Seagrass-Watch news

Seagrass-Watch Local eyes Global view

Issue 28 • March 2007

Seagrass-Watch 2007 monitoring has started in earnest, as some regions have used the opportunity to collect during the southern summer period, often missed due to vacations or lack of suitable tides. Several training workshops have also been conducted, so it looks like a productive year ahead.

In this issue you can read reports from several of the regions and countries currently participating in the program. Read about the Torres Strait Land & Sea Rangers who will be using Seagrass-Watch as a tool for actively involving the resource owners in a practical manner to assist with the management of their sea country. Learn about mangroves - our sea "trees", and the exploitation of seagrass meadows in Indonesia. Catch up on what's happening in Roebuck Bay and the blooms of *Lyngbya* affecting the area.

Read about the introduction of e-bulletins, updating registered participants about seagrass news from around the world and within the program. Also read about the popularity of the website and the recent inclusion of a virtual herbarium.

Finally, congratulations to Great Sandy Strait Flora & Fauna Watch, winners of the Coastal Community Award in southern Queensland in recognition of their monitoring efforts. Well done!!

What's inside:

Torres Strait Rangers take on Seagrass-Watch

Australian Government

Kaiwalagal and Hammond Island Rangers in Torres Strait joined Seagrass-Watch as part of the NHT Marine Debris project, funded by the Australian and Queensland Governments via the Torres Strait Regional Authority (TSRA). The project objectives are to: monitor, clean-up and protect their islands' shorelines and marine environment. To achieve these objectives, a partnership between Hammond Island Council, Kaiwalagal Aboriginal Corporation, Queensland Department of Primary Industries & Fisheries, the Carpentaria Ghost Nets Program and the TSRA Land & Sea Management Unit (LSMU) has been established

Jane (SW HQ) explaining how to ID seagrass species

As part of its commitment to this project, Seagrass-Watch HQ traveled to Thursday Island at the invitation of the LSMU to conduct a Seagrass-Watch training workshop based on participatory learning. The rangers learnt about seagrass ecology and threats, how to establish monitoring sites, biological measurement techniques, species identification and how Seagrass-Watch information has been used to assist management and conservation efforts. The training also included a short course on the use of a Global Positioning Systems (GPS). This component of the workshop included a "treasure hunt" which saw participants searching Douglas Street to locate markers at pre-established waypoints. The workshop achieved its objective in providing the rangers with the necessary skills and tools, enabling them to monitor this environmentally and culturally significant marine resource.

Above: Len (SW HQ) with the Hammond Is nursery ladies during the GPS field exercise.

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

Pearson Wigness (Kaiwalagal Rangers, Horn Island) identifying seagrass

Above: Steven Ambar with his group during GPS outdoor training. Left: Francis Dorante looking on.

The information the rangers collect in future monitoring will be relevant to management decisions concerning the protection of this habitat, the sustainable use of fisheries resources that are dependent on it and the conservation of threatened species. This is the first step in actively involving the resource owners, who have the practical and spiritual connection to this resource, in the management of their sea country.

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

Townsville Region - Queensland

Shelly Beach

With a low tide of 0.33m at 0306 on Saturday January 20th a band of eleven diehard Seagrass-Watchers rolled out for a touch of early morning monitoring. Lucky they were diehard as we had to endure squalls of torrential rain while waiting for the tide to drop. All that aside, Dick was determined to get us on site and monitoring. The GPS got us close to the mark, but it took Catherine almost stumbling over the peg to actually locate our site as the middle transect was still underwater. Not to be deterred we still set up the transects and started monitoring Transect one as it was primarily exposed and got underway with the seed counts.

Taking photographs did prove interesting as there was no ambient light at all so it was a case of point and shoot and check later to see if the quadrat had been captured. Seed counts appeared to be on average the same for the site since October though one core had a massive 26 seeds in it. Where seagrass was recorded, per cent cover was higher than our previous monitoring trip but fewer quadrats recorded seagrass, as the sand banks and blow outs appear to have gained in magnitude. Valiant effort to those who participated and thanks to TSVQPWS that allow this night time monitoring to occur.

Naomi Smith reports

It seemed like Mother Nature was against us this monitoring day at SB2, as there was a sighting of a rogue crocodile near our site the day before and the tide was not dropping due to the wind and rain, but that did not stop this passionate group. There were a total of nine people that attended including regular volunteers, Mike, Catherine and Holly, Townsville/Thuringowa co-ordinator Sue, CVA Coastal Education Officer Adam and DPI&F employees Jane, Carla, myself and newcomer Suz.

With the wind pushing up our tide we had to tackle the ankle to knee deep mud just to walk out to our sandy/muddy site. Once there, everyone worked efficiently at their tasks and even the occasional showers of rain couldn't dampen our spirits. Once again the seagrass meadow was predominately *Halodule uninervis* and, I'm happy to say, there were many dugong feeding trails observed. Seed counting kept us busy with the highest number of seeds recorded was 16. Our last challenge of the afternoon was walking back along the beach as the wind had picked up and it felt like we were being sand blasted, as Suz said we must have looked like Crumbed fillets!

Bushland Beach Feb 2004

Lux Foot reports

Our site at Bushland Beach is between the Bohle and Black Rivers, which are home to many crocodiles, some up to 5m in length. That is why we do not monitor at night, even though some of the best tides during the January / February period are at night. However, we found that the 18th February at 3pm was within reason provided there were no cyclones about. There were strong winds out to sea which increased the tide by 10cm this gave us some problems.

There were 14 of us who ventured out. Due to the 800 odd mm we have received over the past three weeks, the water was quite turbid.

The flood in the Bohle River was the highest for several years, this being so, it will make for interesting monitoring the meadow to see the result of so much fresh water.

Townsville-Thuringowa Seagrass-Watch

Posa Skelton (TTSW Local Coordinator) reports

Three months down the track and Townsville-Thuringowa Seagrass-Watch has certainly been a hub of activities. Reports from the site coordinators have been encouraging especially with the number of community volunteers participating. Despite the dreadful low tide times, the community turnout has been incredible. A pat on the back to all our volunteers!

