

JULY / AUGUST 2015

OZ DIVER

AUSTRALIA'S PREMIER DIVE MAGAZINE

SEAFOOD GUIDE

CAVE
DIVINGLUST
FOR
RUST
PART II

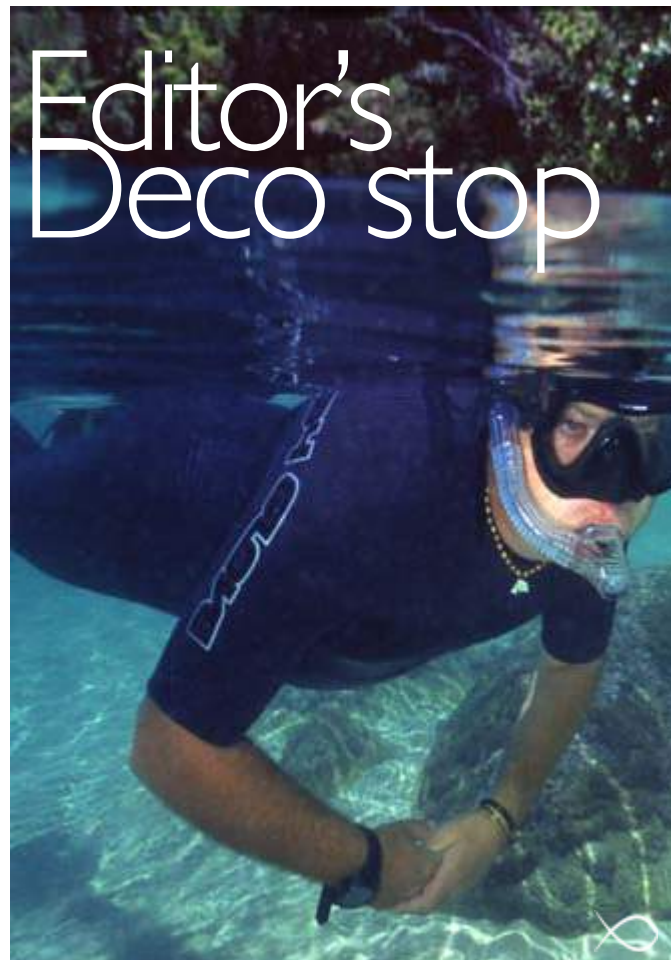
AQUAFRESH

OCEAN
VISIBILITY

PAPUA NEW GUINEA

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I have to say that my Book "The Dive Spots of Western Australia" is out and it is really doing very well. Much better than I ever expected. When I printed my new book I also decided to print a second edition of my two other books, "Marine Life Species Guide" and "The Diving Photographer", they are also doing very well.

On a better note. I have started to do talks again and have now done a couple in Western Australia. I am very excited to be giving one at AIDE 2015 the Dive Expo, which is happening in Sydney 12 – 13 September. Here I will talk about finding a living Dinosaur: the Coelacanth. For many years the Coelacanth was thought to be extinct until a few divers started looking

for them and found them in waters exceeding depths of 100m. This changed the history books. I was part of many Coelacanth expeditions and swam with this living Dinosaur in its natural habitat. We will also have a stand at the dive show so please come and say hi to us when you are there.

The OZDiver magazine website and the Apple App is running very well (www.ozdiver.com.au) I am also very pleased to announce the availability of the Android OZDiver App which means the magazine can now be found everywhere, read anywhere on any device. Just Search for OZDiver.

This edition is full of interesting stories and articles. It includes marine and ocean facts, and we travel from Western Australia to Papua New Guinea. We look at how to take better photos, and if you can't, we look at how to edit them so they will look better.

Like every other edition of OZDiver magazine this one is full of articles for the beginner diver as well as the more technical diver. I hope that you enjoy this edition of OZDiver.

If you want to publish your articles or photos in OZDiver magazine do not hesitate to contact me.

The Editor & Publisher

Johan Boshoff

-it is all about the journey and not the destination

Genesis 1

1 In the beginning God created the heaven and the earth. 2 And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

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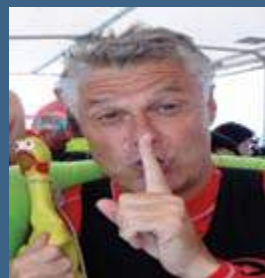
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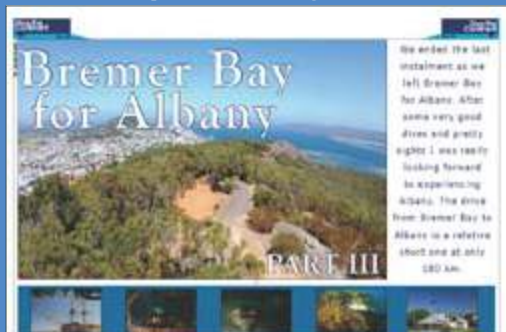
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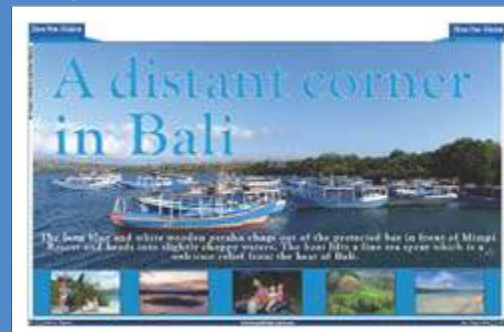
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How stupid can they be? Why everyone in the world should care about the Reef

