



Issue 9.1 - March 2006

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Introduction

It's been a great start to the year with some fantastic diving weather which many clubs have taken advantage of to take part in training and monitoring dives.

The first newsletter of the year has taken a little while to come out, but there's plenty inside: forthcoming events for Reef Watch (put the 8th June in your diary!), and other events of interest; reports on past events, including a summary of the Marathon Dive and all the Reef Watch fish data for Noarlunga Reef; requests for information about marine species and other articles about our marine environment.



If you currently receive this newsletter in the post and would prefer to receive it by email then let us know at info@reefwatch.asn.au. If you do not have access to the internet and need help obtaining any on-line reports or other information we refer to in this newsletter, call us on 8223 5155 and we'll mail you a hard copy.

Reef Watch Annual General Meeting

It has actually been a few years since the last Reef Watch AGM – or any sort of forum to discuss the program! We will therefore be holding an AGM on:

Thursday, 8th June, 2006, at 6.30pm.

This will precede a Reef Watch talk on intertidal monitoring at 7.30pm.

The venue will be finalised over the next few weeks. The next issue of Reef Watcher will not come out until after the AGM, so if you are not on our email list but you wish to receive agenda papers and/or attend the event, please contact Reef Watch on 8223 5155 or via info@reefwatch.asn.au

Intertidal Monitoring Update – and Forthcoming Public Lecture

After a successful summer of workshops and information sessions we have now entered the winter season. However, things don't stop just because it is cold and tides are not low enough. Our aim over the coming months is to progress with the monitoring program so that when summer arrives, everyone is ready and equipped to get out there. We intend to make kits available for interested groups; these kits will include all the necessary equipment for all methods, survey instructions, identification manuals and maybe some books. We will also be setting up a database for online data entry and reporting.

The coming months can still be spent on information and species identification sessions and some training with the methods. Please contact me if you are interested. The first of these sessions will be on Sunday, May 13th, at 9.30am, for people interested in monitoring Aldinga Reef. See the section on monitoring at Aldinga Reef elsewhere in this newsletter for background about this session.

Agnès Cantin, Reef Watch Intertidal Project Officer
agnes.cantin@flinders.edu.au, 8223 5155, 0427 183 734).

There will be a public lecture on the importance of intertidal rocky shores and monitoring, with an overview of the Reef Watch Intertidal Program, by Professor Peter Fairweather, Kirsten Benkendorff and Agnès Cantin, on:

Thursday, 8th June, 2006, at 7.30pm

The next issue of Reef Watcher will not be out until then, so contact Agnes if you wish to attend but are not on the Reef Watch email list.

Blue Groper Expedition

The next Blue Groper Scientific Expedition will be taking place on Eyre Peninsula some time after Easter. This may well be the last such expedition, simply because there's not much of the coast left to cover!

In the past, these expeditions have been organised by Reef Watch in conjunction with Dr. Scoresby Shepherd. You can find information and photos that will give you an idea about the trip, on our website, <http://www.reefwatch.asn.au/blueGroper.html>

However, on this occasion, Reef Watch will be unable to provide suitable personnel to accompany the expedition. Therefore Dr Shepherd will be taking responsibility for the organisation of the trip. If you wish to take part or want to make further enquiries, you can contact him on 8207 5455 or Shepherd.Scoresby@saugov.sa.gov.au.

PLEASE NOTE THAT REEF WATCH IS NOT INVOLVED IN ANY WAY IN THE ORGANISATION OF THIS ACTIVITY AND THEREFORE TAKES NO RESPONSIBILITY FOR PEOPLE WHO TAKE PART. YOU DO SO AT YOUR OWN RISK

South Australian Underwater Photography Society Meeting

The next meeting of the SAUPS is at 7.30pm on Thursday, 27th April at S.A. Photographic Federation, 260 Portrush Rd, Beulah Park. Richard Harris and Neville Skinner will share some of their diving adventures on Vanuatu Ship Wrecks Reefs and SA Sinkholes respectively.

Come along and see photos of crazy critters, rusted hulls and crystal clear waters. Dream about your next holiday, chat about UW pics..... or just join us to enjoy the underwater scenery over some drinks and nibbles.

Everyone welcome – gold coin donation. RSVP to David Teubner, President SAUPS (dteubner@msn.com.au) Is preferred for catering but if you forget just show up.

Reef Watch Dive Program

We have a full dive program for the rest of autumn, covering the Metro area as well as Fleurieu Peninsula, Yorke Peninsula and Kangaroo Island. Reef Watch divers are welcome on most club dives, but need to let us know their intentions.

The dives on the following pages are taken from the Reef Watch website ("Next Dive" quick link). Dives are subject to change, so for the most up-to-date information, visit the website or contact Reef Watch on 8223 5155 during office hours, or close to or on the day you can call the Reef Watch Information Line, 0418 898 302 in case of changes due to the weather or unforeseen circumstances – it is always a good idea to do this before departing home for a dive.



