

Seagrass-Watch

news



Issue 31 • December 2007

Seagrass-Watch has had another successful year, which concluded with many participants being awarded by their local communities for their efforts.

It's not only been a good year for participants, seagrass also appears to have fared well. Across Queensland, many groups are reporting seagrasses to be more abundant in 2007 than in 2006, with one exception.

Seagrass-Watch HQ has been busy in the field with RWQPP monitoring and catching up with participants in the far north (Torres Strait), west (Mornington Island), east (Townsville, Whitsundays), and the south of Queensland (Moreton Bay, Gold Coast).

In this issue you'll find articles on recent training workshops and about establishing Seagrass-Watch in central Viet Nam. Read about developments in Noosa and get an update from Moreton Bay. Hear from a couple of the schools as part of Seagrass-Watch's education initiative and learn about polychaete worms and researching the diets of turtles.

Finally, a special mention of the Great Sandy Strait local heroes who, with only 6 members, have conducted 38 surveys (across 18 sites) in 2007. A champion effort!

Have a happy New Year and safe holiday season.

Local Heroes

The success of Seagrass-Watch depends greatly on the contributions of local citizens and scientists who freely give their valuable time to assess the status of seagrass resources. From time to time, Seagrass-Watch participants are recognized for their efforts by their local communities. In 2007 many local heroes from southern to northern Queensland have been awarded for their contributions to the environment.

In mid 2007, Seagrass-Watch Moreton Bay (SWMB) was recognized as a finalist in the Community Award section for Healthy Waterways, and Simon Baltais (SWMB program manager) won a Healthy Waterways Champion Award.

In the Great Sandy Strait, Hanne Larsen and Robyn Bailey recently received Coastcare Local Hero medals and Gordon and Pat Cottle were both presented with Certificates of Appreciation as Coastal Heroes by the Burnett Mary Regional Group. These awards were in recognition of their outstanding accomplishments and contributions to the region. Earlier this year (issue 28) their group, the Great Sandy Strait Flora and Flora Watch, won the Burnett Mary NRM Coastal Community Award for 2007.

In the Whitsundays, Tony and Beverly Fontes of the Order of Underwater Coral Heroes (OUCH) were awarded a Coastcare Local Hero medal for their outstanding contribution to repairing and protecting the Whitsunday's coast.

In Townsville, several volunteers and groups were awarded Coastcare Local Hero medals for their Seagrass-Watch efforts; building the capacity and involvement of the local community in coastal resource assessment. Award recipients included: Lux Foot and Sharon Taylor (Bushland Beach); Gayle Joyce and Brett Murphy (Belgian Garden State School); U3A (Cockle Bay led by Don Kinsey); Magnetic Island State School; Steve McGuire; Dick Wickenden; and Townsville-Thuringowa Seagrass-Watch (coordinated by Sue Mulvany and Posa Skelton). Earlier in the year (issue 29), Posa Skelton was awarded the Townsville City Council's Sustainability and Environmental Excellence Award for Individual Initiative for Raising Awareness of Marine Conservation.

In Cooktown, the Cape York Marine Advisory Group received a Coastcare Local Hero medal for their efforts monitoring seagrass at Archer Point and mapping the distribution of seagrass meadows for 100km of eastern Cape York coastline.

All Seagrass-Watch participants put in a huge amount of time and effort. The results they achieve are truly remarkable. Through the efforts of our local heroes, we can track global patterns in seagrass health, and assess human impacts which have the potential to destroy or degrade these coastal ecosystems. ♡



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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>

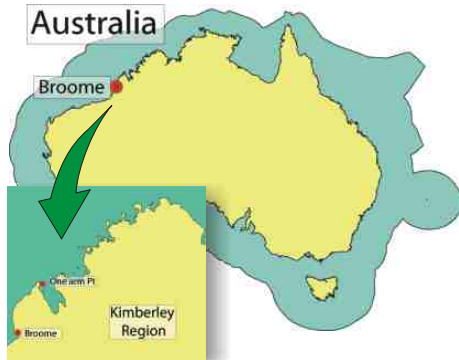
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Australia

Broome, Western Australia

Kirsten Pearce reports

Participants in the Environs Kimberley Seagrass Monitoring Project, which began in February of this year, have been excited to see the Bay transform from an innocuous mudflat to a stunning carpet of



seagrass-green. Seagrass species *Halophila ovalis* and *Halodule uninervis* are plentiful and so also the innumerable marine creatures which seek shelter and food among them. All participants have enjoyed identifying the dugong feeding trails that criss-cross the meadows.

With preparations all in place to introduce seed monitoring into the schedule and the seagrass plentiful, a busy December monitoring round is anticipated. We are also keeping a close eye on the development of the blue green alga, *Lyngbya*. In the past when it has occurred in large dense mats, it has smothered areas of seagrass, effectively reducing food and habitat available to many intertidal species.



Miranda and Karen next to a mat of *Lyngbya* at the monitoring site

Environs Kimberley were thrilled to hear recently that additional funding for the project has been confirmed. This funding will help us to learn more about the ecology of our local seagrass beds and to raise awareness in the local community (and beyond) about the value of seagrass. Having recently started a new volunteer drive, we are hoping that the New Year will attract many fresh faces, in particular school children.



Seagrass meadows adjacent to the loading jetty in Roebuck Bay



Dugong feeding trails in seagrass meadows in front of Town Beach,

We have also been pleased to learn that Broome will no longer be the only Seagrass-Watchers in Western Australia. A second site is being established by the Bardi Jawi Rangers at One Arm Point on the Dampier Peninsular. Both groups are looking forward to being able to work together and learn from each other's experiences. ♡

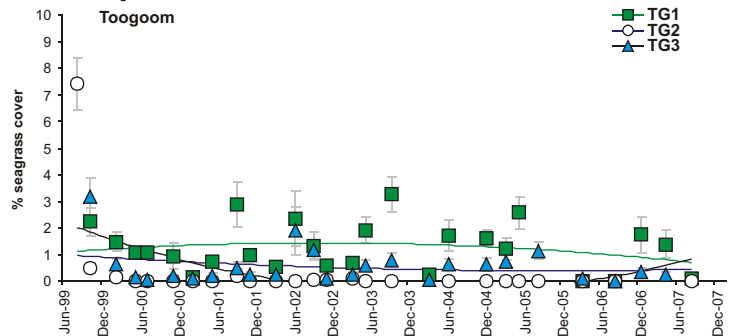
Hervey Bay, Queensland

Trischelle Lowry reports

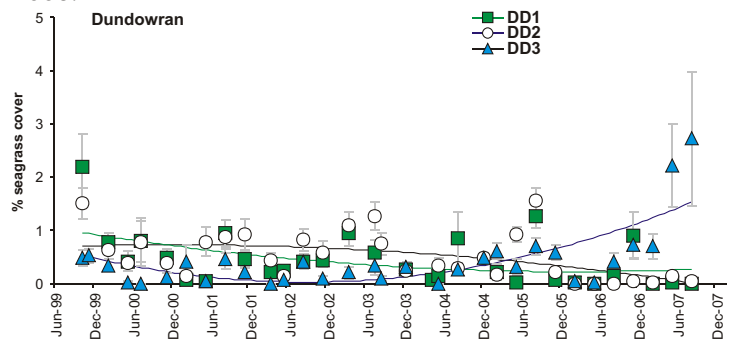


We're back - For a long while we feared our sites here in Hervey Bay would remain bare forever. Although our sites have been scarce of seagrass, our enthusiastic band of volunteers has continued to undertake their regular monitoring.

Throughout the year the Toogoom and Dundowran sites have continued to support small patches of seagrass, mainly presenting itself on the approaches to the transects and eluding our quadrats. Toogoom sites are dominated by a mix of thin leaved *Zostera capricorni* and *Halodule uninervis*. Abundances have remained low and relatively stable, although late spring summer "peaks" occur from time to time.



Dundowran sites are predominately *Halodule uninervis*, with isolated appearances of *Halophila ovalis* and *Zostera capricorni* from time to time. Both DD1 and DD2 have changed relatively little over the last couple of years, but appear to have gradually declined since monitoring began in mid 1999. Seagrass abundance at DD3 however appears to be slowly increasing over the past year, with 2007 abundances significantly higher than 2006.



In October, monitoring at Urangan saw the return of seagrass to both UG1 & UG2 sites which have been barren since late 2005 (when percentages were the highest recorded since the establishment of these sites in late 1999). These sites went from supporting *Zostera capricorni* of 30cm in length to virtually no seagrass present during all of 2006 and most of 2007. Although still sparse, the seagrass meadows seem to be re-establishing themselves, with *Z. capricorni* and *Halophila ovalis* now both present.