Everybody remembers their first dive. Well, take pity on me because my first dive was in Ireland, back in the 70s. I had no idea how great the underwater world could look until I moved to Australia, where I eventually made a living diving and educating people about the Great Barrier Reef. I've seen a lot in my time, and the Reef itself has changed me in some big ways. Back in 1998, I thought climate change was some far-off thing happening in the future. But when I saw coral going from fantastic pink and orange colours to dead, bleached white – well let's just say I understood: this is real and it's happening now. Nothing could strike me as more stupid than building a new mine for the dirtiest fuel we have, and putting it next to the Great Barrier Reef. You too? Great, let's stop it.

I'm not the only lad irked by all this. I've got mates who work the coal boats down at Gladstone and they tell me about the dust coming off, coating the surface of the water on a windy day. It's obvious that this stuff is bad for the sea and marine life. The guys feel it should be managed better – but when transporting stuff like coal, the companies do it the cheapest way possible. That's what companies do because they put profit first. It all gets you thinking, what the hell are we doing? I may not be the biggest greenie, but I've been a Greenpeace supporter for a while now and I think it's going to take all of us to stop this new coal mine and educate people about what's really going on. Greenpeace have a cracking campaign ready to put the eyes of the world firmly on what's happening up here, and if we all get behind it, all the dirty money and political tricks in the world won't be able to stop us.

<http://www.greenpeace.org.au>



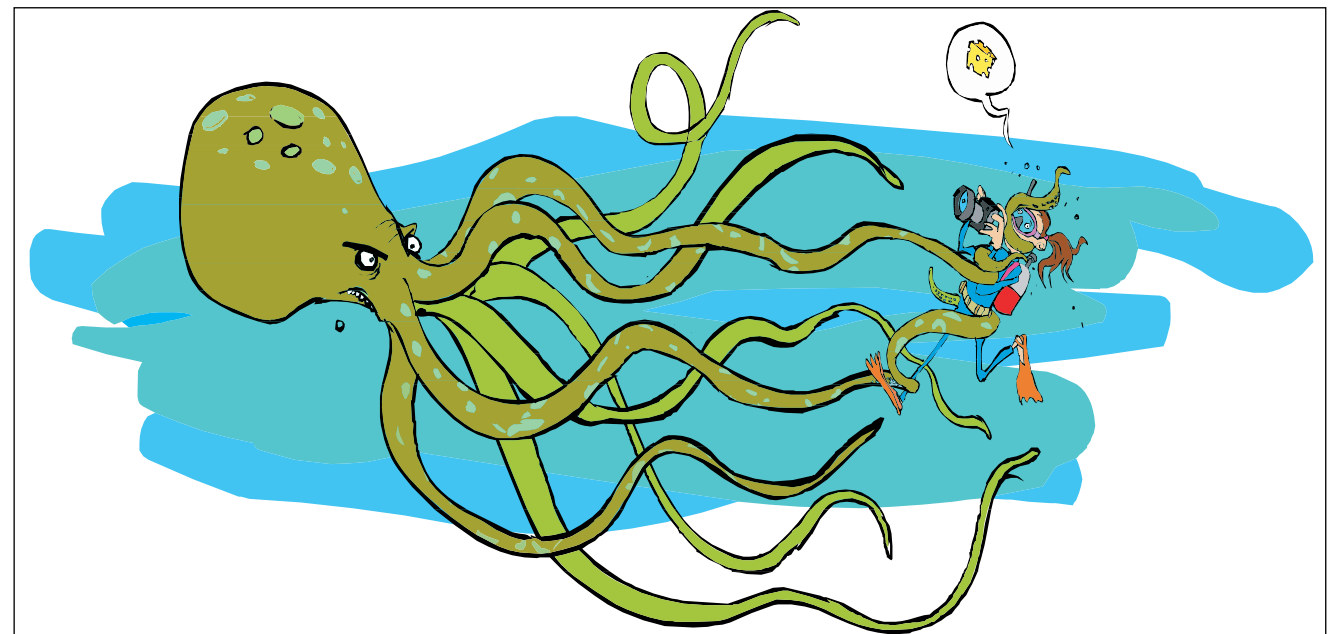
My Close Call

It was like a scene from a James Bond novel - a giant squid had risen from the inky depths and was about to drag me down to its lair...

It was a typical temperate diving scene, green water, lots of kelp, some interesting boulders with the odd splash of colour and the occasional darting fish. Massive lobsters lurked under the crevices but retreated when I tried to get close enough to photograph them. I wasn't going to be bringing home any great pics from this dive adventure in the marine park off Bicheno, Tasmania. Then my chance came. A big occy sat out in the open, posing perfectly and putting on an incredible display of changing hues as I set up my camera a foot away. I pressed the shutter button; suddenly huge tentacles clutched my arm as the octopus sprung, enveloping my strobe. My attempts at pulling away came to no avail; the more I tried to flick its arms off, the more of the strobe arm and camera it swallowed. I could hear my buddy chuckling, before coming to my aid but despite their pulling and flicking, neither he nor the DM could persuade the beast to release its grip.