Photo: Thierry Laperousaz, SA Museum

Saturday, April 22, 2006	Glenelg Scuba Diving Club	Port Noarlunga Meet in car park at 9am. For training dives.
Tuesday, April 25, 2006	Underwater Explorers Club of SA (UEC)	Broken Bottom UEC club dive only unless you have your own boat.
Saturday, April 29, 2006	Public Dive	Kangaroo Island Public Snorkel 29th & 30th - location to be advised
Saturday, May 06, 2006	Public Dive	YORKE PENINSULA Saturday 6th AND Sunday 7th. There will be two dive/snorkel Reef Watch training sessions at different sites on Yorke Peninsula (possibly Edithburgh and Point Turton, but dependent on weather).
Sunday, May 07, 2006	Southern Ocean Divers Social Club (SODS)	Port Noarlunga Meet at car park 9am.
Saturday, May 13, 2006	British Sub Aqua Club Adelaide (BSAC Adelaide)	Second Valley Meet in 2nd Valley car park at 9.30 am.
Sunday, May 14, 2006	Fleurieu Dive Club	Oliver's reef, Victor Harbor Meet at Spot on Fishing at 9am.
Sunday, May 28, 2006	Marine Life Society of SA (MLSSA)	Hallett Cove Meet in car park by SLSC at 9.00am We will be able to ferry equipment to the reef at the northern end of the beach using 4WD. All non-MLSSA divers welcome to participate in monitoring or training but please contact Reef Watch before the day.
Sunday, June 04, 2006	Southern Ocean Divers Social Club (SODS)	Port Noarlunga Meet at car park 9am.

DEH Coast and Marine Seminar Program – 2006

Wednesday 12.30 - 1.30pm: Department for Environment & Heritage, Coorong Boardroom, Level 1, 1 Richmond Road, Keswick (just west of Anzac Highway).

26th April

Cath Kemper & Ikuku Tomo (Senior Curator of Mammals, SA Museum / Scientific Researcher, Adelaide Uni - SA Museum) – *Noodle worms in dolphins: conservation implications for Gulf St Vincent.*

31st May

Dr Bronwyn Gillanders (University of Adelaide) – *Population structure and movements of the giant Australia cuttlefish.*

28th June

Brad Page (Research Officer, SARDI – Aquatic Sciences) – *Resource separation among male, female and juvenile New Zealand fur seals.*

26th July

Sue Gibbs/Alison Wright (Macquarie University – SA Museum/ Senior GIS Officer, Coast and Marine Conservation Branch) – *Aerial dolphin survey in Spencer Gulf.*

30th August

Rosemary Paxinos (Project Officer, Marine Planning, Coast and Marine Conservation Branch) – *Marine Planning update.*

27th September

Brett Pendlebury (Senior Ranger/Adelaide Dolphin Sanctuary) – *Adelaide Dolphin Sanctuary.*

25th October

Michael Breen (Coast and Marine Conservation Branch) – *Mammal Interaction Policy.*

29th November

Liz Barnett (Senior Project Officer, Estuaries Policy, Coast and Marine Conservation Branch) – *Estuaries Action Plan*

SARDI Open Day Report

Reef Watch had a stall at the South Australian Research and Development Institute (SARDI) Aquatic Sciences laboratories at West Beach. More than 3,500 people visited, most of whom had a strong interest in aspects of marine research relating to recreational fishing. However, the Reef Watch stall was a destination for the enthusiastic younger visitors, who took their parents around the stalls on a "treasure trail" of questions and clues. Overall, it was a valuable day for getting out information to the public.

Reef Watch Marathon Dive Report

On March 19th at Port Noarlunga, 40 divers and snorkellers took part in the annual Reef Watch Marathon day. 6 sites were monitored on the day, each site being dived twice. Data from the dives was then entered directly on-line at an on site computer terminal. Divers and snorkellers were taken to monitoring sites by boat and after the dive were well fed with a huge BBQ. Training also took place and several divers completed their Reef Watch training and were certified with the P.A.D.I. Reef Watch survey diver specialty.



The Reef Watch display generated a high level of interest from passers by. Channel 10 reported the event on the news that night saying:

Although the Noarlunga reef is a very popular site with divers there are big problems with the reef. If nothing is done to correct problems such as land based pollution, stormwater and effluent, the reef will soon be dead. The community is taking a proactive approach in monitoring the situation and it will need a partnership between the Government and the community to save the reef.

A big thankyou to all the divers and volunteers who made this year's Marathon another great success. A special thankyou to our two boat drivers Mary-Anne Stacey and Robert Rath.

Results from Noarlunga Reef Fish Surveys

There have now been six Marathon Dives since 2000. The most abundant species or species groups observed during these events were, in order of decreasing numbers:

Illustrations (not to scale) are from "Sea Fishes of Southern Australia" by Hutchins, B & Swainston, R (used with permission from Swainston Publishing, Perth).



Hulafish	12391
Bullseye	2364
Leatherjacket	1670
Sweep	1624
Drummer	812
Magpie Perch	507
Old Wife	505
Moonlighter	447
Western Talma	438
Goat Fish	380
Long-Finned Pike	280
Dusky Morwong	191
Wrasse	186



While the number of many species surveyed fluctuated from year to year, there were trends observed for several species groups, including wrasse, bullseyes and leatherjackets. For each of these groups there are two graphs shown on the following page: the graph on the left shows the average number of fish sighted per 50m transect for the Marathon Dives, and the graph on the right shows the average number for all Reef Watch fish surveys. This latter graph includes the two scientific studies performed for the EPA in:

- 2005, by Adelaide and Flinders Universities (Cheshire, A.C., Hall, S., Havenhand, J. and Miller, D.J. (1998). *Assessing the status of temperate reefs in Gulf St Vincent II: survey results*. A report to the Environment Protection Agency of SA – available on Reef Watch website under Reef Monitoring – Reports section)
- 2006, by SARDI Aquatic Sciences (unpublished data provided by Dr. David Turner).

The vertical lines through each data point (“error bars”) give an indication of the variability in the number of fish between all of the transects during a particular year.

For the three species groups, we can observe that:

- numbers of wrasse per transect have consistently been around one fish per transect for the last decade. The only outlier is for 1999, where there were only a few Reef Watch surveys, and the error bars suggest that the data could fall within the normal pattern anyway;
- numbers of bullseyes per transect show a steady increase over the last decade and;
- numbers of leatherjackets per transect have declined since 2000, although the longer term data set shows that they had been at a peak for the past decade at that time.