An exciting development for our region is our teaming up with Conservation Volunteers Australia (CVA) to strengthen our Seagrass-Watch activities. Funding support from the Burdekin Dry Tropics NRM through the Natural Heritage Trust has enabled the appointment of Adam King at CVA. Adam is in the process of updating site kits with new stationary, waterproof datasheets, new booties and even a few Global Positioning Systems (GPS) will be provided to some of the sites. We are also currently working on improving and updating our public awareness displays and we welcome suggestions and ideas from our seagrass-watch fraternity.

Clean-up Australia Day on March 4th was also a special day for our twin city residents with Thuringowa Better Earth Expo Day being held at the beautifully landscaped Riverway on Ross River. Seagrass-Watch was represented under the shade of a rain-tree along with many other community conservation groups. Many thanks to Adam for manning the display all day and to Naomi Smith for her unfailing support.

Despite the stifling heat, we managed to sign up some new members. We welcome our newest members and we look forward to Seagrass-Watching in the near future.

Cockle Bay, Magnetic Island, Summer Monitoring

Don Kinsey (U3A) reports

The summer monitoring by our U3A Earth and Sea class was carried out on 18 February 2007. Jane and Naomi (Seagrass-Watch HQ) helped with the seed sampling for which we were very thankful as our normal seed sampling person is unlikely to be able to do any future monitoring. Jane and Naomi also helped to train our proposed replacement. As always been the case, we are finding almost no seeds at this site.

The tide was late and very marginal while being the only real option for this month. Nevertheless everything went well.

This set of observations was arguably the most removed from the average condition that we have so far seen in our monitoring.

It followed around 900mm of precipitation on the island during the wet season so far (Dec, Jan.,and Feb to date)

Halophila ovalis was completely absent from our transects. *Cymodocea serrulata* was very dominant and exhibited very high cover. *Halodule uninervis* was present in minor amounts and we found no *Thalassia hemprichii*.

Algal cover was the lowest we have so far seen with the usually fairly dominant foliose reds absent except on the outer half of Transect 3. *Padina* sp. was apparently absent. *Halimeda* spp were

common in the outer half of the transects. Other algae with relatively sparse occurrences in the general area of the transects were: *Turbinaria* sp in the outer half of the transects; *Sargassum* spp in the outer third of the transects; and very occasional *Dicytyosphaeria* 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 cover of *H. ovalis* which was stunted and dark in colour. There were patches of very narrow-leaf *Halodule uninervis* and, occasional patches of Zostera *capricorni*. Both these latter species have not been noted before in this location. There was no evidence of the *Enteromorpha*-type green filamentous alga on this higher ground.

Much epi-cover was a fine muddy diatomaceous layer with considerable 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 were quite common in the site.

Townsville-Thuringowa Seagrass-Watch Goes From Strength to Strength

Due to increasing interest in the region, a Seagrass-Watch Awareness & Training Workshop was held on March 18th at the Arcadian Junior Surf Life Saving Clubhouse. This workshop was supported by the Burdekin Dry Tropics Natural Resource Management (BDTNRM), the Australian Government's Marine and Tropical Sciences Research Facility (Department of the Environment and Water Resources) represented in North Queensland by the Reef and Rainforest Research Centre (RRRC), and the Queensland Department of Primary Industries & Fisheries.

The classroom participants.

Preparing for the field, Rowes Bay.

The workshop presented by Dr Jane Mellors and Naomi Smith from Seagrass-Watch HQ was attended by 26 people, keen to learn about seagrass and Seagrass-Watch. The participants listened to presentations on seagrass biology, ecology and the extent of the Seagrass-Watch program. Following the lively presentation on seagrass identification, participants identified six species of seagrass and prepared herbarium specimens during the laboratory session.

Setting up the transects

Catherine records

After a morning of presentations, a field session was held at the Rowes Bay site RB1. Naomi and Jane were ably assisted in the field by long term local Seagrass-Watchers Lux Foot and Catherine Walsh. This enabled everyone to have a go at all aspects of monitoring from estimating seagrass percent covers, measuring canopy heights to counting seeds. All in all it was a successful workshop made memorable by the amount of positive feedback. Thanks to everyone who contributed and the BDTNRM region now has 22 more informed new Seagrass-Watchers!!

Lux (BB site coordinator) quizzed about

HAVE YOU SENT YOUR DATA TO HQ??

If not, your data cannot be used for regional and global assessments

Great Sandy Strait Fauna and Flora Watch

Gordon F Cottle reports

A most exciting start to this quarter with the news that, as Local Coordinator for the Great Sandy Strait Seagrass-Watch, I had been granted funding from Burnett Mary Regional Group Natural Resource Management to continue our activities for the period 1st October, 2006 through to 30th June, 2008. Most welcome monies to particularly reimburse vehicle, vessel and accommodation expenses for all of the team.

Hanne Larsen and Pat Cottle at BN1

On the 2nd December 2006, Robyn and Hanne (in Paul's boat) went to Kauri Creek, the first visit since August 2004. Although the overall seagrass percentage cover was low, *Zostera capricorni* covered the whole area, and appeared very "burnt". There were also extensive dugong feeding trails throughout. The known dugong pod of about sixty, live only a short distance south from this site.

The following day Robyn and Hanne waded to Poona PN3. While the seagrass cover was very sparse it was still an improvement on August 2004 when the site was almost bare. The interesting fact was the appearance of *Halophila ovalis* in seven quadrats, not previously recorded. A well earned break for everyone until 20th January with a boat trip to BN3 with a very pleasing increase in seagrass cover and a noticeable increase in *H. ovalis*, intermingled with *Z. capricorni* and *Halodule uninervis.* We noticed walking back to the boat that the single *Halophila spinulosa* plant seen back in June 2006 was now a very healthy patch covering several square metres.

The first weekend in February was extremely busy. Gordon, Hanne and Pat surveyed BN1. While the values recorded were down on last June, it appeared that the site was again covered in fine silt to 100 mm deep, as none of the shell and rock previously visible could be seen.