Kodee, Keelan & Kade Lowry monitoring Urangan (UG1).

We'll keep our fingers crossed, and hope that our next round of monitoring continues to show improvement across the board. ♡

Great Sandy Strait



Windy wind-up to 2007

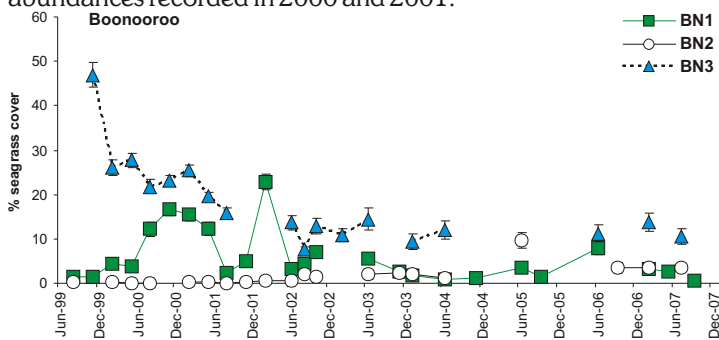
Gordon Cottle reports



A very frustrating final quarter for the year with six attempts to get to Reef Islands and Brown's Gutter cancelled due to strong to gale force winds and heavy squalls. Nevertheless, we were able to monitor locations which could be easily accessed from shore.

Boonooroo

Following a week of cyclonic winds and 400mm of rain, Hanne, Pat and Gordon monitored BN1 on 8th September. There was very sparse seagrass cover and the site was covered in silt and algae. Seagrass at Boonooroo appears to have changed little over the past 5 years, and remains significantly lower than abundances recorded in 2000 and 2001.

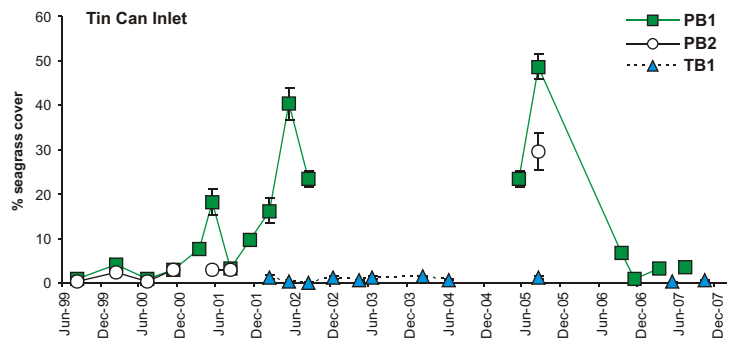


Tin Can Bay

On Sunday, 28th Gordon and Pat went to Tin Can Bay (TB1) in a 30-35 knot gale, which held the water on the site. Seagrass cover was very sparse (maximum 5%), but the ever present algae (identified by HQ as *Acetabularia* sp.), was up to 25% cover.



The seagrass cover at this site has remained low since the site was established in early 2002. Mapping surveys between 1973 and 2002 have shown a significant decline in distribution and abundance of seagrass in Tin Can Inlet and around the township of Tin Can Bay, however the causes are unknown.

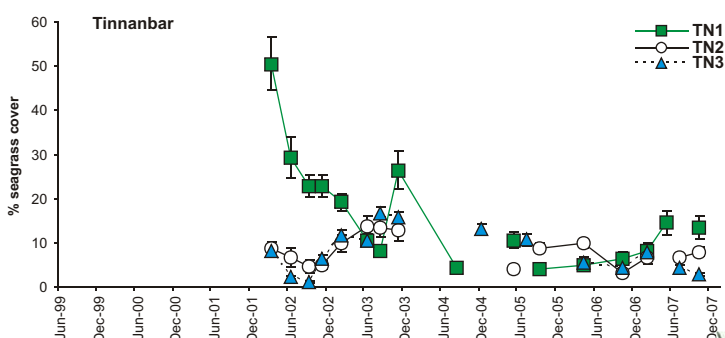


Tinnanbar

Our next successful monitoring weekend was in late October. Hanne, Pat and I went to Tinnanbar (TN1) to be greeted by very healthy *Zostera capricorni* and some *Halophila ovalis* with higher cover (25 to 50%) on the seaward half of the site. The surprise was no dugong feeding trails and an absence of invertebrate activity. Overall, seagrass abundance at TN1 was higher in 2007 than the previous three years.

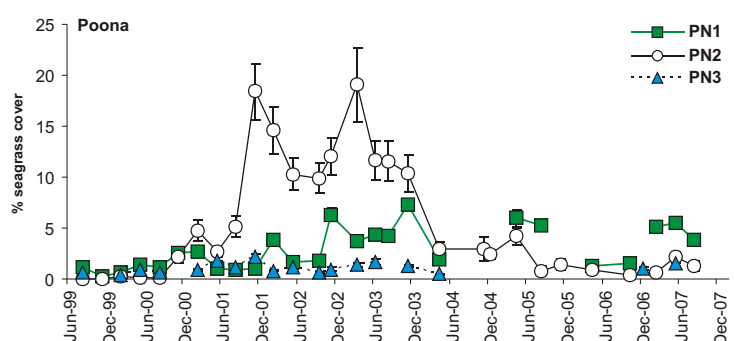
The following day Hanne and two newcomers, Marj and Helen, joined us at TN3. The seagrass cover was very similar to July, but epiphyte cover was much reduced. Could this be a consequence of the extensive freshwater runoff over the previous weeks? Unlike TN1, seagrass abundance at this site remained low in 2007, showing a gradual decline since 2003.

The next day, Robyn and family monitored site TN2, with its mix of *Zostera capricorni*, *Halodule uninervis* and *Halophila ovalis*. Seagrass cover was slightly higher than July, which was in-line with the expected seasonal pattern. Seagrass at this site is often slightly higher than TN3, but significantly lower than TN1. Overall there appears to be little change since monitoring began in early 2002.



Poona

On 10th November, Robyn with new recruit Helen (doing the scribing), monitored PN1. The overall percentage seagrass cover was 3-5% with the usual mix of *Halodule uninervis* and *Halophila ovalis* present on every transect. New *Halophila ovalis* growth was very evident over the whole area. This site has shown a slow but gradual increase in seagrass abundance since monitoring began in mid 1999. Overall, seagrass abundances at Poona were higher in 2007 than recorded in 2006.



Our last foray for the year will be on 8-9th December, when we are hoping for some calmer conditions to add to the 43 sites we have monitored since 1st October 2006.

On other news, I gave a PowerPoint presentation "Seagrasses in the Great Sandy Strait" to twenty Hinkler Venturer Scouts as part of their Environmental Project on the 10th September. It was a very interesting and interested group.

On a personal note, on 7th November I suffered a fall and black out (or vice versa) and have no recollection of the events of the day. I was hospitalised for two weeks and did not stand for ten days. I am now walking with a rollator, exercising, etc. While my physical activities may be limited, I shall continue with organisation and administration of our group.

South East Queensland

Seagrasses of SEQ



The South East Queensland region extends from Noosa in the north to Coolangatta in the south, and includes Moreton Bay and the Broadwater. It is one of Queensland's most important natural, recreational, cultural and economic resources. The Bay features a diversity of foreshore and offshore seascapes and landscapes. Some areas have significant Aboriginal and European cultural heritage values. Although approximately 1.5 million people live in the Moreton region, the Bay fortunately remains mostly in its natural state - an internationally significant wetland providing habitats crucial for migratory shorebirds, turtles and dugong.

Seven seagrass species occur in the SEQ region (*Halophila spinulosa*, *Halophila ovalis*, *Halophila decipiens*, *Zostera muelleri* subsp. *capricorni* (aka *Zostera capricorni*), *Halodule uninervis*, *Cymodocea serrulata* and *Syringodium isoetifolium*). *Zostera capricorni* and *Halophila ovalis* are the most common. Seagrasses are found in extensive meadows throughout the Noosa River system, Pumicestone Passage, Moreton Bay and the Gold Coast Broadwater. Seagrass is however absent from the shallow and turbid western areas between Luggage Point and the Caboolture River. The most extensive seagrass meadows are found in shallow areas of the Eastern Banks of Moreton Bay, northern Deception Bay and around Fisherman Island.