While absolute numbers of fish present on a reef may change over time there are other factors which may affect the number of fish sighted on a transect. Poor visibility is known to cause underestimates of fish numbers because some species tend to avoid open habitat in such conditions. The visibility during the last two Marathon Dives was lower than in previous years, although it was quite good for half of the 1996 scientific surveys (pers. comm., Dr. David Turner, SARDI Aquatic Sciences).

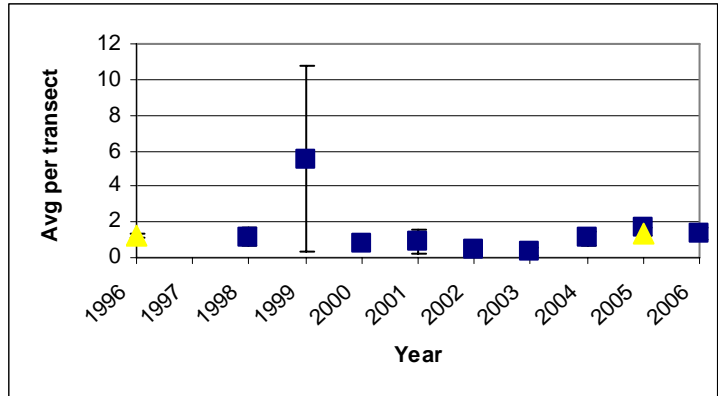
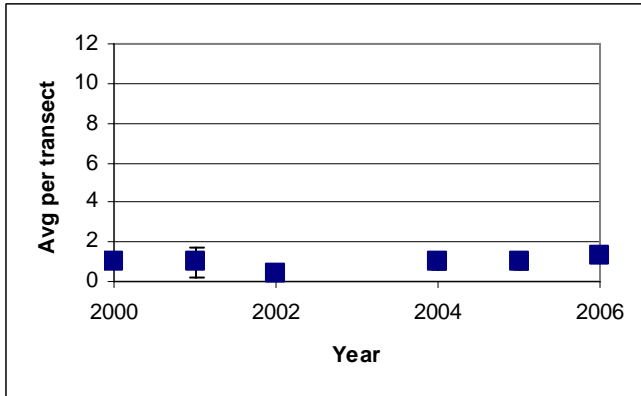
Differences in the way that transect surveys are conducted over time may also affect estimates of fish numbers. Recent fish counts may have overestimated the number of fish present because the scientific survey from 2005 and the Reef Watch 2006 data were collected using a transect of five metres width rather than three metres, as had been the case in previous years.

Fish Survey Data for Noarlunga Reef – Graphs of Selected Species

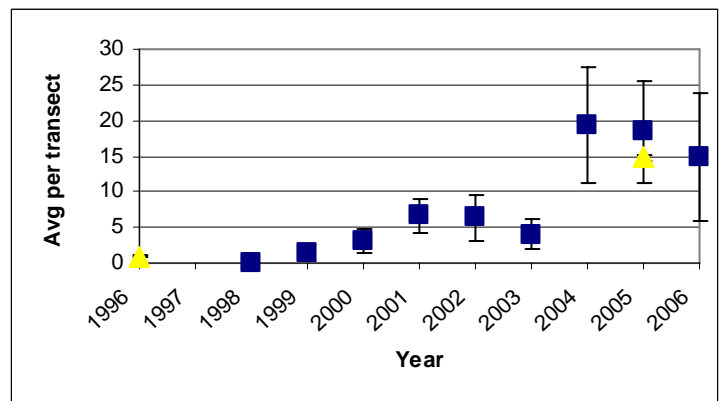
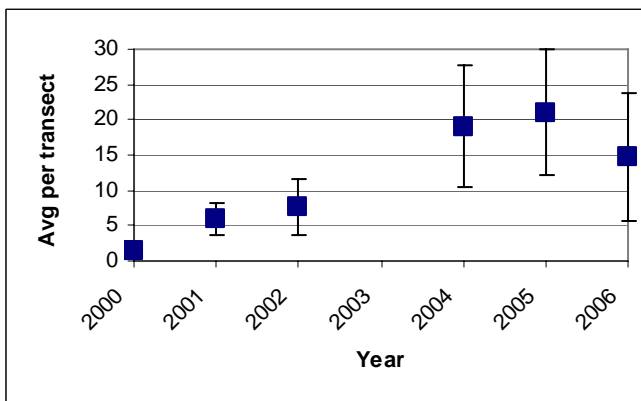
Reef Watch Marathon data, 2000 to present (dark squares)

All Reef Watch data, 1998 to present (dark squares), and scientific surveys from 1996 and 2005 (light triangles).