For World Wetlands Day on Saturday 3rd February we had a Seagrass Display stall and I gave an introductory talk, by invitation from Cooloola Coastcare, at Tin Can Bay. Some very innovative displays particularly those opposing the proposed damming of the Mary River and the building of a Marina on the foreshore, at the dolphin feeding area. On that afternoon in a 35 knot gale, Pat and I walked to TB1 at Norman Point, where at least we were able to find the transect markers and site tag, not seen last August, a few leaves of *H. uninervis* were found, but conditions were too bad to do a proper survey.

At the same time Robyn and Hanne visited Poona, PN1 had the best seagrass coverage since 2003, with greatly reduced epiphyte. At PN2 the disturbing feature is the significant absence of animal activity, I suppose the natural follow-on from no grass! The Sunday saw us at Tinnanbar TN1 where the seagrass covers over the first 30 metres were very similar to October 2006.

To cap off a great quarter, the announcement was made that we had won the Burnett Mary Natural Resource Management Award for Coastal Community activity, which I received on behalf of the TEAM.

Community Award for 2007

In February, the Great Sandy Strait Fauna & Flora Watch won the the Burnett Mary NRM Coastal Community Award for 2007. The Award was for excellence in activities that have contributed to the significant improvement of local coastal and/or marine environments, including estuaries, dune systems, wetlands and saltmarsh ecosystems.

Spokesperson for the group, Mr Gordon Cottle said that the group was thrilled to win the award, and that special thanks must go to group members, Robyn Bailey, Paul Bailey, Hanne Larsen and Pat Cottle. "A wonderful achievement for such a small group."

GSSFFW is an active participant of the Seagrass-Watch program, monitoring 18 sites throughout the Great Sandy Strait.

Gordon has been a major force in the program's success in the region. He is also inventor of the "Cottle Corer", a modified seed corer which is used by Seagrass-Watch groups for sampling seagrass seeds.

Seagrass-Watch HQ congratulates Gordon, Pat, Robyn, Paul and Hanne on their wonderful achievement, and tireless effort in monitoring the Great Sandy Strait. A job well done and an award well deserved!!!

Visit by HQ

Above top: Pat, Hanne and Robyn at TN1.
Above center: Gordon and Rudi count seeds.
Above: Len and Hanne at PB1.

On 17-19th March, Len and Rudi (Seagrass-Watch HQ) visited Great Sandy Strait to catch up with Gordon and the GSSF&FW. Tinnanbar sites TN2 and TN3 were monitored by the group on the Saturday, and Pelican Bay site PB1 was monitored on the Sunday with assistance from Hanne.

Seagrass abundance at Pelican Bay was lower than previously recorded, possibly a consequence of significant increases in epiphytic algae and sand movement across the site.

Epiphyte abundance at all sites monitored over the few days were greater than 80%, making seagrass species identification difficult. The persistence of high epiphyte loads is a concern and possibly a consequence of elevated nutrients throughout the region. Further investigation is encouraged.

Noosa River Seagrass-Watch (NRSGW)

Kris Boody (NRSGW local coordinator) reports

This round of seagrass surveys attracted a lot of new Seagrass-Watch volunteers. Due to the demand, three new sites where added to the previous 14 sites already monitored in the Noosa River.

Halophila ovalis patches in Lake Doonella

An area of importance called 'Lake Doonella' was incorporated into the survey with the majority of cover dominated by *Halophila ovalis*. Which is quite uncommon for this river system.

Lake Doonella is an extremely shallow, salt-water lake, forming part of the riverine system. It is the smallest of the main Noosa River lakes and is the one most affected by urban development. The Lake's name might be derived for the Aboriginal word "Dunandella", a small green fruit. The Lake is an important bird habitat, with a number of blackswans, pelicans and cormorants to be observed there from time to time. It is also an important link in the food chain for marine life locally.

Every day you can stand on the bank of the Lake and observe the flock of Black swans (*Cygnus atratus*) harvesting the seagrass with their heads down, shoulder to shoulder. The data has yet to be analyzed but it seems that *Halophila ovalis* was still lower in percentage cover over the whole river than the dominate seagrass species *Zostera capricorni*.

The method of paddling over the deep areas has been refined, producing a high accuracy in the data collected (Thanks Team!!).

In 2007, NRSGW will add temperature loggers supplied by Seagrass-Watch Moreton Bay and a catamaran will be purchased before the next monitoring that is set for June/July 2007.

This program is supported by Noosa Integrated Catchment Association (NICA), through funding provided by SEQ Catchments and the Noosa Shire Council.

The Black Swan, *Cygnus atratus*, is a large non-migratory waterbird which breeds mainly in the southeast and southwest of Australia. Unfortunately, human inhabitance has decreased the population of the swan. The current global population of the Black Swan is approximately around 500,000 individuals.

Seagrasses are a major food for Black Swans that eat large amounts of the rhizomes that run under the mud. As the seagrass passes through the body of the swan some nutrients are absorbed but most passes out of the swan to provide food for a wide range of invertebrates. *Zostera* is the preferred diet for black swans in eastern Australia.

The Black Swan is protected under the Australian National Parks and Wildlife Act, 1974. It is evaluated as Least Concern on the IUCN Red List of Threatened Species.

Seagrass-Watch Moreton Bay

Keira Price and Paul Finn report

Above: Michelle, Simon and Paul at Moreton Banks

Fiona, Josef, and Michelle at Lota, site 2

Jacquie Sheils covered in mud, Ormiston

Leigh, Meryl and Irene at Macleay Island

Above: Keira, Janet and James, Peel Island
Right: Rachael, Dan O'Sullivan and Dan

With the March/April monitoring period upon us the Moreton Bay Seagrass-Watch team are all ready to get stuck in to the first survey period of 2007.

We currently have 134 volunteers who have adopted and regularly monitor most of our 57 sites, collecting data of a very high standard. The overall state of seagrasses in the Bay has been reasonably stable over the last 5 years of monitoring, with fluctuations mainly attributable to seasonal variation. The highest diversity of seagrass is on the eastern side of the Bay where the water quality is better. To thank our volunteers for their hard work we have conducted two enjoyable excursions on the QPWS barge out to Crab Island on the eastern side of the Bay. As well as treating them to a BBQ, the excursions also served as outdoor workshops to improve their plant and animal identification skills.