In late October, Len McKenzie and Rudi Yoshida (SW HQ) visited South East Queensland to catch up with local Seagrass-Watch groups and conduct workshops in Moreton Bay and the Gold Coast. Participants from the three regions in SEQ (including Noosa, Moreton Bay and Gold Coast) learnt seagrass biology, ecology, identification, and Seagrass-Watch monitoring.

On Thursday 22nd, Len and Rudi met up with Keira Price (Seagrass-Watch Moreton Bay local co-coordinator) to monitor a site at Victoria Point (VP3). The site was dominated by *Zostera capricorni* and *Halophila ovalis*, with very high epiphyte cover.

The following day was spent at Currumbin meeting Sheila Davis (Seagrass-Watch Gold Coast Local coordinator) and her team at Gecko House and also catching up with Paul Finn (Seagrass-Watch Moreton Bay Local co-coordinator).



Keira Price and Len McKenzie monitor
Victoria Point

It was then down to Currumbin Creek (a catchment approximately 30km in length) to locate a suitable meadow for the Gold Coast workshop. There have been no documented records of seagrass in Currumbin Creek or from the Nerang River upstream of the Broadwater, however narrow meadows of *Zostera capricorni* and *Halophila ovalis* were located fringing the creek banks. Voucher specimens were collected for the Seagrass-Watch herbarium



Currumbin Creek

On Saturday, 24th, Seagrass-Watch HQ conducted a workshop at the Capalaba/Redlands Baseball Club. Participants from throughout SEQ attended, including Noosa Seagrass-Watch local coordinator Lee King and Tara Kingsbury. Carla Sbrocchi and Jane Smith from the Community Environment Network (NSW) also flew in to attend. The afternoon field session moved to Wellington Point after a quick lunch at Indigiscapes Centre. Wellington Point is approx. 22 km east of Brisbane, and extends prominently into Moreton Bay. The point and its adjoining waters are used extensively for aquatic sports. Sediment at the training site is comprised of Mud/Sand and has a lush cover of *Zostera capricorni*, with patches of *Halophila ovalis*, and a number of stray golf balls!



Zostera capricorni, Victoria Point



Halophila ovalis, Wellington Point



Gecko House was the venue for the morning session of the Seagrass-Watch Gold Coast Workshop on Sunday 25th. Gecko House is on the banks of Currumbin Creek and houses office/library/workspace with a meeting hall upstairs for the Gold Coast and Hinterland Environment Council Assn. Inc (Gecko).

The field session moved to Currumbin creek, where 3 transects were run parallel to the shore, a little different to the standard Seagrass-Watch monitoring methods due to the size of the meadow and depth of the creek. It was an interesting session, with participants trying to negotiate the mud along the banks and stirred up sediment from the wakes of speed boats travelling up and down the creek.

Seagrass-Watch HQ would like to thank Simon Baltis, Paul Finn and Keira Price (Seagrass-Watch Moreton Bay), Sheila Davis, George Lewis and Linda Ray (Seagrass-Watch Gold Coast) for their support and effort in making both workshops a success. And to all participants - thank you for attending. 🌱

South East Queensland

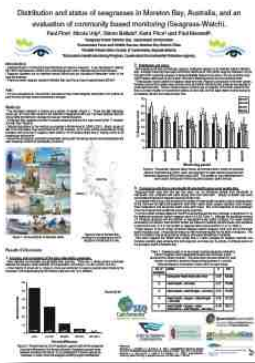
Moreton Bay update

Keira Price reports



We have had a successful year at Seagrass-Watch Moreton Bay. In February Keira Price attended the Gold Coast Coastcare Forum and received a lot of interested from people wanting to be involved in the Seagrass-Watch program we are starting in the Broadwater. The Gold Coast program is now underway with a number of training days having been held throughout the year.

In April we were once again nominated for a Healthy Waterways Award in the Research Category, a wonderful tribute to all involved in the program to be recognised by the nomination.



Seagrass-Watch Moreton Bay was also recognised when Paul Finn gave a talk at the 45th Annual Australian Marine Sciences Association (AMSA) Conference in Melbourne in July and with a poster presentation at the Inaugural Queensland Coastal Conference in Bundaberg in September.

Last month we were very fortunate to have Len McKenzie and Rudi Yoshida down in Brisbane from Seagrass-Watch HQ to run a couple of training workshops. One was held in

Brisbane and a second was held on the Gold Coast. Both days went very well with everyone enjoying themselves and learning a great deal from Len and Rudi's shared knowledge.

All of this along with our regular training days, for new volunteers, and "Day on the Bay" boat trips, as a thank you and advanced species identification training for long term volunteers, have added to a great year for Seagrass-Watch Moreton Bay with more to come in 2008!

The new year will see a few small changes to some of our monitoring techniques as advised by Len and Rudi after their visit. We will provide information on these changes in the seagrass kits as well as running some training workshops and accompanying individual teams into the field.



Noosa River Seagrass-Watch (NRSGW)

Lee King reports

Winter monitoring for 2007 saw the coldest temperatures on record for the Sunshine Coast. This had more of an impact on volunteer participation than on seagrass site characteristics. The reduced, though, enthusiastic team learnt appropriate GPS and compass bearing techniques for accurate re-location of existing monitoring sites.

The lowest temperature is not representative of the entire season which was relatively warm. This accompanied with below average rainfall pattern (low turbidity) resulted in seagrass abundance in 2007 up to 4 times higher than the same period in 2006.

The last 6 months has seen the local coordinator NRSGW 'changing of the guard' from Kristopher Boody to Lee King, although Kris still helps us out when he can. The addition of new members has introduced mapping and spatial analysis capabilities to NRSGW.

The discovery of the 'Upside-Down Jellyfish' *Cassiopea andromeda* in the Noosa river system was an exciting event for NRSGW this round, as no previous record of its presence exist. Other associated faunal species were also in high abundance for the season.



Seagrass distribution Lake Donnellia - winter 2007



Cassiopea andromeda at site WY6 - winter 2007



Conus spp. egg sac at WY6 - winter 2007

Overall the Noosa River seagrass meadows looked very healthy at the time of monitoring, however, a large rain event (1/100yr flood) has impacted the Noosa River system just after monitoring, so all team members are eager to get out there and start the next round to see what impacts may have occurred in the latter part of 2007.

Upside down jellyfish *Cassiopea andromeda*.

Cassiopea andromeda is commonly found in shallow mangrove swamps, mudflats, and seagrass meadows. This jellyfish lies mouth upward on the bottom, in calm shallow water, gently pulsating its bell to create water flow over its arms. Individuals may be varying shades of white, blue, green and brown. The outstretched arms are also brownish with extended frilly tentacles. Adults can grow to 30 cm in diameter. They are often mistaken as sea anemones.

Cassiopea feed on drifting zooplankton, but individuals also harbor zooxanthellae in the tissues on the ventral surface of the jellyfish. The jellyfish sits on the bottom upside-down to provide sunlight to the symbiotic algae. *Cassiopea* also has stinging cells or nematocysts, which is used for protection and capturing food. A sting from *Cassiopea* may result in skin welts, skin rash, itching, vomiting and skeletal pains depending on the individuals sensitivity to the toxin of the nematocysts.

Cassiopea's life cycle includes an asexually reproducing polyp stage, alternating with a sexually reproducing medusoid stage.

Cassiopea is found throughout the Indo-Pacific. However, in the Hawaiian Islands, *Cassiopea* is considered a marine pest; thought to have been introduced from the Philippines by ships as hull-fouling polyps or pelagic stage in ballast water, to Pearl Harbor between 1941-1945.

Whitsundays

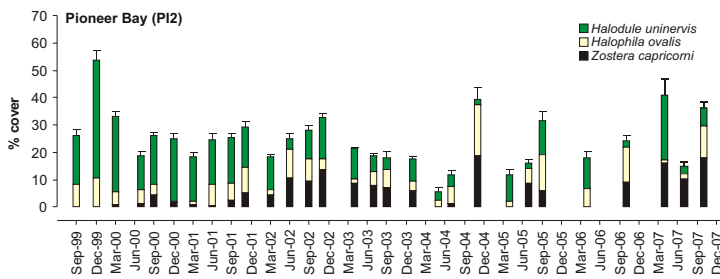
Whitsunday Roundup 2007



Len McKenzie and Rudi Yoshida (SW HQ) visited the Whitsunday region in October to conduct monitoring and set up two new Seagrass-Watch sites as part of the Reef Plan MMP (RWQPP) with funding from the Great Barrier Reef Marine Park Authority. The team visited Hamilton Is (see

over), Pioneer Bay (Airlie Beach) and Hideaway Bay.