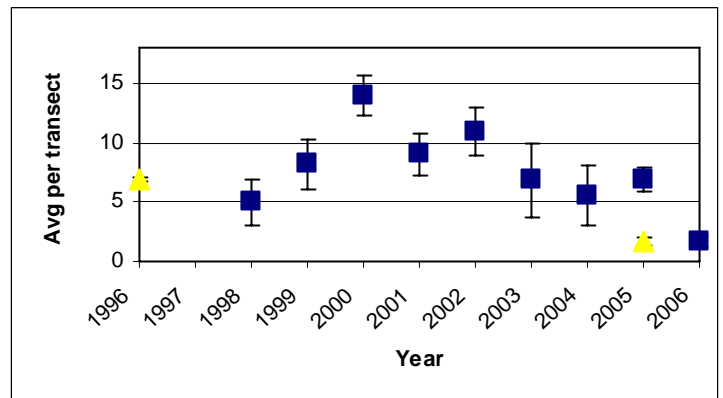
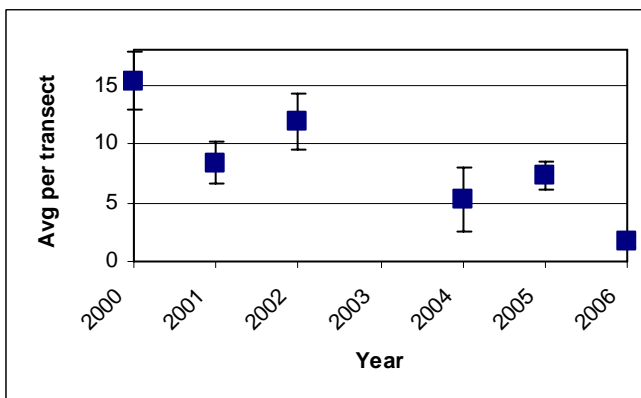
Wrasse



Bullseyes



Leatherjackets



The main messages that emerge from the data presented above are that:

- there is consistency in the trends of numbers of fish per transect between surveys conducted by Reef Watch divers and those conducted by scientists;
- long term data collection (data collected over as many years as possible) is essential for estimating changes in fish populations over time; and
- long term trends in the relative abundance that have been observed for leatherjackets and bullseyes, along with other species, require further investigation to understand the linkages to possible environmental or anthropogenic (human) causes.

About Leatherjackets

Leatherjackets of southern Australia are almost all endemic to the region, i.e. are found nowhere else. They can be divided into three groups, according to their ecology: shallow reef dwellers, deep reef/sponge garden dwellers, and seagrass dwellers, although the juveniles of many reef dwelling species and the adults of some such species, can also be found on seagrass beds. It would be unusual to find an area of reef or seagrass along the southern coastline of Australia without at least one species of leatherjacket present.



Horseshoe leatherjacket with background of brown leathery algae (the kelp *Ecklonia*).

The main identifying characteristic of the leatherjacket is the single spine on the top of the head, usually above the eye. The spine can be raised and lowered when required, and can be locked erect by a second very small spine hidden in tissue just behind the base of the main spine. In most leatherjacket species, there are large differences between females and males, with the former typically having the shape and colour of the juvenile (although there is no evidence of sex change from female to male, as for wrasses and the harlequin fish). Females and juveniles tend to have deeper bodies and with more rounded fin shapes, while males are more elongate and with concave fin profiles. The more slender body and longer fins improve the swimming performance of the male; this is believed to be important for courtship behaviour. Another feature of courtship is that many leatherjackets use the set of spines (typically four or six, arranged in two rows) to fight other leatherjackets, in a side-swiping manoeuvre.

The sex ratio of leatherjackets is approximately one to one, with some species (such as the Yellow-striped Leatherjacket) pairing up for life. Divers often sight one partner first, but the other one is never too far away. Others, such as the Spiney-tailed Leatherjacket, form small harem groups, with the males escorting a group of females and juveniles. The Six-spined Leatherjacket come together in large schools for mating, but spend the rest of the year either in small aggregations of as individuals. Leatherjackets generally produce large numbers of eggs which are fertilised externally by the male. For a few species this takes place during autumn, but most spawn later in the year.



Yellow-striped leatherjacket and Spiney-tailed leatherjacket with background of brown branching algae

Most leatherjackets have a varied diet that includes small crustaceans, worms, bryozoans, ascidians and various algae, even though some are more specialised as herbivores or carnivores. Some divers may bear the scar of a carnivorous leatherjacket (the author received his biggest nick on Noarlunga Reef).

A number of leatherjackets are being included in a forthcoming report on Marine and Estuarine Fishes and Elasmobranchs of Conservation Concern in South Australia, for various reasons, including:

- The edible leatherjackets (usually the larger reef species) are fished recreationally by anglers, charter boats, and spear fishers, and the total recreational catch in each southern State ranges from tens of thousands to hundreds of thousands of specimens per annum. In most parts of southern Australia, there are very few restrictions on the recreational catch of leatherjackets, and the lack of bag, boat and size limits is promoted within the recreational fishing community as a good thing. There is a common perception amongst fishers that, because some leatherjackets take baits set for more desirable species, they are a "scourge" that should be removed from the sea in large numbers
- Most of the large reef species may have a low resilience to exploitation
- For almost all leatherjacket species, very little is known of the biology, population sizes / relative abundance, population dynamics and ecology

The following leatherjackets have been recorded on Reef Watch surveys.

Species	Total count prior to 2004	Total count since 2004
Horseshoe Leatherjacket	196	204
Yellow-Striped Leatherjacket	0	158
Spiney-Tailed Leatherjacket	229	11
Blue-Lined Leatherjacket	359	0
Six-Spined Leatherjacket	462	2
Bridled Leatherjacket	198	0
Toothbrush Leatherjacket	108	0
Velvet Leatherjacket	63	0
Brown-Striped Leatherjacket	2	0
Degen's Leatherjacket	3	0
Other Leatherjackets	547	304

The number total count for each species of leatherjacket observed is split into two columns in the table above, for the years prior to 2004, and for the subsequent years. This is because the identification slate changed at the beginning of 2004. The first version of the slate featured illustrations of the first eight species listed in the table, with the exception of the yellow-striped leatherjacket, for which there were no sightings prior to 2004. The revised slate illustrated only the two species that could be most easily identified regardless of sex, namely the Horseshoe Leatherjacket and Yellow-striped Leatherjacket. The table above reveals that almost no sightings were recorded of those leatherjackets not shown on the identification slate that was current at the time of the survey. Leatherjackets that could not be identified to species were able to be recorded, on both slates, as "Other Leatherjackets".