We have recently placed data loggers at some of our sites recording temperature to see how this relates to seagrass growth and health. A future project we are looking into is sediment monitoring which could be of great use in seagrass rehabilitation trials and monitoring in general.

Hopefully 2007 will be as successful as last year.

Mangroves: sea "trees"

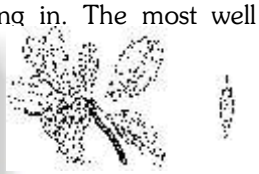
Louise Johns (Fisheries Biologist DPI&F) reports

Seagrasses are not the only marine plants that are important for fisheries. The Queensland Department of Primary Industries & Fisheries is also responsible for protecting and managing mangroves.

Prop roots of the Rhizophora sp.

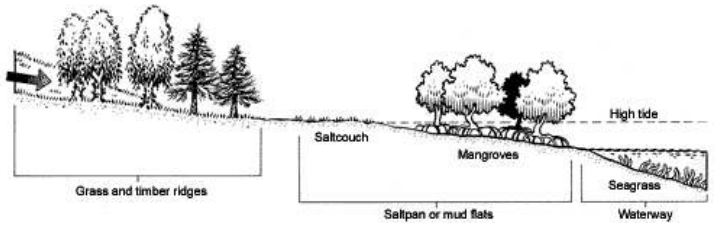
Mangroves are uniquely adapted trees and larger shrubs that inhabit the intertidal area between the ocean and the land. The term "mangrove" actually refers to not only the plant but the tidal habitat and community of plants as a whole. Queensland has around 36 different species of mangroves making it one of the richest biodiversity areas in the world. Most of the mangrove species diversity is in the northern part of the state.

To deal with living in such a harsh environment with salt and silty conditions, mangroves have adapted by modifying their root structure. Mangrove roots vary in structure and shape depending mostly on the local tidal influence and soil type. Root structures range from prop roots (*Rhizophora* sp), peg roots or pneumatophores *(Avicennia* and *Sonneratia* sp) and buttress roots *(Ceriops* and *Brugiera* sp) depending on the wave action and sediment type the plant is growing in. The most well recognisable mangrove is the prop rooted mangroves with big stilts holding it above the ground. This mangrove is called the "red mangrove" or *Rhizophora* species.



Above: Peg roots or pneumatophores, Sandfly Creek, Townsville.
Right: Mangrove trees and pneumatophores on the coast of Yap. Photo by Eric Guinther

The root structure modifications allow the mangrove to grow in quite harsh, unstable environments where there is a lot of silt and mud. Often the roots of mangroves contain structures, called lenticels that allow oxygen movement into the plant compensating for water logged soils that have limited oxygen.



Mangroves occur in the intertidal zone between high and low watermarks

Dealing with excessive salt is another adaptation that mangroves have mastered well. One strategy for dealing with salt are salt excreting glands on mangroves leaves such as in the river mangrove (*Aegiceras sp)*. Exclusion of salt at the root level is another mechanism to reduce salt loads. Some plants like the Cedar mangrove (*Xylocarpus mekongensis*) even drop their leaves as a way of regulating salt levels.

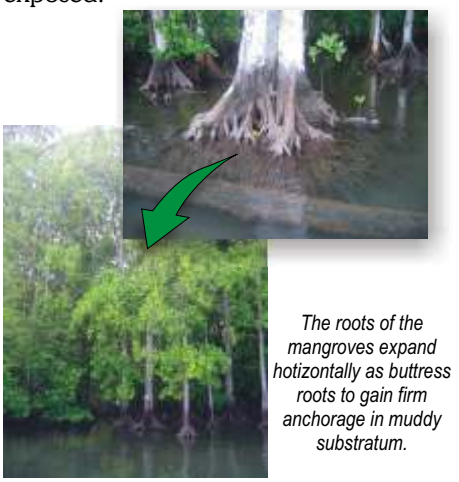
Salt crystals formed on a leaf

Mangroves have one the most unique reproductive strategies of any plant. They have a method of reproduction analogous to the mammals of the animal world, as they produce "live young" or are "viviparous". This means that the seeds they produce germinate on the mother tree prior to release. *Rhizophora* species are champions at vivipary with their long propagules often seen floating around the tidal currents with a couple of leaves shooting off ready to implant themselves in a suitable environment.

Mangroves are known to provide important feeding and nursery areas for a number of different fish and prawn species. The shape and structure of many mangroves provide great hiding places for smaller fish species allowing retreat from larger predators. Nutrient rich sediments around mangroves provide an excellent feeding ground for juvenile fish and prawn on an incoming tide. The mangrove sanctuary and feeding zone, however, may be limited in its availability often being only accessible during high tides. This brings in to play the importance of associated habitats close to mangrove forests. These alternative habitats can vary depending on fish or prawn species size and diet. Seagrass can provide an alternative habitat to juvenile fish and prawns during mid to low tides. Fringing reefs are suitable habitat for juveniles and adults during lower tides when both mangroves and seagrass are exposed.

