles on seagrass meadows as they prove to be among the major seagrass grazers. 🌱

Right: *Enhalus acoroides*, *Thalassia hemprichii*, *Cymodocea rotundata* with *Sargassum* sp. on reef flat platform

Below right: *Cymodocea rotundata* meadow  
Below left: *Thalassia hemprichii* meadow







## Seagrass-Watch Champion

### A profile of Margaret Parr

Margaret Parr is Seagrass-Watch's longest serving local coordinator and longest continuous participating volunteer. So it is with great sadness that we report Margaret is leaving our northern coasts and heading south. But before we could let her go, we took the chance to ask her a little about her experiences in the Whitsunday's and Seagrass-Watch.

### How long have you lived in the Whitsunday's?

We moved from Mackay to the Whitsundays in 1998. Originally from Scotland, so I had very limited knowledge or experience of things in the sea - the abundance and diversity of accessible 'marine life' here still amazes me.

### How did you become involved in Seagrass-Watch?

When I joined Whitsunday Volunteers they had just decided to become involved in Seagrass-Watch. I thought it an interesting project and volunteered to be involved and to help my daughter, Amanda who had volunteered to coordinate a group of Volunteers to monitor Pioneer Bay. After a few months she moved away and I carried on! But I took it on very willingly, it was a huge learning curve.

### What have you enjoyed by your involvement?

I have enjoyed it for four reasons

1. Being involved in a worthwhile project where data collected is valued and used.
2. Learning so much and hopefully contributing in managing our local environment.
3. Working with wonderful folks like the local mob, Jane Mellors and her various helpers - always have a few laughs and usually a cuppa and chat.
4. Getting out on the different sites. With exception of mud in Pioneer Bay, they are all beautiful meadows in beautiful surroundings.

### Any particular fond memories?

The forum in Hervey Bay [2001] was a highlight. Lots of others - like seeing my first dugong feeding trail, collecting dugong poo and the day we were reported to Officers of Boating & Fisheries Patrol who came out to see what we were up to!

### What was your worst memory?

The first time I saw Pioneer Bay meadows swamped in mud from a nearby development.

Right: Margaret accurately estimates the seagrass cover  
 Below right: A deeply concerned Margaret shows Warren Lee Long the algal bloom  
 Below: Margaret and team accept Prime Ministers Environment Award



### What is your impression of seagrasses in the region?

Don't know what to answer here! My very unscientific answer would be that meadows are usually visually stunning here and seagrasses are so resilient.

### What is planned for the future?

Bruce and I are heading south Canberra initially where Amanda works in fisheries management then who knows, but intend to return to living by the sea!

We wish Margaret and Bruce all the best on their travels. They will be greatly missed by us all.



## Roebuck Bay: low levels of seagrass

Danielle Bain reports

The Roebuck Bay community seagrass monitoring project has been successfully running now for two months. About 20 volunteers have signed up for the monitoring project, which is a fantastic response from the Broome community. Volunteers have recorded information about the seagrass at three sites in Roebuck Bay and have found very low levels of seagrass. We have recorded between 1 and 3% cover for all three sites but most of the time we have recorded less than 1%.

We are hoping this is just a normal phase of growth for this time of year and we are expecting seagrass cover to increase again around September or October.

These findings demonstrate why it is so important that we collect baseline information on the seagrass beds in Roebuck Bay. At this stage we are not able to draw conclusions about whether the low levels of seagrass are normal for these areas of Roebuck Bay at this time of year as it is the first year of data collection. 🌱



## Seagrass-Watch Training workshop

**1-2 September 2007**

Sponsored by Environs Kimberley, Kimberley Land Council & Seagrass-Watch HQ

To register, contact Danielle Bain [dans\\_al@westnet.com.au](mailto:dans_al@westnet.com.au) or [hq@seagrasswatch.org](mailto:hq@seagrasswatch.org)