Sources:

Andrew, N. (ed.), 1999. *Under Southern Seas – The Ecology of Australia's Rocky Reefs*, UNSW Press.

Baker, J. (2006 in prep.) *Status of Marine Species at Risk in South Australia: Technical Report – Bony and Cartilaginous Fish*. Report and CD prepared for the South Australian Working Group for Marine Species of Conservation Concern. Coast and Marine Branch, S.A. Department for Environment and Heritage (DEH), Marine and Coastal Community Network of S.A. (MCCN), and Threatened Species Network (TSN). To be published by Reef Watch, Conservation Council of South Australia. 870p.

Port Rickaby Snorkel Day

The cooling waters of Spencer Gulf did not deter dive enthusiasts from getting into calm and clear seas on March 25th, to learn about the diversity of fish species that rely on and contribute to our precious reef systems.



Ten snorkellers arrived at Port Rickaby keen to explore the underwater world. Before entering the water, they were shown a DVD of the most common fish found in the temperate waters of the Gulf. Reef Watch instructor Steve Leske ran the session and displayed images of Trevally, Silver Drummer, Zebra Fish, Globefish and the Leafy Sea Dragon.

All participants were given an underwater chart with colour images of fish-to help with identification.



Once in the water, snorkellers observed Magpie Perch, Dusky Morwong, Moonlighters and Leatherjackets. Although no Leafy Sea Dragons were sighted on the day, it is hoped that the next dive and snorkel session, at Kleins Point, Edithburgh and Point Turton, may reveal more!

The Northern and Yorke Natural Resources Management Board is proudly supporting and funding the unique Reef Watch Program. If you are interested in future dives or snorkel



Government of South Australia
Northern and Yorke Natural Resources Management Board

sessions, please get in touch with Cherie Heyes at the PIRSA Kadina Office on 8821 1555 or heyес.сherie@saugov.sa.gov.au. You can also check out the Yorke Peninsula section of the Reef Watch website (www.reefwatch.asn.au/yorkes.html).

People of all ages and experience are welcome. The next sessions are planned for the 6/7 May, subject to weather conditions.

Reef Monitoring by DEH on Yorke Peninsula

In 2005, the Department for Environment & Heritage (DEH) Coast & Marine Conservation Branch, in conjunction with SA Research & Development Institute (SARDI) Aquatic Sciences, conducted surveys of the marine fish, invertebrate and plant populations on a variety of Yorke Peninsula reefs (see map overleaf). These surveys are being repeated by DEH in 2006, and some new sites will be added, including Port Victoria and probably Port Rickaby.

The methods used are equivalent to those used by the Reef Watch program, which provides the opportunity for the community to be involved in monitoring of the Yorke Peninsula reefs..

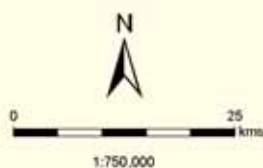
Reef Health Program Survey Locations

Yorke Peninsula Region

Summer 2005

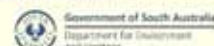


- Reef Health Survey Sites
- Major Towns
- Minor Towns
- Coastline
- Aquatic Reserves
- Built Up Areas



Produced by Coast and Marine Conservation Branch
 Department for Environment and Heritage
Source Aquatic Reserves - FIRSA
 Topographic data - DEH
Projection Lambert Conformal Conic
Datum Geocentric Datum of Australia, 1984
Compiled January 2006

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Seadragon and Pipefish Protection – a Collection of Views

Following the adoption of the Leafy Seadragon, at that time already protected under the *Fisheries Act 1982*, as the state marine emblem, the Marine Life Society of SA (MLSSA) shifted its focus to the unprotected Weedy Seadragon. Their view was that the protection of “Leafies” may inadvertently create more interest in “Weedies”, making the latter more vulnerable.



Photo: David Muirhead
MLSSA

Philip and Margaret Hall, on behalf of MLSSA, were invited to a community meeting last September to voice any concerns they may have had to the relevant Ministers. At this meeting the Premier announced that legislation would be enacted to protect the Weedy Seadragon because of representations by the Marine Life Society.

It is not clear what then led to the protection of all Syngnathids (seahorses, pipefish and seadragons). The press release from Minister McEwen cited a report by the Australian Institute of Criminology that concluded seahorses are vulnerable to organised criminal exploitation and without adequate controls, the viability of stocks may be placed in jeopardy. The Minister stated that *“the species found in South Australian waters are not heavily sought after for this trade, but that conservationists are concerned that over-exploitation of Syngnathids in tropical waters may cause a shift in focus to local temperate waters”*.

No doubt there are conservation groups with such concerns, but they are not the only views.

Local scientist Dr Robert Browne has been undertaking fantastic work towards the conservation of Syngnathids and other inshore demersal fish, in conjunction with Reef Watch enthusiast Kevin Smith, among others. Robert’s website, www.bioteck.org, documents his work and states that a likely source of future threats to Syngnathids and other inshore demersal fish could come from introduced competitors, through changes in vegetation structure due to introduced plants, and climate change.



Sawtooth Pipefish
Photo: Kevin Smith

Concern has also been expressed in other quarters over loopholes in the protection, through permits for collection. In the late 1990s over seventy male leafies with eggs were legally collected through permits from the popular dive sites of Fleurieu Peninsula over a three year period. Pressure from a coalition of researchers and organisations led to the current arrangement where collection is permitted by only one experienced aquarist, for hatching. Nevertheless, there are still concerns that this collecting may be concentrated at a few locations, and that the animals are re-released to the wild with associated quarantine/disease risks. In the last two and a half years there have been permits for four leafies, eight weedies, 40 seahorses (various species) and 20 pipefish, taken from South Australian coastal waters excluding aquatic reserves and excluding waters within one nautical mile of the jetties at Rapid Bay and Second Valley. (pers. comm., PIRSA Fisheries).