More tentacles reached out, now it was pulling at my gauges and octo. My buddy tried scaring the beast off by purging his octo at it, but it simply tightened its grip. I was beginning to get scared. It was like a scene from a James Bond novel - a giant squid had risen from the inky depths and was about to drag me down to its lair. Now I understood Bond's obsessive fear of the deep. Startled by the flash as I tried to photograph it, the vast octopus had sprung at the source of the intrusion. My strobe. Me. It's strong arms were creeping up, already they were wrapped around my own. One tentacle was tugging at my reg. The raw power of the creature was incredible, I was not going to release its grip; it was time for more drastic action. With one hand holding my reg in place I headed for the surface to seek the skipper's help. As he attempted to pull the camera out of the water the cephalopod finally relinquished control and headed back to the seabed. My first dive in Tasmania was a dive to remember.

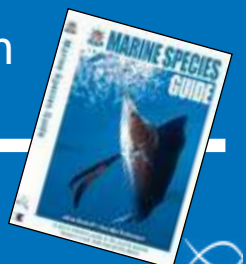
But don't let this put you off. Tassie offers great cold water diving with all sorts of exotic creatures such as leafy sea dragons to enjoy.
By Fiona McIntosh



WIN

Send your letter to us and win
a Marine Life Species Guide

Here is a chance to be heard! If you have anything that you would like to share with OZDiver Magazine and other divers, send an email to Log Book at johan@ozdiver.com.au. Remember that letters have more impact when they are short and sweet. We have the right to edit and shorten letters. In every issue, the winning letter will receive a Marine Life Species Guide. ■



OZ News



AIDE RETURNS TO SYDNEY IN SEPTEMBER 2015

Following the inaugural debut at Sydney's Royal Hall of Industries in Feb 2014, the Australia International Dive Expo will return even bigger and better in 2015 from 12-13 September. This second installment will feature pool dive try-outs, a stunning photographic and film presentation of the marine world, a line up of speakers and even bigger children's corner, a series of prizes to be won over the weekend event.

This year, AIDE welcomes more than 50 exhibitors to share their passion for the sport including knowledge of new and existing dive destinations, trends and gear with the growing Australian dive community. Exhibitors include dive certifiers, tourism boards, dive resorts, operators, equipment providers, marine conversationalists, photographers and many more.

Pavilion for photography, conservation and free diving will be set up to welcome diving enthusiasts to share their passion, expertise and knowledge with the public through presentation.

Non-divers interested in learning more about diving can also sign-up to join other newbies for a taste of the sport at the on-site pool. For the try-outs, participants would get an introduction to scuba diving and learn about the basic dive equipment required before getting geared up to experience a shallow introductory dive themselves.

For business on diving, explore trade opportunity, networking and new market through B2B session on 11 September 2015 at the venue.

Visitors will be offered exclusive dive holiday deals, a range of dive courses to suit their requirements, special offers on the latest scuba diving and camera gear, expert tips on underwater photography, information on ongoing marine conservation practices and a host of other engaging activities. And while

**AUSTRALIA
INTERNATIONAL
DIVE EXPO**

**AIDE 2015
DIVE & DISCOVER**

the adults are kept occupied, children will be kept entertained in a large kids section where they can let their creativity run free, while learning new skills in arts and craft. Visitors will get to watch short films on documentary which will be screened for the 2 days.

Interested visitors will also be able to enter competitions to win:

- Dive gear worth \$4,000 - pool dive try for non-divers;
- Four (4) diving holiday prizes.
- Three (3) prizes for the Facebook competition.

Join us to be part of the show or meet us to SEE, FIND & HEAR everything about the world of scuba diving.

For more information, visit www.australiadiveexpo.com.

RAID RELEASES NEW BASIC WRECK COURSE

RAID International is proud to announce the release today of the first in their new series of wreck diving courses; the RAID Basic Wreck Course. On making the announcement RAID International Director Terry Cummins said: "we at RAID believe this is the most diver responsive wreck program ever released. Many divers feel wreck diving is a super advanced form of diving, when in reality it does not have to be that way. In the RAID Basic Wreck Course we acknowledge some divers just want to go down and look around the wreck site and may never want to penetrate the inside, or in other cases the wreck is just not suitable for penetration with artefacts spread across the bottom. Unfortunately, this means that many other courses do not deliver the sort of relevant information these divers need to enjoy such a dive or what I call; relate to the wreck and its history. So what we have with the RAID Basic Wreck Course is a program that responds to 80 percent of wreck dives the average diver will do – all very none technical, in shallower depths, but at the same time extremely informative and enjoyable. And of course, like all RAID Courses, all the academic section of the course is online".



The RAID Basic Wreck Course brought together keen and experienced wreck diving enthusiasts like Paul Toomer, Mark McCrum and Karl Grady. Well known wreck researcher: Joane Edney assisted with ground breaking sections on wreck conservation and preservation. Cummins himself has a long history in wreck diving, is a OZTeK and other award recipient and has personally developed the RAID 10 Point Guide to Wreck Diving which is a great guide to how all divers should approach wreck sites. Cummins added: "as the primary author, I was lucky enough and honoured to have a tremendous team working with me to cover not only the practical side of basic wreck diving, but also experts like



Joane Edney to cover important issues like wreck conservation and preservation that just don't appear in other wreck courses. The result is a program with information found no other place".