With help from QPWS (Kim Hodgson, Dave Harper and Lauren Buckley) and volunteers (Heather Marshall, Kerry Harrison, Dell Williams and John Williams), the Pioneer Bay sites, PI2, PI3 (RWQPP sites) and PI4 were monitored. The meadows also appear to be changing from *Halodule uninervis* dominated to *Zostera capricorni* dominated.

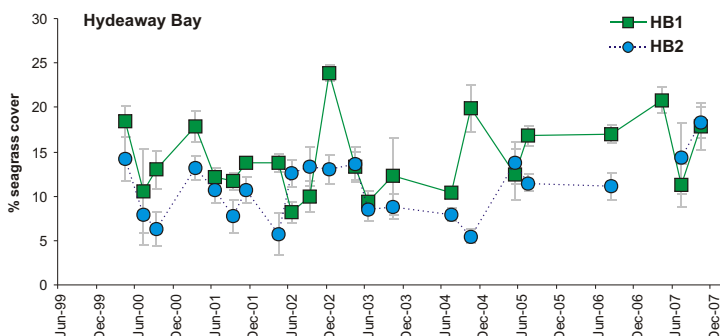


The final location to be monitored in the Whitsundays was Hideaway Bay. The sites are typical reef seagrass habitats, dominated by *Thalassia hemprichii* with *Halodule uninervis* and *Halophila ovalis*. Hermit crabs, stromb shells and holothurians were abundant. The SW Team were also mistaken for "Shell stealers" by locals!



The seagrass abundance at these sites appears relatively stable since monitoring began in April 2000.

Although there have been fluctuations in abundance within years, there appear in line with seasonal patterns (higher in spring-summer, lower in winter). Seagrass species have also remained constant. 🌱



Whitsundays Watch

Kim Hodgson (QPWS) reports.



Pioneer Bay was surveyed on 25th and 26th October 2007. Three sites were monitored (Pigeon Island 2, 3 and 4), in a joint effort between Seagrass-Watch HQ, QPWS and our ever-keen Seagrass-Watch Volunteers.

On Thursday, Len and Rudi (Seagrass-Watch HQ), Dave, Kim and Lauren (QPWS) and Volunteer Heather Marshall arrived at the beach at 1.30pm, all keen, however the tide really dragged its toes to go out! It did eventually and we hooked in trying to re-educate ourselves and our new watcher Heather to get the plots done. We beat the tide and completed out tasks with time to spare. Mean while our seagrass guru's Len and Rudi were undertaking RWQPP sampling, checking of coordinates and seed sampling.



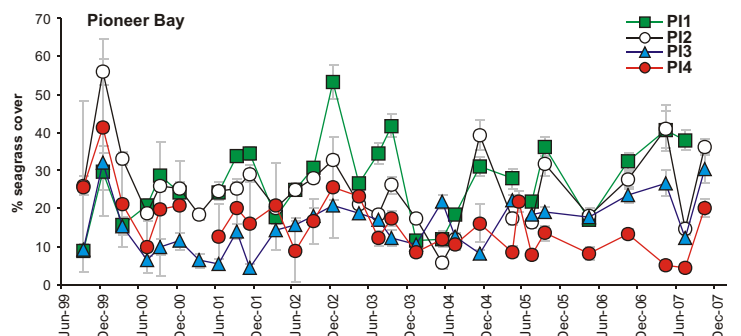
Friday was another beautiful afternoon in the Whitsundays and we were lucky to be joined by seagrassers John and Del Williams (who came up from Mackay), Kerry Harrison and again Heather Marshall (who is now becoming a regular!). Time was on our side and we completed monitoring at both Pigeon Island 3 and 4.



PI3 revealed that the site has been heavily grazed by dugong recently with extensive feeding trials observed, which was very exciting and educational to show our first and second timers.

The filamentous algae cover observed at Pioneer Bay had reduced significantly; our mud, glorious mud, however was still present and made monitoring fun.

As the new Seagrass-Watch Whitsunday local coordinator and with big boots to fill with the departure of Margaret Parr, I'm pleased to say that the community Seagrass-Watch Volunteers are still supporting the cause and making my job easy and enjoyable. Thank you all for your time, effort and great company. See you again soon! 🌱



Whitsundays



Hamilton Island

In mid 2007, Seagrass-Watch monitoring sites were established on Hamilton Is as part of the Great Barrier Reef Water Quality Protection Plan Marine Monitoring Program.

Hamilton Island is the largest inhabited island of the Whitsunday Islands, a collection of wet drowned mountains situated close to the east coast of Queensland, Australia. The Whitsundays was named by Captain James Cook, who



Monitoring HM1 in front of resort

travelled through the area on Sunday 4 June 1770, which happened to be Whit Sunday (the seventh Sunday after Easter). The Whitsundays is a network of 74 islands of which 7 have resort facilities. Beyond the resorts the whole area is part of the Great Barrier Reef Marine Park and the uninhabited islands are all controlled by National Parks and Wildlife.

The most developed island is Hamilton Island, a major local and international tourist destination. Hamilton Island is a world-class resort and includes luxurious accommodation, fine cuisine, and a village of boutique shops, eight swimming pools and nine restaurants. At any one time the Island hosts 2,000 people and approximately 200 boats in its marina. The island centrepiece is the Reef View Hotel which is 19 storey high and boasts the highest external lift in Australia. Hamilton is also the only island to have an airport capable of handling wide bodied jet aircraft.



Hamilton Is Marina

Apart from the resort and village, much of the 750 hectares is still untouched. The island is also surrounded by fringing coral reefs, the largest in Catseye Bay in front of the main resort.

Nine seagrass species can be found in Catseye Bay: *Halodule uninervis* and *Halophila ovalis* are scattered over the sandy intertidal areas; patches of *Zostera capricorni* occur in the intertidal areas at the eastern end of the bay; *Thalassia hemprichii*, *Cymodocea serrulata* and *Cymodocea rotundata* are mixed in amongst the coral on the reef flat; *Syringodium isoetifolium* is present on the outer edge of the reef flat in the shallow subtidal waters; *Halophila spinulosa* occurs just over the edge of the reef crest in deeper waters (>3m); and on the shoreward edge of the coral area are small patches of rare *Thalassodendron ciliatum* (the southern most occurrence of this species in the Pacific).



Cymodocea rotundata (above) and *Thalassodendron ciliatum* (below) found in the eastern corner of the bay



The seagrasses in Catseye Bay are an important component of Hamilton Island's marine ecosystem, providing shelter for fish and prawns and food for green sea turtles. In recent years there has been some concern about the co-existence of tourism and the environment, and the resort is doing it's best to ensure impacts are minimised. For example, a couple of years ago an island resident expressed some concerns about jet-skis operating on the fringing reef close to where he had noticed turtles foraging daily. He witnessed one turtle get hit by a jet ski and several near misses. Although jet-ski's and high speed motorised water sports are permitted in the Whitsunday Plan of Management, the resort operators marked an area of the fringing with buoys to exclude jet-ski's and water sport activities from



where turtles forage most frequently.

The first detailed assessment of the Hamilton Island seagrass monitoring sites (HM1 and HM2) was conducted in late October. Both sites are intertidal and located at either ends of Catseye Bay. HM1 is dominated by *Halodule uninervis*, with some *Halophila ovalis*, and located in front of the main resort within an area where motorised vessels are prohibited. This site is also the main feeding area frequented by green sea turtles. HM2 on the other hand is in the far east of the Bay and dominated by *Zostera capricorni* with *Halodule uninervis* and



Hamilton Is site HM2, with *Zostera capricorni* patch (foreground)



Site HM1, directly in front of the resort

Halophila ovalis. This site has relatively no impacts from boating or resort activities.

To educate Island visitors and guests on the importance of seagrass and the Seagrass-Watch monitoring program, a brochure has been produced and is available from the resort beach hire (see also www.seagrasswatch.org). It is hoped these sites will provide a critical component of the assessment of any long-term improvement in water quality that will occur as best land management practices are widely adopted across the Great Barrier Reef catchments and regions. 🌱



Townsville Region



Townsville-Thuringowa Roundup

Posa Skelton reports

As the holiday season is upon our doorstep, we pause to reflect on the last quarter of Seagrass-Watch surveys for 2007, and reminisce on the achievements and progress we have made this year.

We successfully completed our final survey for the year of Bushland Beach (BB1). Ably led by Lux Foot and his team from Northern Beaches Rotary, it was great to catch up with the friendly faces of Seagrass-Watch. Miss Ee Phin Wong, a JCU student from Malaysia, joined us for her first Seagrass-Watch survey in Townsville.