Photo: James Manna

Apart from this issue, there are some frustrations for people who have been involved in collating relevant information on the conservation status of Syngnathids and other marine species of conservation interest. Many of the pipefishes, the seahorses and certainly the two seadragons (according to more than 10 years of data) appear to be relatively widespread, some species of pipefish even very common/highly abundant.

Robert Browne's website states that:

[c]onservation regulations providing for the blanket protection of genera or families can be counter-productive through hindering community participation in research. As shown in this study, some species of pipefish have been previously considered as endangered are probably widespread and secure, and other easy to find species have not been recognised."

There may be practical reasons for protecting an entire family (e.g. to avoid issues of misidentification and to facilitate compliance), but they have not been communicated by PIRSA, whose brochure states only that "*the uncertainty regarding the conservation status of many syngnathids warrants an increased level of protection for this group of marine fishes*".

The idea of precautionary protection for data deficient species is certainly meritorious, but the focus on Syngnathids may not take into account some other priorities for protection, such as Blue Groper, Harlequin fish, Rock Ling and a number of conger eels.

Later this year, Reef Watch will be publishing a major report on the conservation status of marine and estuarine fishes and elasmobranchs (sharks and rays) of conservation concern, authored by marine ecologist Janine Baker, which brings together an enormous amount of information about more than 250 species, and should also make a vital contribution to future decisions on protection of marine species.

Therefore, in summary, although MLSSA are to be congratulated on their successful lobbying, and the protection of additional marine species is welcome, it is important that Government does not consider the “marine species protection” box to be ticked for this decade, and it would be reassuring to know that use will be made of all information available to prioritise future species for protection.

If you have any further views on this issue, we would be delighted to publish them in the next edition.

Sources:

- MLSSA Newsletter, Number 331, April 2006
- Robert Browne’s website, www.bioteck.com
- Press Release from Minister Rory McEwen, February 16, 2006
- Various emails from Reef Watch participants
- Personal communication, PIRSA Fisheries

Dirty Business for the Friends of Gulf St Vincent

from Blue Swimmer, Issue 5, March 2006

A number of Friends of Gulf St Vincent members have been flagging recent sedimentation and turbidity issues which is timely given the Adelaide Coastal Water Study results promoted during the “Know more about your Gulf” forum held late last year.

Outer Harbour

You may recall that the Friends of Gulf St Vincent made a submission to the Development Assessment Commission regarding dredging at Outer Harbor and the potential impact offshore dumping of the dredged material would have in terms of spreading *Caulerpa racemosa* and upon unique Gulf ecosystems such as the Orontes Bank.

Since dredging operations began public concerns have been heightened given the visual impact of the sediment that has been churned up (see photos) and speculations that undertaking this harbour deepening has impacted upon fish.



Sedimentation at Outer Harbor Photo: Shaun Corigliano

Maslin Beach Flow of sediment into the sea has been occurring at Maslin Beach, which is possibly the result of misguided management whereby a channel was cut to the sea and the seaward face was reshaped.



A river of silt entering Maslins Beach – photo courtesy of John Houlahan

Torrens outlet

Other “gunk” comprising of blue-green algal blooms, which are known to release toxins, has recently been seen flushed out through the Torrens River outlet, raising health concerns among local residents. Prior to the Torrens River being opened to the sea a system known as the Reedbeds would have assisted in filtering out any “nasties” before it reached our Gulf.

Several public meetings have been held in relation to these somewhat contentious issues and Friends of Gulf St Vincent have endeavoured to attend these and provide an objective view on the issues and management of threats.

On a much more positive note the City of Charles Sturt council recently invited our president and vice president to discuss sedimentation issues with elected members and to advocate for council to identify space suitable for wetlands that will, in a sense, act like the Reedbeds once did and therefore reduce silt loads entering the Gulf.

Subsequently one of the councillors, Cr Howland, put forth a motion to council to this effect and this was discussed and passed at a council meeting in late February.

The unconfirmed minutes of that council meeting can be viewed at their website <http://www.charlessturt.sa.gov.au> .

We look forward to seeing what arises from this action and if a number of wetlands or stormwater detention basins are constructed it would be a huge step towards a cleaner Gulf.

Aldinga Reef Monitoring by SCUBA Divers in the 1980s

Steve Reynolds of the Scuba Divers Federation SA (SDFSA) recently provided me with this extract from his draft history of the SDF:

The deterioration of the Aldinga Reef ‘drop-off’ was discussed at many SDFSA meetings, particularly in February 1986 when the Federation decided that it would monitor conditions around the reef over the next few years to determine the effects of the drains in the area.

The (then) Willunga Council installed a drainage system which led to a sand dune before the beach close to the centre of the intertidal platform in the Aldinga Reef Aquatic Reserve in 1975. The sand dune was used to filter out any foreign substance from the stormwater before it entered the sea. This drain caused a large messy lake to form behind the sand dunes. In 1978-9 two further drains were installed at the boundaries of the Aquatic Reserve. The water from these two drains flowed directly across the beach into the sea, taking some sand with it. Many people in the Aldinga area were pumping effluent from their septic tanks into the drains regularly, even daily.

The Willunga Council did not believe that the drains were responsible for silting up the reef but it did agree that effluent may have been causing some problems.