RAID International Training Director, Paul Toomer said: "we conducted a Beta Test on the new RAID Wreck Diver programs and Deep 40 Course in the UK and were super impressed with the input we received. The RAID wreck diver programs are unique in the diving industry. For the first time there are state of the art programs enabling divers to engage in wreck diving in a manner that suits their own desires. These programs have been designed, written and reviewed by some of the world's leading wreck explorers. They are highly informative and go way beyond the scope of any other recreational wreck programs available on the market today".

When asked why he thought the new breed of RAID wreck diver courses were so special. Toomer replied: "Divers can choose to swim safely, photograph and map wrecks from the outside on our RAID Basic Wreck Diver Program or take things to a whole new level with the soon to be released RAID Advanced Wreck Diver Program".

RAID International Recreational Training Director Mark Mc Crum said: "the Basic Wreck Course covers general information about wreck diving, but also goes into specific detail on equipment required and various gear configurations, dive management and open water considerations". Mc Crum concluded: "at RAID we are proud to have created a wreck diver program that has cutting edge ideas, sensible practical training and seamless integration to our other RAID programs. It is a great addition to the RAID extensive list of courses".

While RAID International CEO Jim Holliday said; "what the RAID Team has produced with this course is ground breaking. For a long time I have been hearing that many divers just want to go down and look at a wreck, tick the box as it were and do not want to do a whole lot of extra training to make their way inside when that may never be their intention".

One of the key features is the program allows Open Water 20 divers to take the course. Knowledge and dive credits dovetail into the new RAID Advanced Wreck Course, also due for release this month. Cummins stated: "you will have to wait for what we have in store for you with the Advanced Wreck Course, but I must say that one is awesome and again brought together some of the most experienced wreck and overhead environment diving educators available".

To learn more contact your local RAID Regional Office or find all the information you need on all RAID programs on www.diveraid.com and www.freedivingraid.com



85% of Australians say Reef not Coal

The overwhelming majority of Australians would choose to protect the Great Barrier Reef over expanding the coal industry, according to an opinion poll commissioned by Greenpeace Australia Pacific. Polling company ReachTEL contacted more than 2,500 people across Australia asking them to agree or disagree with the statement:

'If I had to choose between protecting the Great Barrier Reef and expanding the coal industry I would choose protecting the Reef'.

An enormous 85% agreed. (1)

"The Australian public has made it clear that they want the Great Barrier Reef – and all the good that it brings for our economy and environment – not a dying coal industry that is in global decline," said Reef campaigner Shani Tager. "The public reaction mirrors recent scientific analysis which has also made it clear that Australia can have a healthy Reef or coal, but it can't have both," Tager added.

The opinion poll and scientific opinion (2) comes as yet another blow to the company attempting to force through the Carmichael mega-mine and Abbot Point port expansion. Adani Mining's financial controller Rajesh Gupta last week admitted in the Queensland Land Court that the company would not be bringing the promised 10,000 jobs if the mine opened, but only 1,464. (3)

Mr. Gupta's testimony also raised further doubt about the financing of the project. Eleven international banks, many of which already invest in Australian mines, have said they won't invest in the Carmichael mine.

In the coming weeks UNESCO will also

publish its draft conclusions about the Australian Government's commitment to protecting the Great Barrier Reef, after raising serious concerns about the poor health of the World Heritage Area in recent years.

Greenpeace is urging UNESCO to place the Great Barrier Reef on its "in danger" list until the Australian government presents a credible plan for its protection – one that does not include the expansion of coal mines and ports. www.greenpeace.org



Dive Schools / Operators / Organisers / Instructors

Do you have any interesting, newsworthy info to share with the industry? If so, we would like to invite you to send us your OZ News section for possible inclusion in the magazine (please note that inclusion is FREE of charge).

Here's what we need:

- Newsworthy stories (promotional material will not be accepted)
- Word limit: 100 words
- Text prepared in a Word document
- Accompanying high-resolution image(s) are welcome (please supply caption and image credit)

Please send to info@ozdiver.com.au

AUSTRALIA INTERNATIONAL DIVE EXPO

AIDE 2015 DIVE & DISCOVER

12-13 September 2015
Royal Hall Of Industries
Moore Park, Sydney

Join Us & Explore "Business for Diving" at AIDE 2015

Event Highlights

- Agency Seminars
- Product Knowledge Workshops
- Main Stage Presentations
- Pool Try-Dive For Non-Divers
- Photography & Conservation pavilions
- Photo Comp-Underwater Project
- B2B Meeting for Trade
- Exciting Holiday Prizes to be Won
- Facebook Contest for Visitors
- Fun Kid's Activities

Free Entrance for under 17 years old,
Disable Divers & Senior Divers over
60 Years old



Albert Li



Chris Wachholz



Johan Boshoff



Linda Cash



Lucas Handley



Dr Michael Bennett



Phil Enright



Zainal Ben Rahman

Invited Speakers...
and many more

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Bremer Bay for Albany

PART III

We ended the last instalment as we left Bremer Bay for Albany. After some very good dives and pretty sights I was really looking forward to experiencing Albany. The drive from Bremer Bay to Albany is a relative short one at only 180 km.