At Shelley Beach (SB1) our coordinator Sue Mulvany, did an outstanding job in organising and running the survey of this site. The survey was well attended by our community volunteers, and was also assisted by the reef and water quality team, who were sampling nearby.

Our friends and colleagues at the University of the Third Age carried out their survey of Cockle Bay on Magnetic Island on October 7th. What better ways to spend a beautiful Sunday afternoon on the island than on the beach surrounded by a cool sea-breeze. Don Kinsey and his team are sincerely thanked for their continued hard work and contribution to the overall success of Seagrass-Watch in our region.

Due to school activities and programmes, our school sites were not surveyed, except Picnic Bay, which fortunately was surveyed by the DPI&F team (SW HQ) during the Reef Water Quality Marine Monitoring Programme.



On the awareness side, our partners from Conservation Volunteers Australia continue to promote Seagrass-Watch at community events, including the Environmental Expo at Anderson Park on 23 September, the International Volunteers Day (5 December) and CoastCare Week (3-9 December). You can read more on the awards given to Seagrass-Watch during the CoastCare celebrations on page 1 of this issue.



The year 2007 has been an amazing year for Seagrass-Watch activities in the twin-cities.

This was only made possible by the contribution of many individuals and organisations. We thank you all and we look forward to your continued support in 2008.

The sampling dates for 2008 will be posted on our Seagrass-Watch website shortly, so please check out. Finally, I would like to wish all our volunteers, our supporters and their families a safe and happy festive season. Thank you and with best wishes for the New Year. 🌱

Cockle Bay Seagrass

Don Kinsey reports



The weather conditions leading-up to this October monitoring were benign with very normal temperature ranges and generally very calm sunny conditions. There was one rain episode on 1-2 October 2007 with a total of 20mm. The higher ground, from the inner ends of the transects to the mangroves, had returned to its more usual mounded profile. There was very limited seagrass cover on this high ground on this occasion, with stunted *Halophila ovalis* in the hollows and only one patch of *Zostera capricorni* noticed. There was some of the very fine form of *Halodule uninervis* amongst the *Halophila ovalis*.

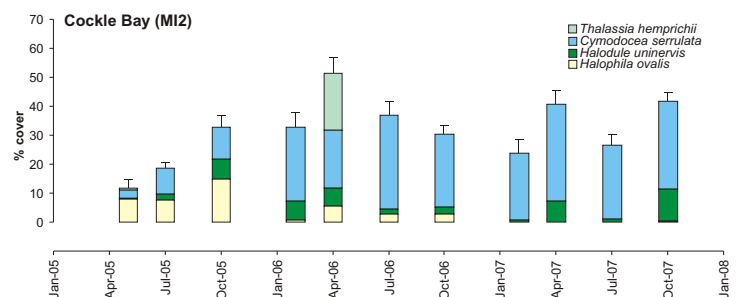
The transect site generally exhibited much less evidence than in July of disturbance by large animals. The large excavation with a deep 45 degree tunnel to about 300mm near the inner end of transect 2 was still there with evidence of regular "maintenance". We still have no idea of the cause of this phenomenon but find it hard to believe it is of human origin. This or similar excavations have now been present since at least April. While it is within 2m of the temperature logger there seems no evidence it would interfere with valid recording by the logger.



As usual, *Cymodocea serrulata* was dominant on all transects with generally similar levels of cover to July 2007 and to October 2006. Cover by *Halodule uninervis* was considerably higher than in July 2007 and in October 2006. There was some limited occurrence of *Halophila ovalis* (absent in July) on transects 2 and 3. *H. ovalis* has been generally scarcer throughout 2007 than in 2006. We found no *Thalassia hemprichii* and seed occurrence was once again very low - only one half seed found overall.

Algal cover on the substrate in the majority of quadrats on transects 1 and 2 was higher than in July. Most was *Halimeda* with foliose reds making up the rest. As usual, transect 3 with its sparser seagrass cover exhibited more algal cover. The epicover on the seagrasses, which was high in all three transects, was predominantly diatomaceous mud with some small filamentous turf algae.

Halimeda spp were very evident in extensive patches over the whole transect area. This is the most *Halimeda* we have seen to date. Green sponges were conspicuous and there were limited occurrence of clumps of foliose reds. No other algal species were notable. 🌱



Townsville Region

Bushland Beach

Lux Foot reports



Saturday 6th October was a pleasant day for monitoring seagrass at Bushland Beach (our last for 2007). Posa bought along a lady from JCU to help and we were very pleased to have Joanne and Percy Shilling from Darwin join us on the day. Joanne is the District Governor for our Rotary District this year. Our district 9550 takes up 20% of Australia and beyond, from Proserpine in the south to Thursday island in the north, out west from Townsville to Tennents Creek, then North to Darwin and on to East Timor. They both enjoyed the experience with us.

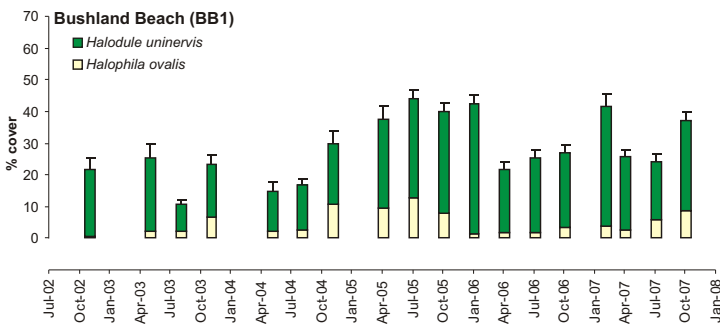


Joanne Shilling (left) and Sharon Taylor (right)

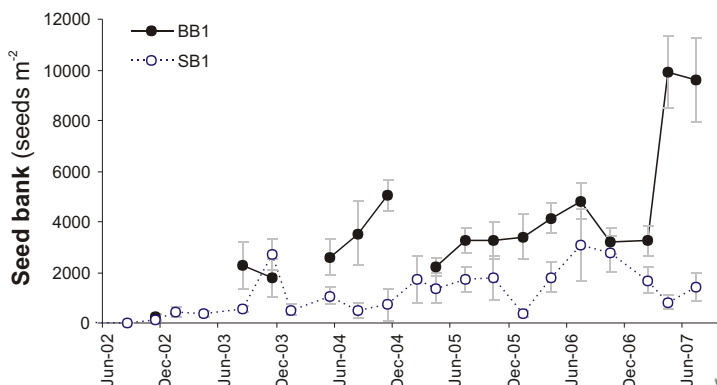
We found that the meadow was a lot greener now that the weather was warmer with seagrass stretching each side of the transects for some distance. This is probably not surprising as we normally expect seagrass to flourish this time of year as part of their seasonal growth cycle. Dugong feeding trails were found inshore of the site, as we were coming back to the beach. *Halodule uninervis* seeds were plentiful, with some 645 counted and also some *Halophila ovalis* fruits, which we had not seen before. The day ended with a BBQ in the park. 🌱



Bushland Beach Crew complete monitoring for another year



The Bushland Beach meadow has gradually increased in abundance over the years since monitoring began in late 2002. Seagrass abundance was also higher in 2007 than 2006. Similarly seed abundance was significantly higher in 2007 than 2006, and higher than adjacent Shelly Beach. Good signs of a healthy and resilient seagrass meadow.



Shelly Beach

Sue Mulvany reports



A great turnout for our monitoring of Shelly Beach SB1 on Saturday 6th October. Thanks everyone.



Our site however seems to be disappearing before our very eyes, with only a third of quadrats with any seagrass at all. It also would have been easier if the tide had seen fit to drop a little more, but with patience the recording was well done.

Again, great to see new and old seagrass watchers with the energy and will to get stuck into something for the environment. Again, we toyed with the idea of constructing some mud shoes, but only encountered one small mud section en route to the site.