***Mangrove propagules** can survive desiccation and remain dormant for weeks, even over a year until they find a suitable enviroment. Once it is ready to root, the propagule will change it's density so that the elongated shape now floats vertically rather than horizontally. In this position, it is more likely to become lodged in mud and root. If a propagule does not root, it can alter its density so that it floats off again in search of more favourable conditions.*

Above: Aegiceras corniculatum, River Mangrove, seed



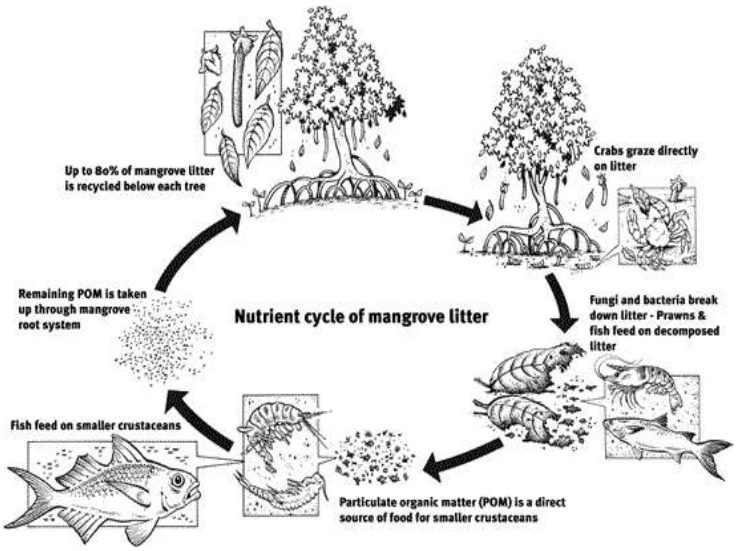
The roots of the mangroves expand hotizontally as buttress roots to gain firm anchorage in muddy substratum.

Mangroves

This complex interaction between habitats is known as a "habitat mosaic". The proximity of these habitats to each other can contribute to the effective value of the area to fisheries. Modifications or degradation of any separate sections of the habitat mosaic can greatly affect the availability of fish and prawn species across the whole mosaic through interruptions of flow.

Mangroves provide shelter and food for juvenile fish of many species. Including commercially important. barramundi, mackeral, king and banana prawns and mud crabs.

Apart from obvious links with fish and prawn species, particularly those that are associated with commercial and recreational fisheries, mangroves also have a tight relationship with a smaller and less widely known crab species. The ubiquitous grapsid crab which includes species such as the fiddler

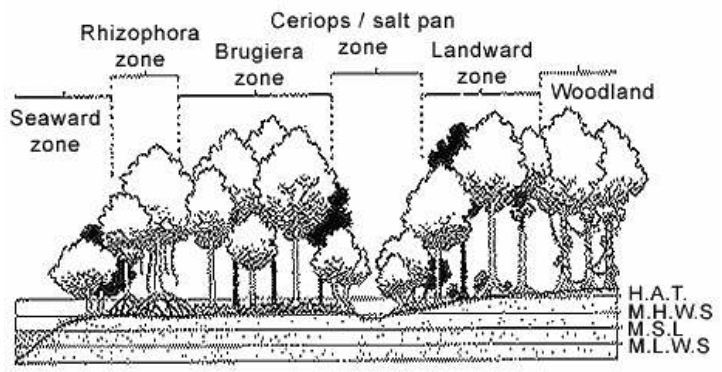


crab and ghost crab, dig large burrows around mangroves which help the mangrove by allow regular flushing of tidal waters to its roots. In return, as payment, the mangrove tree drops its leaves, which the crab consumes. In a healthy mangrove forest there are usually lots of crab holes with little leaf litter visible due to the interaction between these two species. Where there is excessive leaf litter or limited crab holes in a mangrove forest it can often indicate that the ecosystem may be under stress.

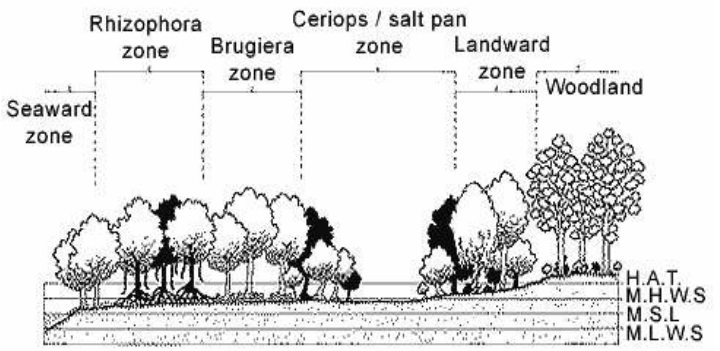
Due to the links between mangroves and fisheries productivity, in Queensalnd (Australia) mangroves are protected under the *Fisheries Act 1994* legislation. The protection applies over all lands regardless of tenure ie private, freehold land, leasehold and state lands.

The long term benefits of protecting mangroves for local and regional fishing depend on ongoing community support. Please play your part in support of these important fisheries management measures.

If you observe any disturbance of mangroves or marine plants at anytime please contact the Queensland Boating and Fisheries Patrol on 1800 017 116 (free call).



A typical mangrove zonation in southern Queensland



A typical mangrove zonation in northern Queensland

Torres Strait Update

Monitoring for 2007 began early this year (25-28th February). This was the first time summer (albeit late summer) monitoring had been conducted. Seagrass percentage covers were very high at all sites examined. Big news is that a fourth site has been established with the Hammond Island rangers, at Corner Beach (HD1) on Hammond Island. Despite the rain and the wind there was a fabulous turn-out thanks to the enthusiasm of Stephen, Francis and the nursery ladies who came prepared with their umbrellas and newly acquired skills in seagrass taxonomy (see page 1). The reeftop meadow at HD1 was a mixture of *Enhalus (EA)*/ *Thalassia (TH)* and *Cymodocea rotundata* (CR). The meadow was extremely dense and observers were very careful not to place their feet in any large mud crab holes.

First monitoring event on Hammond Island.

All other monitoring went according to plan: Kinam and Stacee pulled out all stops to turn up on Sunday afternoon to take in the wonders of Front Beach (TI2). This trip saw some of the highest number of seeds ever encountered in one core at this site 14 whole seeds!!!

Above: Jane and Stacee monitor Front Beach, TI2. Insert: Rudi collects seeds.

Measuring canopy heights. L-R: Horn Is, Thursday Is & Hammond Is.

Back Beach, Thursday Island, TI1: Len, Stacee and Sinitta zooming along transect 3

The following day Back Beach was monitored. The tides were very slow to drop, as a lot of water was being held up on the reef flat by the wind. Consequently, there was a lot of sitting around waiting for the tide to drop. Stacee and Sinitta with assistance from Len (SW HQ) monitored their transect in record time, nearly half the time of other crews. Jake Seaton and Francis Mosby also joined the regular Watchers, and it is hoped to see them out on the seagrass flats again.