After having visited mostly small towns I was excited to visit the largest town on our journey. Albany is a port city in the Great Southern region of Western Australia, 418 km from Perth. Interestingly, Albany is the oldest permanently settled town in Western Australia. Perth and Fremantle were only settled two years later. Albany has a population of 30,656 at the last census done during 2011, making it the sixth-largest population center in Western Australia. Albany was founded on 26 December 1826 as a military outpost of New South Wales and was initially named Frederickstown in honour of Prince Frederick, Duke of York and Albany. The settlement was transferred to the control of

the Swan River Colony in 1831 and thereafter renamed Albany by Lieutenant-Governor James Stirling. The city centre is located at the northern edge of Princess Royal Harbour, which forms part of King George Sound. The central business district is situated between Mount Clarence to the east and Mount Melville to the west. The City really has a beautiful character cemented by the fact that it has managed to keep the old world charm alive by preserving the period architecture as it was when it was founded almost 190 years ago. Time has not been standing still though, the very modern Albany Entertainment Centre that was opened in 2010 stands in stark contrast to the period features in Albany. After arriving in Albany we drove through the town to get some initial impressions and we were not disappointed. Albany is like all towns and cities I have seen so far. The town has a relaxed feeling about it, one that we have got accustomed to on our travels. Although this was the biggest town we visited on our travels with much more traffic it never felt that there was a hurried rush and people were friendly every place we went. We then set about finding our accommodation for the time we were to spend in Albany. We found



a very nice and affordable Caravan Park just outside of town at Emu Point, with great facilities and camping areas. The beach was a short walk away and I could not keep away. I spent some time just sitting there in solitude watching locals and their pets pass on by. This is also the reason I like diving. Although you are diving with a buddy you are also left alone with only your thoughts and the beauty that is underneath the waters surface, which relatively few people ever get to experience. After a good nights rest we made our way to town in order to meet with Garry at Southcoast Diving Supplies. He was our contact to show us the sites and scenes of Albany. What a friendly guy he turned out to be. He received us with open arms and seemed genuinely interested in our mission and ideas in building the dive industry in WA as this area has so much to offer. We asked him where to start our diving and he immediately suggested we dive off shore, he had some great sites for us and he would take us the next day. That left us with some time to kill so we set of to the lookout point on Mount Melville, which is set within native bush and has some walking trails. The summit is easy to reach as the roads are sealed all the way to the top. The observation tower forms part of a radio tower

that is accessible on one level to the public, it offers an almost unrestricted 360 degree view of the whole area. Although It was rather windy I really enjoyed it and we could formulate our plan of action. We decided to make our way along one of the many bays in a south easterly direction towards Frenchman Bay. We made our way along the bay until we reached the Princess Royal Sailing Club in Little Grove, after whcih we made our way back to tour the town some more. The town has many interesting places to see and visit and for us it is always interesting to know more about the area and its history. There is no better place to do just that than the Western Australian Museum. The museum offers visitors the opportunity to see exhibitions, public programs, educational programs and information on the unique natural and social history of the region. It also shares stories of the indigenous Noongar people as well as stories of the early settlers and convicts. One of the more notable long term exhibitions is of The Residency Building, which was completed in 1850. The original building served as a store and office for the nearby convict-hiring depot. In 1872 when the depot closed, more rooms were added and from 1873 to 1953 it was the centre of the town's social events. After this it became home to the





OZ DIVER



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By Gerrit Maritz local government administrator. After this part of its history it was restored in 1975 and it then became known as The Albany Residency Museum and also the first branch of the WA Museum outside the metropolitan area.

The other long term exhibition is that of The Eclipse Building and is the main focus of the Western Australian Museum – Albany and this where one would find the Lighthouse Exhibition, Fishing Collection and where information the local history can be found as well as the Eclipse Island Optic. This consists of three glass lenses, each three metres high, which light up the building. The marine discovery centre is also located at the Eclipse building where hands-on learning can take place.

By far the most significant display for me was The Amity, the ship that sailed from Sydney on 9th November 1826 and brought the first settlers to Western Australia's Frederickstown on Christmas Day 1826. The members that arrived were Major Edmund Lockyer along with a captain, surgeon, storekeeper, 18 rank and file soldiers, and 23 convicts, mostly tradesmen. Also on board were the vessel's own crew and a naval party comprising Lt Colson Festing, a quartermaster, midshipman and a marine batman - and stores for six months, including sheep and pig. The

replica of the brig can be visited and guided tours are conducted regularly.

After some time roaming around the exhibits and relaxing under the lush green trees we decided to further explore the town. There is much to see and obviously time was not on our side. We decided to drive around town with no specific agenda but to see what else there was and before long we found ourselves at the Patrick Taylor Cottage

This house was constructed entirely out of wattle and daub. Unfortunately we arrived too late and we could not enter but through some of the windows we could see that it was still furnished as it would have been in the late 1800's. This cottage is also the oldest surviving dwelling in Western Australia and is the pride and joy of the Albany Historical Society and I recon its an attraction that all visitors to the area should go and visit.

After the visit to the Patrick Taylor Cottage we stopped off at the Albany Port Authority building to admire the view of the port and some of its structures. We continued our travels and I must say we took many a wrong turn but that is how you get to know a town and we took it in our stride.