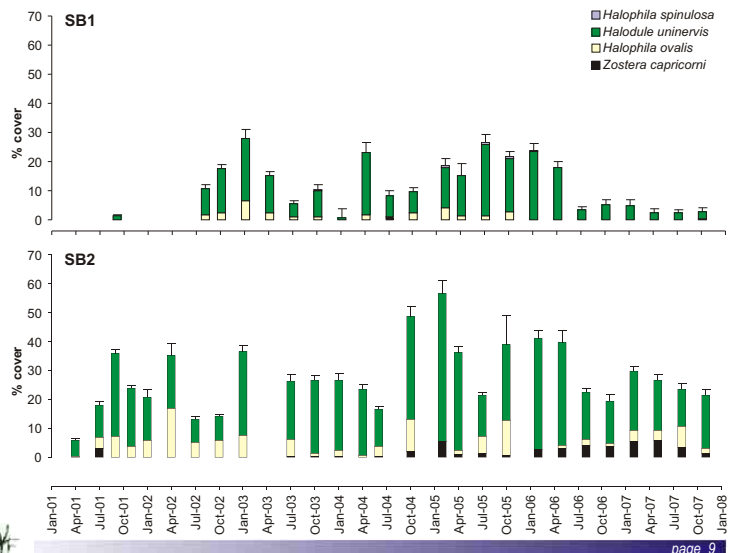


Watchers were: Sarah and Mat Salmon, Karin Flynn, Scott Fry, Linda Berger, Samantha Gibbs, Heather Winstanley, Amanda Young, Mike Whiting, Jade and Chris Taylor, also with help from Becky, Ioni, and Naomi from Seagrass-Watch HQ.

Our next monitoring will be in January and might even be a night time monitoring - an interesting experience in a different set of conditions. Hopefully, we can coincide the survey with the light of a full moon and really enjoy the evening! 🌱

Seagrass abundance and extent at SB1 has declined significantly since 2005. This appears primarily the result of physical disturbance at the site from wave action. The seaward margin of the meadow is severely eroded and seagrass rhizomes are exposed. Large blowouts (erosional features where the seagrass mat is disrupted) are now a feature of the site, and sand movement may be impeding recovery. Fortunately, a significant seed bank remains and seagrass cover in 2007 was higher than recorded in 2001 when monitoring began.

Seagrass abundance at SB2 also appears to have shown a slight decline since 2004-2005, however seagrass abundance in 2007 has been higher than 2006.



Torres Strait



Regional Roundup

Jane Mellors reports

This quarter's monitoring was kicked off at Front Beach (TI2) starting at 5:30am. The tide was already on its way in so monitoring started at the 50m mark. This proved a little



Lachlan and Anto, Front Beach, TI2

confusing for some people but most observers managed to fill in their data sheets correctly. Kanteesha and Jake are well and truly initiated in Seagrass-Watch techniques and have become regular monitors now at all our sites. Lachlan Sutherland (Facilitator - Dugong and Marine Turtle Project, Land and Sea

Management Unit, Torres Strait Regional Authority) supporting a Mo for Movember also joined us for a spot of early morning seagrass watching. As it happened November 4th was also the day of the annual Horn Island to Thursday Island Raft Regatta, so there were other things to watch besides seagrass. Either we are looking closer or flowering is more prevalent (we would like to think the latter) but there was quite a lot of *Halodule uninervis* flowers present.



Jake and Sue monitor TI2, with raft rigging in the background

The next day saw us monitoring Back Beach (TI1). The regular crew of teachers and students allows this site to be monitored pretty speedily these days, particularly as we had the experienced Becky Bowie returning to her old stomping grounds. You may remember from previous editions that Becky Bowie was a Thursday Island High school student who regularly monitored Back Beach (2005-2006).



Rebecca (Becky) Bowie seed searching, Horn Island



Lachlan, Bec, Jake, Anto, Kanteesha and Kinam



Joy, Francis and Becky at Corner Beach, Hammond Island

After Becky left school she still managed to find time to assist us with the monitoring at the start of this year. Becky is currently working with DPI&F in Townsville. When the school heard this, she was invited to return to TI to relay her post school experiences to the current Marine Studies students.

Tuesday, Melbourne Cup day, and monitoring continued on Hammond Island. By the time we arrived on site Francis and Alice had already set up the transects, so with no delay we were straight into it. We quickly did some on the spot training with the new rangers Joy, Daniel and Nancy. This really is quite a lush meadow that supports lots of animals, some not so edible and some that certainly make good kai kai.



Hammond Island monitors

Finally the last site to be monitored was Wongai Beach (HI1). For those of us who had been monitoring for three days already it was a welcome sight for our weary bodies to see the rangers ready and rearing to go down on the beach at 5:45am. Pearson brought John down to check out Seagrass-Watch, which was lucky as it was John's sharp eyes that eventually helped us find our temp logger amongst the



Horn Island Team



Kanteesha and Kinam

mangrove roots.

Well that's that for 2007, and with that we may be farewelling Kinam Salee who has been a regular with Seagrass-Watch since 2005. Not only has Kinam monitored seagrass meadows in the Torres Strait but also in the Whitsunday and Mackay regions. She has topped off her senior year in high school by being presented with numerous subject awards, Senior Girl Swimming Champion, Caltex all rounder student award, and Senior Dux of the School while working and participating in Seagrass-Watch!!! Congratulations Kinam great effort and good luck with your future. ♥



Kinam, Dux for 2007



Another year of monitoring completed on Thursday Is.

Gulf of Carpentaria



Wellesley Islands

The Wellesley Islands are a group of 25 islands off the coast of north Queensland, in the Gulf of Carpentaria. Mornington Island is the largest of the Wellesley Islands and is inhabited by approximately 1200 people. The region is the traditional Sea Country of four different indigenous peoples who all share a similar relationship with their Sea Country. The majority of the islanders are from the Lardil people and are the Traditional Owners of the land and surrounding seas. Yangkal tribal lands consist of the islands south of Mornington Island to the Mainland. The Kaiadilt tribal group are the Traditional Owners of Bentinck and Sweers Islands. The coastal mainland region from Massacre Inlet to the Leichhardt River is Gangalidda people Sea Country.



In 2006, the Aboriginal Traditional Owners of the Wellesley Islands region of the southern Gulf of Carpentaria prepared the Thuwathu / Bujimulla Sea Country Plan to explain their cultural relationships and obligations to Sea Country, and to outline their ideas and commitments for its sustainable use and management.

Thuwathu is the Lardil, Yangkaal and Kaiadilt language name for the Rainbow Serpent that lives in the sea and holds the law of the Sea Country. Bujimulla is the Gangalidda language name for the Rainbow Serpent. The name Thuwathu / Bujimulla Sea Country Plan is used to convey the importance of the Rainbow Serpent in linking together the four saltwater language groups and in the management of the Sea Country.

The Sea Country plan highlighted a number of issues of concern to the people, particularly alarm over unhealthy dugong and turtle reported from hunters. The Traditional Owners believed that one possible cause of this may have been as a result of seagrass dieback causing a shortage of food to the animals. The Sea Country Plan identified that research was required to answer the uncertainties and to help with developing zoning plans for the management of their Sea Country.

The Traditional Owners, through the North Australia Indigenous Land and Sea Management Alliance (NAISMA) and the Carpentaria Land Council Aboriginal Corporation (CLCAC), approached DPI&F and Seagrass-Watch HQ requesting support and assistance for mapping and monitoring the seagrass habitats that surround the Wellesley Islands.

The first activity was to map the seagrass of the Wellesley Island group, which was carried out in August 2007 by DPI&F (issue 30). The second activity was to conduct a Seagrass-Watch training workshop and establish a suitable monitoring site on Mornington Island. ♡



Mornington Island Workshop

Jane Mellors reports

In late October, Seagrass-Watch HQ conducted a training workshop with the Wellesley Island Rangers on Mornington Island.

With Seagrass-Watch HQ assistant Anto Wilson, we began our workshop despite the torrential downpour on the first day. First up was the formal presentations, which at times to be heard over the rain on the tin roof was challenging. The rangers particularly enjoyed the opportunity to learn more



Workshop participants missing Wayne



Kevin and Wayne

about seagrass identification and the mock transect exercise we held inside. At the end of day one we agreed to reconvene the next morning to see if the road to our proposed Seagrass-Watch site at Ganthawu was passable. This location was identified as suitable from the results of the mapping, a couple of months prior.

Luckily for us the rain had abated and we set off in the troopie to get to the site, roughly an hour's drive. After a little searching and directing from Wayne we agreed

on a representative area of the seagrass meadow between Mornington Island and Sydney Island and WI1 was established.

This meadow is predominantly *Halodule uninervis* with some *Halophila ovalis*. The sediment varied from mud/sand to sand/mud which translates into a bit of a slog at times. The heat and humidity at times was almost unbearable (what's that about mad dogs and Englishmen in the midday sun well add Seagrass-Watchers to that as well!!!). Despite these challenges Wayne, Alfred, Gerald and Kevin all took to monitoring like ducks to water, we even sampled for seeds though enthusiasm was waning after an hour and half of being in the sun (it really was hot). We all agreed that it was great to be out on country and doing something for the marine environment. Many thanks to the traditional owners for allowing us access to this sea country and for the Carpentaria Land Council for supporting this initiative. ♡



Alfred, Gerald and Anto





Viet Nam borders the People's Republic of China to the north, Laos to the northwest and Cambodia to the southwest. To the country's east lies the South China Sea. With a population of approximately 84 million, Viet Nam is one of the most densely populated nations in Southeast Asia.