Above: The Back Beack, Ti1, Crew!!! Right: Waiting around for the tide to drop.

Green Ambassador Becky Bowie (see issue 27) assisted the Kaiwalagal Rangers in monitoring Wongai Beach (HI1). The meadow was extremely dense with many estimates of percent cover being over 75%. The number of half seeds was also very high. Consequently the high percentage covers may be the result of a lot of seagrass seedlings establishing in the meadow. Maryann was determined not to be lost on the mud flat and certainly brightened our afternoon.

Above: The Wongai beach site, Horn Island, HI1, now being monitored by the Kaiwalagal Rangers (right), who were assisted on the day by, Becky, Sinitta, Stacee and Kinam. Spot Maryann??

Roebuck Bay -Broome Seagrass-Watch

Danielle Bain, Broome Seagrass-Watch local coordinator

The Roebuck Bay Community Seagrass Monitoring Project is about to commence in Broome. It is the first time seagrass in Roebuck Bay will be mapped and monitored for baseline data and the first Seagrass-Watch group to form in Western Australia.

Roebuck Bay, Broome

Seagrasses in the bay area

Lyngbya blown by strong winds into coastal trees

Environs Kimberley (EK), a local environmental NGO and the Department of Environment and Conservation (DEC) are joint managers of the Coastwest funded project, with support from the Roebuck Bay Working Group (RBWG). The RBWG aims to progress management planning for the protection of Roebuck Bay's values through community based management planning.

Roebuck Bay is 66,000 ha, an area way too big for our little group to cover. We decided to focus our attention on the seagrass beds adjacent to the Broome townsite for a number of reasons. Firstly, we know from research conducted in the 1980s that the seagrass beds in this area are fairly perennial. Secondly, the area is very accessible unlike most of the coastline around Roebuck Bay. Thirdly, we are concerned about the water quality coming from the townsite and how it may be affecting the health of the seagrass beds and other marine life. This is due to blooms of *Lyngbya majuscula* (blue-green algae) over the last two wet seasons. The algae has smothered the seagrass at times and appears to cause die-off.

We have picked three sites along a 5 km stretch of coastline, from Town Beach (near the mouth of Dampier Creek) to the Port (situated at the tip of the Dampier Peninsula). We have decided to monitor the sites more frequently than quarterly (which is most common), as we would like to observe changes in the *Lyngbya* if it appears again next October.

Volunteers will follow the methods set out in the Seagrass-Watch manual, recording species composition, seagrass and algal %cover and canopy height. Mapping will be an integral part of the project and particular attention will be paid to the near shore boundary of the seagrass beds at the three sites.

Lyngbya covering seagrass

We are liaising closely with a group of scientists based in Perth who are planning some more intense research in the area to determine the cause of the blooms. The information that will be collected by our volunteers will be extremely valuable in assisting these scientists. We will also have a better understanding of the natural changes in seagrass growth and die-off as the seasons change, providing valuable baseline information.

Rock in Roebuck harbour covered with lyngbya majuscula or blue green algae.

An information session for interested volunteers is being held on 17 March and our first training workshop will be held 2 weeks later. Then we will be ready to head out to the mudflats of Roebuck Bay and begin our first proper monitoring session!

Facts on Lyngbya

Lyngbya majuscula is a marine cyanobacteria (blue-green algae). It is also known by common names such as Mermaid Hair, Stinging Limu and Fire Weed - a name that has caused some confusion in the wider community. Fireweed was the name first given to *Lyngbya* by the Fraser Island community. However, fireweed is a name usually given to a small hydroid with stinging cells, commonly found in the waters of south-east Queensland.

Lyngbya has both toxic and non-toxic forms. It grows attached to seagrass, sea weed, and rocks in clumps or mats of fine, dark cotton wool-like strands 10 to 30cm long. Through the accumulation of gas bubbles mats can rise to the surface to form large floating mats. Floating *Lyngbya* has washed up on some beaches, often mixed with seagrass. Generally fish do not swim in areas affected by *Lyngbya* and tend to leave these areas to find waters which are not affected. The rabbit fish is one exception to this and is often found in large numbers where *Lyngbya* is present.

Scientists are currently investigating the causes of *Lyngbya* blooms. While temperature, light and salinity are factors that contribute to the blooms, other triggers being investigated are iron, organic matter and phosphorus. .

Over exploitation of seagrass meadows in Indonesia: what can research tell us?

Richard Unsworth reports

Seagrass meadows are dominant within shallow tropical marine environments and have local, regional and global biological and economic significance due to the goods and services that they provide. Recently, the cycling of nutrients by seagrass meadows has been highlighted to be of economic importance, but these habitats also provide other vital services such as biological life support, nursery refugia, and sea defences, and play a significant role in the cycling of important gases. Global research efforts have now highlighted that despite their value, seagrass meadows are experiencing an unprecedented level of stress and decline.

Many readers will be aware of this degradation at the local level. It is at a local level that monitoring programs like Seagrass-Watch are helping to reverse some of these declines, particularly in areas where seagrass meadows are threatened by impacts such as nutrient run-off, sedimentation, physical degradation and pesticide leaching. But in many areas of the Indo-Pacific, particularly within small island communities seagrass ecosystems are increasingly under threat from the over-exploitation of their productive fish and invertebrate communities. This exploitation is largely un-documented and thought to be increasing in areas of human population growth. Tropical marine research and conservation often focuses on the exploitation of coral reefs, with many studies documenting the long-term decline in their resources. As inter-tidal and shallow water habitats, seagrass meadows (and mangroves) provide readily accessible and productive fishing grounds, even in poor weather.