Albany has by no means been left in the



1800's, for standing as a monument of modern architecture is one of the most eye catching buildings. Right next to the water in the harbour is the Albany Entertainment Centre that was opened in December 2010. The Entertainment Centre can best described as the arts and culture hub of Albany and regular concerts and shows are presented to entertain the inhabitants of the area.

After some time dwelling the back streets of Albany we made our way back to our camping spot as we had to prepare our kit and equipment because, the next day we were going to dive some of Garry's handpicked diving spots.

The next morning we woke to a less than perfect day but like we always say, a bad day diving is still better than a good day at the office. We were not perturbed and we packed our diving kit and equipment in the van and made our way to the dive shop to meet up with Garry. We arrived early but we were in no hurry. After a bit of waiting Garry arrived and we were soon on our way to the harbour to launch his dive tinny. We loaded all our gear on the boat and fortunately the weather cleared up and soon we were ready to depart. We were quite excited as this would also be our first boat dive of the trip and we would be diving the HMAS Perth (D38) and another site

that Garry chose for us.

After leaving the safety of the harbour we set off in a north easterly directing heading towards Seal Island located in the King George Sound. We made our way to the resting pace of the HMAS Perth and did a quick survey of the conditions at the wreck. We would be diving there later that day, getting an idea of the size of the wreck filled with excitement of what was to come.

Garry turned the tinny around and pointed it in the direction of Breaksea Island, 12 kilometres south-east of Albany where we going to dive a site called The Cables. The Cables is situated on the northern side of the island about 100m offshore and almost right underneath the lighthouse. The site name comes from an old mainland communication cable that is tangled around and through the site. This cable is not the only attraction as there is a maze of tall bommies scattered around and according to Garry this site provides some of Albany's best diving. We were excited to get in the water and we got dressed and kitted up in no time. Before we got wet Garry gave us a quick dive briefing and he made a point of telling us to be on the lookout for white pointers. They had been spotted there as they were using this area to hunt for seals.

The plan was to do a negative entry into the



water and get to the bottom next to the bommies as quick as possible. Garry did the countdown and we were soon headed for the bottom of the divesite. After reaching the bottom we quickly orientated ourselves and set off exploring the area surrounding the large granite bommies. We soon discovered the cable that gives this site its name. We had a great time swimming next to the granite walls and through the narrow and deep swim throughs. We really had a good time and one will find large fan and plate corals and sponges that coat the bommies.

The divesite rages in depth from around about 8 meters all the way down to 28 meters at the deepest part. You will find scorpion fish, western blue devils and nudibranchs – my favourite. Large blue groper can also be found cruising around this site. There are also hundreds of other fish that abound the area and who call these bommies home: what a lovely sight indeed. After swimming around and exploring the deeper parts of the dive it was time for us to leave the bottom and to make our way to the surface. In all the excitement I managed to build up a decompression obligation and could not surface without first completing my decompression stop, this however, meant that I would have to spend extra time in mid water hanging on the anchor line. This would normally be done without a second thought but remembering what Garry told us about the white pointers in the area made this a bit of a dangerous proposition. There was no getting around the fact that I would have to complete my decompression stop if I wanted to dive the HMAS Perth. The only thing I could do was be on the lookout for any large shadows bearing just as large teeth.

Fortunately for me I completed my decompression and safety stops without any interruptions and I was soon on the deck kitting off and recounting the dive with Johan and Garry. It was well worth the time to travel there and I would recommend the dive to experienced and novice divers alike. The visibility is good year round and the added excitement of possibly spotting white pointers adds another element to the dive.