The SDFSA announced the launch of its Aldinga Reef Reserve Monitoring Project at its meeting on 12th August 1986. The project was assisted by the Conservation Council of SA which provided the Federation with a grant for \$1,000 to enable us to purchase an underwater camera and flash.

The initial findings of a study into stormwater at Aldinga Beach were that both Port Willunga Creek & Cactus Canyon were responsible for siltation problems on the Aldinga reef, along with silt coming from cultivation of fields in rural catchment areas.

Aldinga Reef Monitoring Groups being formed

Community members from Aldinga are again showing a strong interest in monitoring Aldinga Reef, following a recent meeting on 2nd April to find out about the intertidal monitoring program. If you are also interested in that particular reef and are keen to join them, there will be an informal session on Sunday May 13th commencing at 9:30am. The session will consist of a brief overview of the methods. If you are interested in coming along please get in touch with Agnès Cantin (see section on Intertidal monitoring in this edition), and she will provide you with more detail.

Greater Aldinga Conservation Zone network is planning a half-day seminar for around the beginning of July on Aldinga Bay coast and marine issues, to foster interest in intertidal monitoring and give people a sense of the wider context the monitoring is serving.

The network is very concerned about ongoing damage to seagrasses and possibly reefs resulting from run-off from Maslin Beach quarry, and are wondering if there is any impact to the Aldinga region. Local Aldinga people are reporting unusual levels of sediment on Aldinga Reef. The group is interested in forming a group to monitor the subtidal reef.



Want to get involved in Reef Watch?

For diving or snorkeling activities, visit our website and follow the quick link to “Next dive”. For photos and stories, see “Recent dives”.

If you want to get involved as a volunteer in our committee, administration or development work, contact Reef Watch at the Conservation Council, 8223 5155, info@reefwatch.asn.au.

Particular thanks this month to all contributors to this newsletter. We have only just coped without Pamela, who is overseas for a month. Thank you also to Jessica Kraviec who did a fantastic job on laying out the Feral or In Peril slates and brochures, to Julia Murrie who did much of the initial work in this area and to Janet Scott for updating the links on the Reef Watch web site.

Native fan worms sought

You would all be familiar with the European Fan Worm, pictured on your Feral or in Peril slates (if you don't have a set of these slates, then contact Reef Watch or pick them up from your club or shop).

SARDI Aquatic Sciences are looking for native fan worms to use for designing tests based on DNA that will enable the European Fan Worm to be detected within ship ballast water.

They have enough European Fan Worms, but need locations for **native** fan worms. If you have any information about the location of native worms, please contact

Keith Rowling,
rowling.keith@saugov.sa.gov.au,

8207 5494, or

Sharon Drabsch,
drabsch.sharon@saugov.gov.au,

8207 5456



Harlequin Fish Records Sought

In recent editions we have asked members to provide historical sighting records (i.e. log book entries) of a number of species of conservation concern. This time we are seeking records for only one species, the Harlequin Fish.



Photo Chris Hall, MLSSA

This information will be used by the Reef Watch program, along with the survey data collected over the past eight years, to make an assessment of our reefs based on the same criteria being developed by Government and being used with their own data to report to the public on the “health” of the reefs.

The concept of Reef “health” is problematic, since changes to a reef that might be considered detrimental can occur through natural processes as well as human impact. Furthermore, a “healthy” reef is often interpreted as one that is in a desirable state, from a human point of view. To date, there has been no formal attempt to capture public views on what this desirable state may be, but that is another story. Notwithstanding, an undesirable reef, for example one lacking an abundance of suitable organisms for harvest or observation, may nevertheless provide important ecosystem services. Unfortunately, our understanding of this aspect of reef “health” is also quite poor.

Thus the development of indicators of reef “health” is an evolving process. This is both frustrating and exciting for a program such as Reef Watch. Frustrating because it makes it hard for us to focus on collecting exactly the right data and report on it in a meaningful way; but exciting because we can play a pioneer role in the development and verification of such indicators.

Over the past decade, the percentage cover of brown algae has been the main indicator used to report on the health of our reefs. This is reported as a “traffic light” system, with a cover greater than 50% being deemed “good” (green), a cover of 25% or more being “moderate” (yellow), and cover of less than 25% being “poor” (red). The traffic light system of classification is being expanded by scientists to incorporate a number of different facets of the ecosystem including habitat, food chains, biodiversity, and specific problems (such as introduced marine pests).

For many new indicators being proposed, such as the cover of mussels or turfing algae, quantitative information is available for, at best, the last decade; for many others, such as the mean size of adult wrasse, there is no historical quantitative information at all. The advantage of using only the presence of a species as an indicator, particularly one with a distinctive appearance such as Harlequin Fish, is that reliable qualitative records, such as dive log books, have validity. These records can be used to help assess reefs against their former state, going back a few decades when the reefs were subject to less impact from human activity.

The Harlequin fish (*Othos dentex*) is a large, slow growing, slow moving solitary fish that changes sex from female to male in order to maintain a specific ratio of males to females. It prefers clean, clear water. It is an inquisitive species that will follow divers (at a distance). These characteristics make it vulnerable to direct human exploitation or indirect impact arising from reduced water quality.

The scientists will rightly tell us that for some indicator species, including Harlequin Fish, we can only use their presence as an indicator of a healthy reef, but we can't necessarily say that their absence indicates an unhealthy reef. But what we may be able to say is that the reefs of Gulf St Vincent used to be, in this respect, more healthy than they are today.