Small island communities are dependent on the abundant fauna with seagrass meadows

In Indonesia, in areas such as the highly biodiverse Island of Sulawesi, fisheries management is urgently required. Large areas of reefs and seagrass are increasingly threatened by over-fishing or destructive fishing practices, this is particularly apparent within the Wakatobi Marine National Park (MNP), where marine resource dependence is very high yet the local fishery is unmanaged and overexploited. One of the major impacts on seagrass meadows within the Wakatobi MNP is overexploitation which is now detrimentally impacting on fish and invertebrate stocks. High exploitation rates are widely visible at low spring tide when many hundreds of people can be seen walking across exposed seagrass collecting a range of invertebrate species, mostly for subsistence, but also for commercial export. Seagrass meadows are also vitally important to the local people for their productive fin fisheries, common methods including gill netting, seine netting and small trap fisheries. However, what is now of growing and urgent concern within the region is the increasing use of high intensity fishing methods, predominantly the use of Fish fences (*a non-selective method utilising the tidal movement of fish to trap all individuals on the reef flat/seagrass beds as the tide ebbs*). Fish fences, locally known as '*sero*' have increased twelve fold from 2002 to 2006 within the Wakatobi MNP. In that time their catch per unit effort has steadily declined by over 60%. Regardless of trophic level, most fish in the local fishery are now harvested before they reach sexual maturity, with a large proportion of the catch coming directly from seagrass habitats. Key families fished for subsistence include Lethrinidae (Emporer), Scaridae (Parrotfish) and Siganidae (Rabbitfish), and key invertebrates include gastropods (Strombidae, Cymbiola, and the Cowries) and sea cucumbers. Many local fishermen support the scientific data and believe that these once abundant resources are in decline.

Local Indonesian fishers purse-seine netting at low tide

Abundant mangrove mixed with thick seagrass comprises an important coastal habitat within Indonesia

The importance of seagrass and mangrove are often dismissed within the Indo-Pacific as many researchers have doubted their role as juvenile fish nursery grounds, and suggested that the connections between coastal habitats may not be as important as those found in the Caribbean. But due to their undeniable importance to the fisheries within small island communities and their tragic overexploitation, it was critical that further research be conducted on the importance and ecological functioning of these habitats. Future sustainable management of these coastal habitats in the Wakatobi MNP required a clear assessment of the functioning of seagrass meadows in supporting fish assemblages.

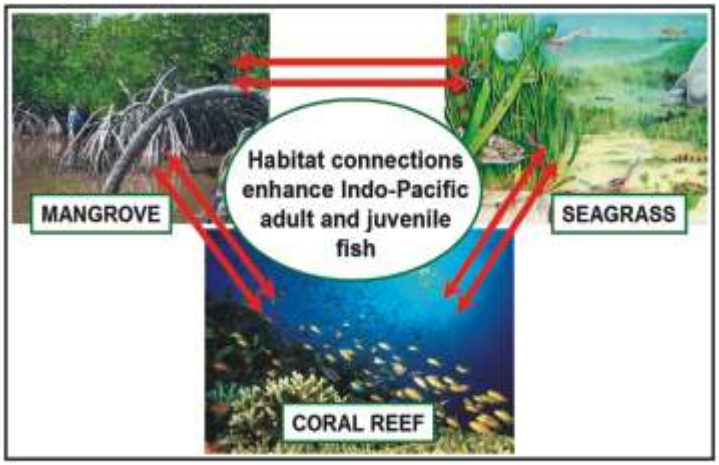
Over the last three years a group from Univesity of Essex, UK, led by myself, and in collaboration with Operation Wallacea has been involved with extensive research on factors controlling faunal productivity in Indonesian seagrass habitats. By conducting a range of assessments within these habitats we have determined that connectivity between seagrass, mangrove and coral reef is considerable. Seagrass meadows were found to contain large densities of juvenile fish, many of which frequent reef and mangrove habitats; whilst at night large numbers of

Seagrass fish sampling in the Wakatobi MNP, Indonesia

predatory fish enter the shallow water environments to feed on abundant crustaceans and small fish. A key control on seagrass assemblages was found to be adjacent mangrove habitats that act as important feeding grounds for seagrass and reef fish. We also found evidence that suggests mangrove provide an important source of organic matter to the seagrass food web, stimulating a diverse and abundant fish fauna.

We have documented an alarming decline of a seagrass fishery

in a five year period that provides an important example of how seagrass habitats within parts of the Indo-Pacific are clearly under threat from over-exploitation. Indo-Pacific seagrass conservation is therefore an important component of coastal marine management. This is particularly true in the light of our research that suggests coastal marine habitats are highly connected component parts of a larger ecosystem within which the fauna as well as the energy provided by primary production freely moves around. With high inter habitat connectivity overexploitation has the potential to have cascade effects on nearby reef and mangrove communities, hence future management of these systems must take an ecosystem level approach that considers all component habitats including seagrass, mangrove and coral reef.



Habitat connections have been found to be very important for seagrass fish assemblages

Seagrass -Watch and the Motupore Island Marine Biodiversity Unit (PNG)

By Jane Wia, Research and Training Officer

The final survey for last year was completed in late January and we are happy to report that the seagrass seems to have recovered quite well since the last survey. The seagrass species that were

most affected during the period of extreme low tides last year were *Enhalus acoroides*, *Thalassia hemprichii*, *Cymodocea serrulata* and *Cymodocea rotundata*. The other species which are; *Halophila minor, Halophila ovalis, Syringodium isoetifolium, Halodule uninervis, and Halodule pinifolia* exhibited more resilience. All seagrass species has have since recovered well with much regrowth.

In our efforts to increase our seagrass survey sites, we have established contact with two communities that have expressed interest in assisting with monitoring. We will be visiting these communities soon to conduct general awareness programs on the importance of marine biodiversity and conservation and as part of this, the importance of the seagrass ecosystem. At the

Rickson and Eddie recording data

moment, we intend conducting the surveys ourselves but we hope to involve the local villagers should they wish to be directly involved. One of the main benefits of involving the local communities is that this should ensure that the markers for the monitoring sites remain intact.

Motupore Island Research Centre

MIRC is the only dedicated marine and coastal research support unit in Papua New Guinea. Developed by the University of Papua New Guinea (UPNG), MIRC is able to support and develop research initiatives in many disciplines.