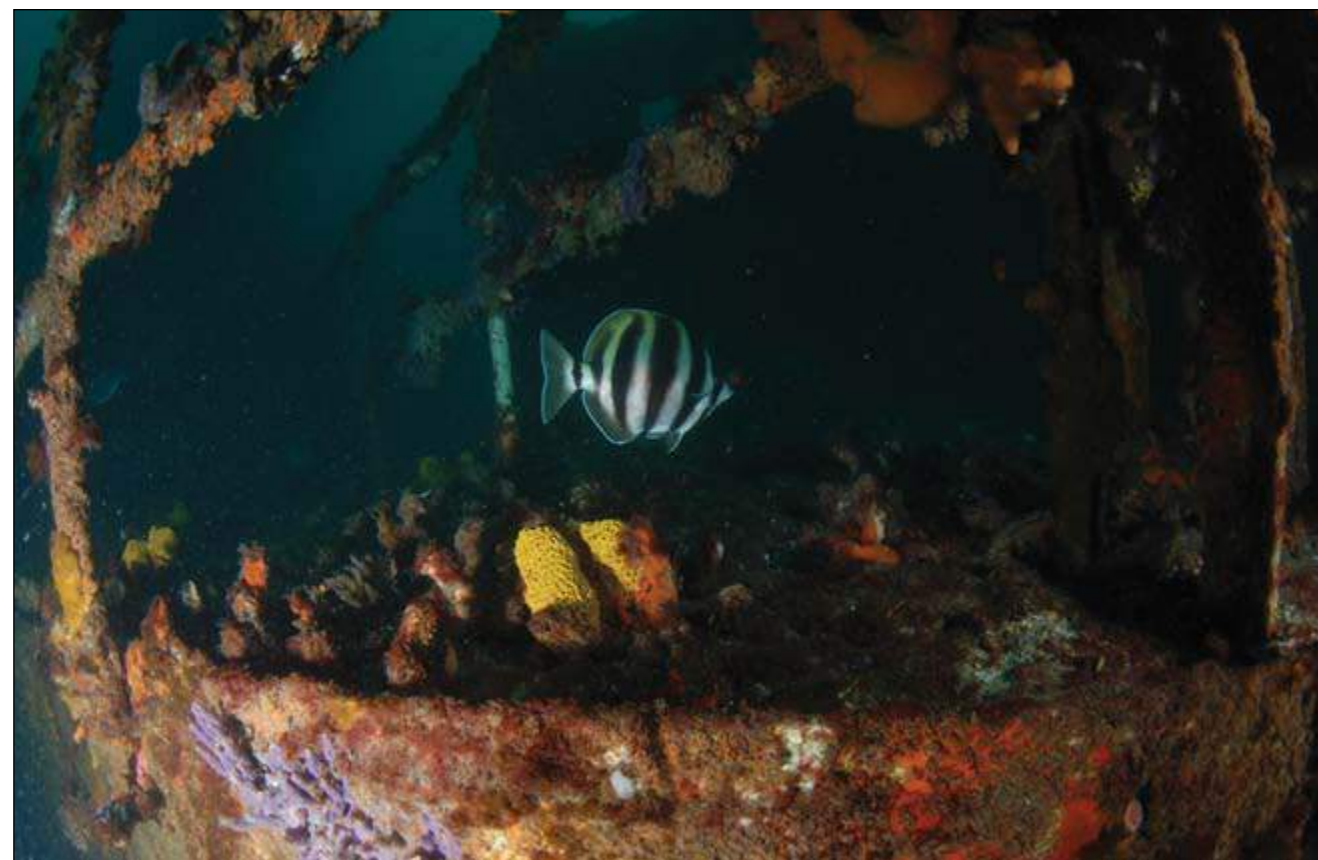
After getting warmed up we set off back on the route we came – back to SEAL Island. We had some time to waste as we could not do another dive directly after the first. Our bodies first had to be given time to rid itself of all the built up gasses in our bloodstreams so we were in no hurry to get to the wreck of the HMAS Perth. We would give ourselves two hours sit out time

before entering the water again.

After we arrived back at the wreck dive site of the Perth we once again kitted up and Garry gave another quick dive briefing as to the layout of the wreck and what to look out for. What makes this wreck really easy to dive is the fact that a piece of the mast is sticking out above the water, which can easily be followed down to the main body of the ship. This also makes for easy decompression as you are close to the wreck at all times. The visibility seemed to be acceptable although I'm sure it usually is much better. As it was later in the day we had our torches at the ready along with the lights on our camera equipment, this would give enough light should we need it. Not perturbed we entered the water right away, we could see the mast and we followed this down to the wreck. It was an amazing sight. I love diving on wrecks for this very reason: the unexpected. From the boat you get an idea of size of the wreck but once in the water everything just seems much much larger.

The HMAS Perth was scuttled on November 24th 2001. It was destined to be a wreck to be dived by many divers and with this in mind it was prepared to easily allow properly trained wreck divers to enter the wreck to explore the interior. Other levels of diver can easily navigate outside of the wreck without fear of getting entangled or lost. After many years submerged the wreck has extensive coral and sponge growth and is rapidly maturing as an artificial reef and habitat for many types of fish such as large schools of yellow tails that seeks shelter around the wreck, along with scaly fin, leather jackets and humpback boxfish. There are also carpet sharks that have taken up residence inside and large samson fish often circle the perimeter. Western blue devils, harlequin fish, nudibranchs and false tasmanian blennies can also be found and seasonally schools of large kingfish also have been found to visit the wreck. Sponges, mussels, oysters, scallops, cuttlefish and a plethora of local fish also surrounds this wreck.

Like I said the wreck is large and at 133m long it was no light weight. The visual impact of wreck is awe-inspiring and much of the ship's equipment and machinery has been left in place. The wreck lies at a depth of 36 metres with an average depth of 28 meters. This makes it an explorers delight. At the aft a large gun was left place and on the bridge we found the captain's chair in its place. Johan pretended to be the ship's captain for minute and it looked quite strange seeing a diver commanding a ship of this size. We made



By Gerrit Maritz



our way to the stern and due to the fading light and visibility I got an eerie feeling. This just added to the suspense of being unsure what to expect. We found the area where missiles were kept and we found some impressive winches and other pieces of equipment not removed before it was scuttled. You can dive into these big open areas and have a look around.

My keen eyes also found one of the heads (toilets) on the ship and after some subtle sign language and gestures we had a good chuckle at making this discovery. We were nearing the end of our dive and we had to make our way to the centre of the wreck and up the mast. We took our time ascending to the surface as there was no rush, we had done two great dives and we really enjoyed it. We used this time to take some more pictures of the abundant life around the mast. On all our stops we were greeted by fish and sponges that now call this wreck home.


This is surely one of the "must dive" dive spots when visiting Albany. The wreck is suitable for all divers and is still in a very good condition. I'm sure that when the visibility is at its best this dive will not be easily beaten in terms of views and sights.