Viet Nam is approximately 331,688 square km (128,066 sq miles) in area. The perimeter of the country along its international boundaries is 4,639 km (2,883 miles).

There are 11 species of seagrass (*Cymodocea serrulata*, *Enhalus acoroides*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila beccarii*, *Halophila minor*, *Halophila ovalis*, *Syringodium isoetifolium*, *Thalassia hemprichii*, *Thalassodendron ciliatum* and *Zostera japonica*) in Viet Nam distributed along the coastline, mostly in the central and southern provinces. Their status is unknown, though in general the Viet Nam coastal zone has been heavily impacted by sedimentation and domestic and agricultural pollution. Viet Nam has at least 440 sq km of seagrass, as determined from remote sensing and ground-truth surveys.



Halophila beccarii meadow

Viet Nam is at the overlap of temperate and tropical seagrass species with *Zostera japonica* growing intertidally in the north and mixing with *Halophila ovalis*, while in the south the species composition is similar to the Philippines and Malaysia.

Establishing Seagrass-Watch in central Viet Nam.

Gail Begbie (Binh Dinh Fisheries Dept.) reports



Zostera japonica

The creation of a marine rehabilitation site known as the Con Chim Marine Sanctuary (CCMS) is an ambitious program being run by the Binh Dinh Fisheries Department. This project which covers 480ha in the 5060ha estuary of Thi Nai, is designed around the participation of three coastal

communes that rely almost entirely on the marine resources of Thi Nai Lagoon for their livelihoods. Thus the CCMS aims to not only protect mangroves and seagrass but also to train local coastal communities in sustainable aquaculture techniques.

Joining Seagrass-Watch has allowed our project to gather data on our 5 seagrass species and condition of the seagrass meadows, a core protection zone. Conducting transect monitoring has been a learning process, for the management personnel as well as the onsite team, attracting much curiosity and to the amusement of local shellfish collectors. We are now in



The Con Tau site

the midst of only our second sampling, which has been complicated by the monsoon season. Within the three selected monitoring sites, we are finding *Zostera japonica* and *Halophila ovalis*, with the other three species mainly occurring in the isolated pockets often found in disused shrimp ponds. The monitoring program is in its early stage here at the Con Chim Marine Sanctuary, but the highly social days during which we work our transect lines are already a favourite calendar event for our team. 🌱

Gail Begbie (Marine Conservation Advisor) is a volunteer through the New Zealand Volunteers Services Abroad.



Local fishers



The monitoring team (Gail Begbie 3rd from left)





Team
SeaGrass

TeamSeagrass Roundup Siti Maryam Yaakub reports



Hello fellow seagrassers of the world! We at TeamSeagrass would like to announce that we're done with monitoring. We've had enough! No more, nada, zilch we've packed away our quadrats, measuring tapes, tent pegs and compasses. If you were

hoping to catch us in action, donning the ever-fashionable standard sheets and clipboard ensemble, tough luck because it's not going to happen anymore... At least not till next year! Gotcha good didn't we?

It was a fantastic year for TeamSeagrass. We've come pretty far this year and it has been a rollercoaster ride (albeit a wet and muddy one) of being up at ungodly hours, getting wet to the waist, amphibious landings and burnt barbeque chicken wings! We've borne witness to inspiring sunrises on a patch reef in the middle of nowhere and picturesque sunsets on Singapore's landfill island. As a roundup, let us take you on some of the memorable events that took place this year:

First amphibious landing at Cyrene Reef

Amid a backdrop of petrochemical refineries and other such industrial installations, we made our first daring attempt at an amphibious landing on Cyrene Reef. The Cyrene Reefs are a bunch of patch reefs located along a busy shipping thoroughfare. We've learnt through the grapevine that there are seagrasses on the main patch reef and naturally, couldn't wait to set foot on it.



Getting onto and off the patch reef was an adventure because the reef is only exposed at very low tides. When the tide receded to expose a huge bed of seagrass, we were smitten and the rest is history.

TeamSeagrass team get-together

September is literally a dry month for us because the tides aren't low enough for a trip so we held a team get-together and newbie training on 22nd September 2007 instead. The event was one of the few occasions where team members saw each other scrubbed up, dry and on dry land! Aside from a few "Oh my goodness I didn't recognize you without all the mud" moments, we had a fantastic time catching up. We had a couple of newbies sign up and the more experienced members of the team shared their personal experiences and what they love about the



shores. After the sharing session, we headed outside for more merrymaking in the form of a barbeque and drinks.

We also turned one in September, which was the month a year ago in 2006 when Ria and myself decided it'd be a good idea to start seagrass monitoring in Singapore. Our friends made us this birthday card!



Rained on at Chek Jawa

The last seagrass monitoring session at Chek Jawa was memorable because we got rained on. It was the only monitoring trip the entire year when it actually rained cats and dogs, which is pretty amazing given that afternoon showers are the norm here. We thought we would have to cancel the trip because there was thunder and lightning, but fortunately, that went away, leaving us with just the rain and strong winds to deal with. Of course, that was no hindrance to the tenacious members of TeamSeagrass!



TeamSeagrass at Clean and Green Singapore Jamboree

This was our first ever exhibition and boy did we slog for it! The Jamboree was a great opportunity to raise public awareness of seagrass habitats and display the work TeamSeagrass has been doing. It was very successful and the Prime Minister himself dropped by to say hello! Thanks to Nor Aishah, Sijie, Gaytri, Kok Sheng, Dickson, Andy and Ron for helping out at the booth!



Last Monitoring Session at Pulau Semakau

We arrived at Pulau Semakau for our last monitoring session for the year and it felt as if nature decided to reward us with blue skies and a picturesque sunset as a last hurrah.

So that's the round up! We'd like to thank everyone who has helped us in one way or another and especially to Len and Rudi at Seagrass-Watch HQ for being so awesome. We'll be back next year, but till then, Happy Holidays and a Seagrassy New Year to all! 🍀



Turtle Research

Sorting turtle mush

Posa Skelton

With plastic vials held aloft, bubbles of trapped air rise to the surface, as Vetea Liao and Helene Legrand our JCU French student volunteers began an endurance battle sorting the turtle mush for any semblance of a living structure. What they were delving into were over 100 samples collected by Ian Bell, a PhD candidate researching the diet of Hawksbill turtles on the Great Barrier Reef. The short item below was prepared by Vetea and Helene at the conclusion of their work.

The importance of marine plants in coastal water ecosystems

Vetea Liao and Helene Legrand (James Cook University masters candidates) report



Helene and Vetea discussing the identity of a mush specimen from over 100 vials of samples

Seagrasses and algae may not win the prettiness contest of marine inhabitants but their function is unsurpassed. These plants play an important role in many ecosystems as they are the base of trophic relationship and support a great variety of herbivores from crustaceans to fishes and megafauna. Seagrass meadows in particular are indispensable

for ensuring the survival of dugongs, sea turtles and other critically endangered animals. Indeed marine plants constitute the base of their diet as dugongs and green turtles feed primarily on seagrass. Therefore the degradation of coastal waters by untreated sewage, terrestrial runoff and pollutants will negatively impact these feeding grounds, contributing to the decline of turtle and dugong populations, which are already critically endangered.



As we learn more about our marine species, we are also discovering new information particularly on the role of marine plants. For example, among marine turtle species, the Hawksbill turtle *Eretmochelys imbricata*, also critically endangered, is considered as feeding primarily on sponges. Much of this information is based on a small research carried out in the Caribbean. Does this scenario hold true in other parts of the world, like the Great Barrier Reef? This is a question that Ian Bell is trying to address. Ian's research consisted of collecting food from the mouth and stomach of Hawksbill turtles.



Hawksbill turtles caught on Green Island for research

Back in the laboratory, samples were analysed to identify the type of algae and other species present and how important they were in the *E. imbricata* diet. Unfortunately identifying algae species when the digestion process has already started is not a simple or a bed-of-rose's task. Toughness, shape of tips, arrangement of cells and many more clues were used in order to identify algae at the species level when possible. Out of 102 samples, at least 33 different algae species were identified with 22 species belonging to the red algae family. Stomach samples also contained sponges, seagrass, ascidians, anemone, soft corals, copepods and other small crustaceans.