MIRC is based at Bootless Bay off the East Hiri Coast some 15km SE of Port Moresby, the capital and international port of entry to Papua New Guinea. Motupore Island is within the Papuan Barrier Reef, the lagoon of which is a submerged ancient coastal plain whose outer margin is defined by an impressive reef some 5km offshore, paralleling the PNG coast for many kilometres to the SE. The small hilly island of Motupore is c. 800 m by 280 m, covering 45 acres.

Most tropical marine habitat sites are present between Motupore Island and the barrier reef, including a variety of reef types [fringing, patch and barrier], seagrass meadows and algae beds, mangroves and extensive intertidal and sublittoral carbonate and mud areas. The terrestrial vegetation is mainly eucalypt savannah, but with pockets of monsoonal woodland and a limited strand formation. The substantial amount of research in the last 3 decades that has been undertaken on and around Motupore and its adjacent environment makes it one of the most studied sites in PNG.

Seagrass-Watch HQ News

Virtual herbarium

In March, Seagrass-Watch launched it's own and possibly one of the world's first, Virtual Herbarium for seagrasses, made possible with the assistance of the Australian Government's Marine and Tropical Sciences Research Facility (Department of the Environment and Water Resources) represented in North Queensland by the Reef and Rainforest Research Centre (RRRC), and the Queensland Department of Primary Industries & Fisheries.

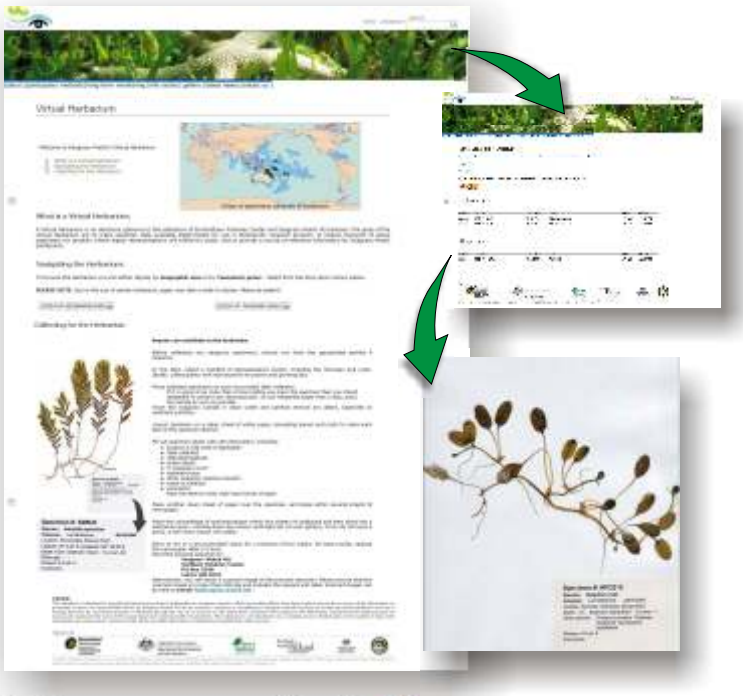
This Virtual Herbarium is an electronic gateway to the collections of the Northern Fisheries Centre and Seagrass-Watch HQ herbariums. The goals of the Virtual Herbarium are to make specimen data available electronically for use in biodiversity research projects; to reduce transport of actual specimens for projects where digital representations will suffice for study; and to provide a source of reference information for Seagrass-Watch participants.

In this initial phase, users can browse the Herbarium and display specimens either by Geographic area or by Taxonomic genus. In the future (phase 2), users with be able to conduct more specific searches of the herbaria. Most specimens in the Herbarium are from the western Pacific region, although specimens from other countries are encouraged.

Anyone can contribute to the Herbarium. Just follow the simple instructions available on the website, and then send the scanned images to Seagrass-Watch HQ (hq@seagrasswatch.org) and store the original specimen in a recognised herbarium (e.g., a local university).

It is also hoped that in future, the Seagrass-Watch Virtual Herbarium will be linked to other global herbariums via the World Seagrass Association.

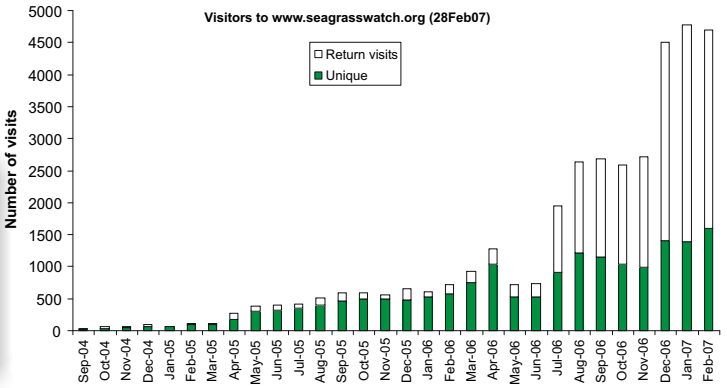
You can browse the Virtual Herbarium at http://www.seagrasswatch.org/herbarium.html.



E-bulletins & Website

Late in 2006, due to many requests, Seagrass-Watch HQ introduced E-bulletins to registered participants and interested internet forums. E-bulletins are emails which include news stories from across the globe on seagrasses and seagrass related issues. The e-bulletins also inform Seagrass-Watch participants of any significant updates to the Seagrass-Watch website, including: news, gallery pages, sampling dates, training workshops, new publications, and giveaways. If you do not currently receive E-bulletins and would like to, please register on www.seagrasswatch.org.

The Seagrass-Watch website has continued to gain in popularity and gone from strength to strength. With the addition of E-bulletins, the program has seen an increase in new and return visitors to the program's website. Participants and visitors are keen to see what's new on the gallery and latest news pages. With around 1500 unique visitors to the site every month, it has proven to be as one of the most effective tools to educate and inform people about seagrasses and the Seagrass-Watch program.



Seagrass-Watch

Do you want to get Involved?
Register with Seagrass-Watch HQ
www.seagrasswatch.org

VOLUNTEERS NEEDED

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Layout & graphic design: Rudi Yoshida & Len McKenzie

Any comments or suggestions about Seagrass-Watch or contributions to newsletters would be greatly appreciated.

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