Illustration: Paul Jennings

There have been a large number of formal fish survey programs performed on SA reefs over the past decade, all using slightly different methods (another story for another time). The table below shows the number of sightings of Harlequin Fish and approximate survey effort for each of these programs. The number of surveys for each method has been adjusted to the equivalent number of 50m surveys. The number of surveys is specified for several fairly large regions, with little information presented on the distribution of the surveys within those regions, nor on the depths at which the surveys took place (many were in shallower water than may be preferred by Harlequin Fish. The table also shows incidental sightings, such as from the Feral or In Peril program or from diver logbook records. Some observations from the table include:

- the north-east coast of Kangaroo Island appears to be a hot spot for Harlequin Fish
- a number of the sightings are from three areas that have protection from spearfishing – namely Noarlunga Reef, West Island, and Second Valley.

To help improve our understanding of the past and current distribution of Harlequin Fish, we are asking for divers to provide us with any historical or current sightings (location, depth and any habitat/behaviour notes), as well as the approximate number of dives that they have done in each location where they made a sighting. This will help to evaluate the potential of the Harlequin Fish as an indicator species for the “health” of our reefs.

Sources:

Baker, J. (2006 in prep.) *Status of Marine Species at Risk in South Australia: Technical Report – Bony and Cartilaginous Fish*. Report and CD prepared for the South Australian Working Group for Marine Species of Conservation Concern. Coast and Marine Branch, S.A. Department for Environment and Heritage (DEH), Marine and Coastal Community Network of S.A. (MCCN), and Threatened Species Network (TSN). To be published by Reef Watch, Conservation Council of South Australia. 870p.

Cheshire, A.C., Hall, S., Havenhand, J. and Miller, D.J. (1998). *Assessing the status of temperate reefs in Gulf St Vincent II: survey results*. A report to the Environment Protection Agency of SA.

Personal communications: Dr. David Turner, Dr. Scoresby Shepherd (SARDI Aquatic Sciences), Dr. Graham Edgar (University of Tasmania), Dr. Bronwyn Gillanders (Southern Seas Laboratory, University of Adelaide), Dr. Sue Murray-Jones, (Department for Environment & Heritage).

Surveys	Transect type	Number of sightings per 50m surveys (or equivalent)				
		Gulf St Vincent	Encounter Bay	Kangaroo Island	Yorke Peninsula	Western SA
Reef Watch fish surveys 1998-2006.	Initially 50m by 3m wide, now 50m by 5m wide. By snorkel or scuba, in the latter case also now with a return pass to check for cryptic fish.	6 un-confirmed from Noarlunga (from 350 surveys, 80% of them at Noarlunga).	0 (from 5 surveys)	0 (from 3 surveys)	0 (from 66 surveys mostly at Port Vincent)	0 (from 8 surveys mostly at Whyalla)
Surveys by Adelaide and Flinders Universities for the Environment Protection Authority in 1996.	50m by 3m wide. Four to six transects per site.	0 (from 46 surveys)				
SARDI Reef Health Program 2005	50m x 5m with a second pass for cryptic fish within 1m. Two to four such transects at a site.	0 (from 80 surveys)	1 at West Island (from 16 surveys)		0 (from 48 surveys)	
University of Tasmania/Department for Environment & Heritage in 2002 (Yorke Peninsula) and 2005-6 (Fleurieu Peninsula/Kangaroo Island)	50m by 10m wide plus a 1m wide cryptic fish search. Four such transects per site.	1 at Second Valley (from 120 surveys)	0 (from 50 surveys)	26 (from 68 surveys)	0 (from 64 surveys)	
Department for Environment & Heritage 2004 study near Port Elliot for Murray-Darling Basin NRM Board	25m by 5m wide plus a 1m wide cryptic fish search. Generally two such transects per site.		0 (from 14 surveys)			

Surveys	Transect type	Number of sightings per 50m surveys (or equivalent)				
		Gulf St Vincent	Encounter Bay	Kangaroo Island	Yorke Peninsula	Western SA
Dr Scoresby Shepherd, Blue Groper and other scientific expeditions 2002 to 2006, assisted by volunteer divers/snorkellers, plus some earlier surveys.	100m by 5m wide by both scuba and snorkel. Up to a dozen transects per site.	0 (from 300 surveys)	0 (from 50 surveys)	2 (from 400 surveys)	0 (from 600 surveys)	3 (from 850 surveys)
Southern Seas Laboratory, University of Adelaide	25m by 5m wide. Six transects per site.	2 at Cape Jervis (from 24 surveys)			0 (from 24 surveys)	
Other (incidental) sightings						
Reef Watch Feral or In Peril program 2004-2006. No estimation of total dive effort can be realistically made.	n/a	1 Rapid Head, by Kevin Smith	1 Black's Reef, near Wright Island, by Ron Charles		1 Royston Head, Innes National Park, by Andrea Gordon	
Sightings by Dr. Scoresby Shepherd, 1961-1969. 150 dives on relevant reef habitat.	n/a	2 (Aldinga drop-off and Port Noarlunga gap)			3 (Clan Ranald, Port Vincent, Pt Giles jetty)	2 (Wedge Island, Thistle Island)

Reef Watch currently receives most of its funding from the Adelaide and Mt Lofty Ranges Natural Resources Management Board through the Natural Heritage Trust, with support also coming from the KI and Northern and Yorke NRM Boards.



A number of other organisations or agencies have provided some funding or in-kind support, including:

Primary Industries and Resources SA



SA Research and Development Institute

Department for Environment & Heritage

PADI Project Aware



City of Onkaparinga



The diving industry has also given considerable support to Reef Watchers for the annual Marathon Dive, Quiz Night and in some cases for dives throughout the year. Details are listed on the website.

The Reef Watch website is www.reefwatch.asn.au

If undeliverable return to:

Reef Watch

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120 Wakefield St

Adelaide 5000

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