Collecting food from the crop and stomach of Hawksbill turtles on Green Island

While determining Hawksbill's diet may not seem exciting to everybody, it is critical to have these baseline data to be able to predict what will happen to these animals if marine plant species are impacted by ocean acidification and other climate change effects.

It is also crucial to learn more about our critically endangered species to be able to efficiently protect their



Ian Bell (left) with French film crew and team on Green Is.

habitat and foraging areas to prevent regional extinctions. Just as important, people have to be aware of the significance seagrass meadows and algae are for the ecosystem and the impact that degradation of coastal water may have on dugongs and turtles. 🌿

Hawksbill Turtles



Adult hawksbill turtles have brown colouration, extensively variegated with brown and black on their carapace. A distinguishing feature of the hawksbill turtle is their distinctive parrot-like beak and narrow head. The pointed jaws are well adapted to prising food from crevices in and around coral.

Hawksbill turtles occur in all oceans usually in tidal and sub-tidal coral and rocky reefs in tropical and subtropical areas. In Australia, their main feeding area is on the east coast, including the Great Barrier Reef. Other feeding areas include Torres Strait and the archipelagos of the Northern Territory and Western Australia.

Hawksbill turtles are a circumtropical species that nest in low density throughout the world. Australia holds the largest remaining rookeries in the world. There are three main breeding areas in Australia - northern Great Barrier Reef, north-eastern Arnhem Land (Northern Territory), and Western Australia. Although hawksbills breed throughout the year, the peak nesting period occurs between January - April in Queensland, July - September in the Northern Territory, and October - January in Western Australia. Growth is slow and variable over the life of the individual with the estimated age to maturity greater than 31 years.

Our Day of Seagrass Studies

Georgia (Grade 7, Bowen Primary School)



On Friday 24th August, 2007 selected students from the Grade 7 at Bowen State Primary School went down to the Front Beach to learn about seagrasses. We were put into 5 groups to do different things.

Three groups went around surveying transects along a 50m length, surveying the seagrass cover, if there were any starfish, crabs, and other animals, how long the grass was and what the percentage of epiphyte cover was.

One group took photos at each section of each transect and another group took samples of seagrass seeds.

We completed the tasks and the data was sent to Townsville for further study. We received our own seagrass monitoring kit from the Burdekin Dry Tropics and continue to monitor the seagrass each term and collect the data. We are proud of our work and hope to see the "Seagrass-Watch" continuing on at Bowen State for many years. ♡



Townsville Grammar School

Amanda Young reports

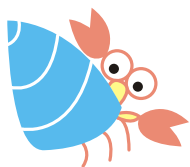


In late October, Year 11 Biology students from Townsville Grammar School were involved in

Seagrass-Watch. The students had been studying Ecology and were required to spend some time in the field, working on an ecological project. Seagrass-Watch was able to provide this admirably on account of Rowes Bay (the site allocated to us for the study) is close to the school which provides the students with a feeling of responsibility/ownership and Seagrass-Watch HQ staff were available to assist students learn the Seagrass Watch sampling techniques. Seagrass-Watch HQ also provided the students with good role models for future careers as they possessed a variety of educational backgrounds from having just finished high school to PhDs.

During the course of sampling, students were fortunate to experience flyovers by DPI&F staff in helicopters that were mapping the entire Rowes Bay seagrass meadows. This allowed students to see a broader scale survey technique in action. Students were required to record all their observations in a field logbook as part of their assessment as well as complete the Seagrass-Watch data sheets. Back at school, students drew seagrass specimens and figured out their classification. Later the students researched the role of seagrass in the marine ecosystem and threats to survival. They also investigated linkages between seagrass habitats with adjacent ecosystems mangroves and coral reefs.

The Year 11 Biology students and teaching staff from Townsville Grammar School would like to thank Seagrass-Watch HQ for supporting our fieldwork with equipment and personnel. We would like to pay particular thanks to Dr Jane Mellors, and Naomi Smith. This excursion provided the students with a hands-on ecological experience and gave them an insight into the work of biologists. It also helped them to appreciate that there is a lot more to seagrass than meets the eye! ♡



Animal facts

Polychaete worms

by Len McKenzie & Keira Price

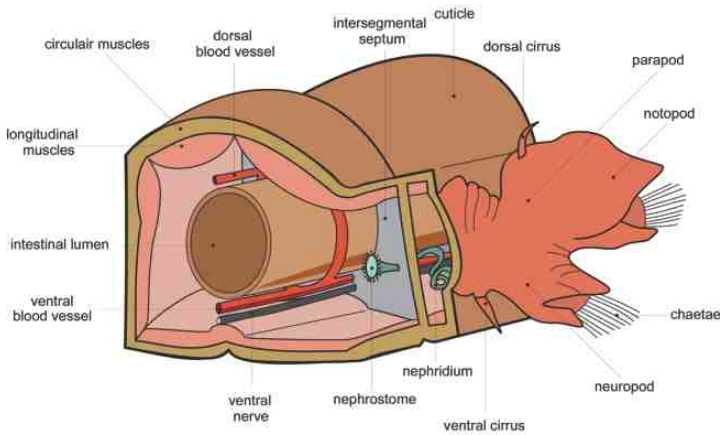
Polychaeta or polychaetes are a class of annelid worms, generally marine, with a pair of fleshy protrusions on each body segment called parapodia that bear many bristles, called setae or chaetae, which are made of chitin. Polychaeta means "many-bristled" and indeed the polychaetes are sometimes referred to as bristle worms. Each body segment apart from the head and last segment are identical, the internal and external organs being repeated in each segment. More than 10,000 species are described in this class, but common representatives are the



Borstenwurmer des Meeres". A variety of marine worms. In: "Das Meer" by M. J. Schleiden, 1804-1881, p. 446. Image courtesy of Treasures of the NOAA Library Collection

fan-worms (*Sabellid*) and the sandworm (*Nereis*).

The polychaetes' paddle-like and highly vascularized parapodia are used for movement and act as the animal's primary respiratory surfaces (parapodia can be thought of as kinds of external gills that are also used for locomotion). Polychaeta also have well-developed heads compared to other annelids. Polychaetes are extremely variable in both form and lifestyle and include a few taxa that swim among the plankton. Most burrow or build tubes on or in the bottom, and some live as commensals. A few are parasitic.



Polychaeta anatomy. Image courtesy of Wikipedia.org

The mobile forms (*Errantia*) tend to have well-developed sense organs and jaws, and actively hunt prey. One free-living group often found in seagrass meadows are the fire-worms. Their bristles, along with a snakelike body motion, allow them to move quite quickly. In some species their bristles have developed into defensive weapons;



Polychaete (Pulau Sekudu, Singapore).

hollow tubes filled with poison which break off easily if the fire-worm is attacked causing pain to the attacker. Fireworms may also release their bristles into the surrounding water. So take care when exploring your quadrats!



Worm tube polychaeta (Changi, Singapore).

The stationary forms (*Sedentaria*) have specialized gills or tentacles used for respiration and are deposit or filter feeding. Many of these worms form a hard calcareous tube (secreted from a special gland) while others have leathery tubes covered in shell, sand and mud.



Eunice aphroditois (Sentosa, Singapore)

Sedentary worms are usually filter feeders, consuming microscopic plankton that they sieve from the water column using feathery tentacles that surround their mouths.

Polychaetes, unlike earthworms which are hermaphrodites, usually have separate sexes. The eggs hatch into trochophores, a type of planktonic larva which then metamorphoses into a juvenile annelid. Some of these worms however reproduce asexually by breaking off segments which then become other individual worms.

Polychaetes are found in both cold and warm waters, and are very adaptable. One notable polychaete, the Pompeii worm is endemic to the hydrothermal vents of the Pacific Ocean. Pompeii worms are thought to be the most heat-tolerant complex animals known. These worms can be 1.5 m long and rely on bacteria living in their tissues to synthesise organic molecules from the nutrient rich waters to provide them with energy.

Polychaetes are good indicators of water quality in marine environments, as they are one of the most tolerant marine organisms to stressors (e.g., low oxygen, organic contamination of sediment, and sewage pollution). Elevated water column nutrients may result in increased filter feeder abundance and changes in sediment deposition/type can affect deposit feeders, as some species prefer sand dominated sediments, while others prefer muddier sediments. Polychaetes are also a good food source for fish and the many shorebirds that can be seen foraging on the seagrass meadows at low tide. ♡

All polychaete photographs courtesy of Ria Tan (Wild Singapore)



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