After kitting off and getting dressed in warm dry clothes we were on our way back to the harbour and after helping Garry to get the tinny back

onto the trailer we thanked him for all his effort and drove back to the dive shop to wash our kit and to let it dry because tomorrow we would be bidding Albany a farewell.

At the campsite that evening we enjoyed our last BBQ and had a couple of drinks. We called it an early night in order to rest up for the drive back to Perth the next day. Waking up the next morning we were greeted with a slight drizzle. This made breaking up camp a damp affair. We made short work of it and soon we were on our way for a final visit to the dive shop to pick up our equipment and to properly thank Garry for all his help and hospitality.

All that was left was to point our vehicle in the direction of Perth and to complete the last 480km of our journey and this unfortunately concluded our visit to the south coast of Western Australia. This has to be one of my all time favourite and epic road trips. One that showed me the beauty of the country and especially the untamed beauty of the coast with its beautiful beaches, turquoise waters and mild temperatures. This surely is a journey I will never forget.

I am however, sure that I will be back in the near future to visit this vast and great country as there many sights still to be seen and places to visit. Two weeks of travels only scratched the surface of Western Australia. 



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Sea Anemones



Sea anemones are animals that resemble beautiful underwater flowers. Their petal-like tentacles range in colour from white, yellow and orange to red and deep purple.

The slow, graceful movements of their tentacles are deceptive and anemones are in fact voracious carnivores that feed on marine creatures. Some species are cannibals and will even devour smaller anemones. They do not suddenly lash out and seize their prey - their action is far subtler. The tentacles are equipped with cells that sting and paralyse the prey, be it a fish, shrimp, crab or any other creature wandering past. When a tentacle brushes against the prey, the cells release the sting and adjacent tentacles fold over to hold the creature as well as sting it further. The victim is then moved around and pushed towards the mouth, which lies at the centre of the tentacles.

The sting of anemones found along the coast is not harmful to humans. If you place your finger in the centre of an open anemone, the tentacles react as if they have a large meal in their grasp and close inwards, attempting to push your finger into the mouth. This pulling sensation can be a little unnerving and as you extract your finger, the friction of the tentacles feels much like the rough lick of a cat's tongue.

Most anemones have a slit-shaped mouth rather than a round one and are capable of swallowing fairly large creatures. Their throats secrete a slime that allows the food to slide down into the hollow interior, which is the stomach. Down each side of the throat is a hairy groove. These hairs pump water into the anemone's interior, where it breathes by extracting oxygen from the water. The oxygen requirement is relatively small as the anemone is almost motionless and does not use much energy.


When exposed to bright light or when left high and dry after the tide has gone out, the anemone will fold its tentacles inwards into its mouth and form a tight ball. Since they are not plants, the anemones don't have roots and cling to rocks with the aid of muscles and sticky mucus. They stand on a fleshy foot and are capable of moving around, almost like a snail. Some anemones have been spotted "walking" with the assistance of their tentacles.

Marine aquarists often obtain anemones and position them in aesthetically pleasing positions in their tanks, only to find that the animals have walked up the glass and positioned themselves in the stream of air bubbles coming from the filter. Clown fish are often kept in the same tank as anemones as the two live together in nature and these tropical fish are not harmed by the stinging tentacles. Anemones have many enemies, such



as sea-slugs (nudibranchs) and certain fish and crab species which ignore the stinging tentacles and find that anemone flesh makes for a tasty meal.

These creatures reproduce in a variety of ways. They can slowly split from top to bottom, or split in half at the waist. Before this splitting motion takes place, a new set of tentacles grows around the bottom half just below the breaking point. Some species produce little buds at their base and these baby anemones break off from the adult and live on their own.

Sea anemones can live for many years, and in some aquariums they have been recorded to live for almost a hundred years. Many species live alone, while others grow in colonies. These anemone colonies are called zoanthids and are commonly found. 



Ocean Visibility

Why is it that on some dives the vis is great, while on others it is so bad that it's hard to keep track of your buddy, never mind the scenery?

Underwater visibility varies not only with location along the coast, but also on a day-to-day basis at any one location, particularly on the west coast. Understanding this sometimes dramatic variability requires some basic knowledge of the underwater light field, which is not only central to determining the visibility, but also to explaining the colour of seawater and the strange and wonderful adaptations of certain marine organisms.

The principal source of light in the ocean is the sun (there is also bioluminescence and reflection from the moon), and this varies not only between day and night, but also with latitude, season and cloud cover. These factors determine the amount of light reaching the sea's surface, at which point some light is reflected and the rest enters the ocean. The light that enters the ocean is refracted

(bent), which is why if you look towards the surface during a dive the whole sky appears in a compressed circle above your head (known as Snell's window). Once in the ocean, some of the light is transmitted, some is absorbed and the rest is scattered. Light as we see it, termed 'visible light', can be divided into different components or colours – as happens in a rainbow. These colours are not absorbed equally by the ocean, but red (long-wavelength) light is absorbed preferentially, while blue (short-wavelength) light is absorbed the least. This means that blue light penetrates the deepest into the ocean, and since it is also scattered preferentially it results in the ocean appearing blue. This 'differential' absorption and scattering of light is also responsible for red and orange colours 'disappearing' on a dive and in underwater photos taken without using artificial



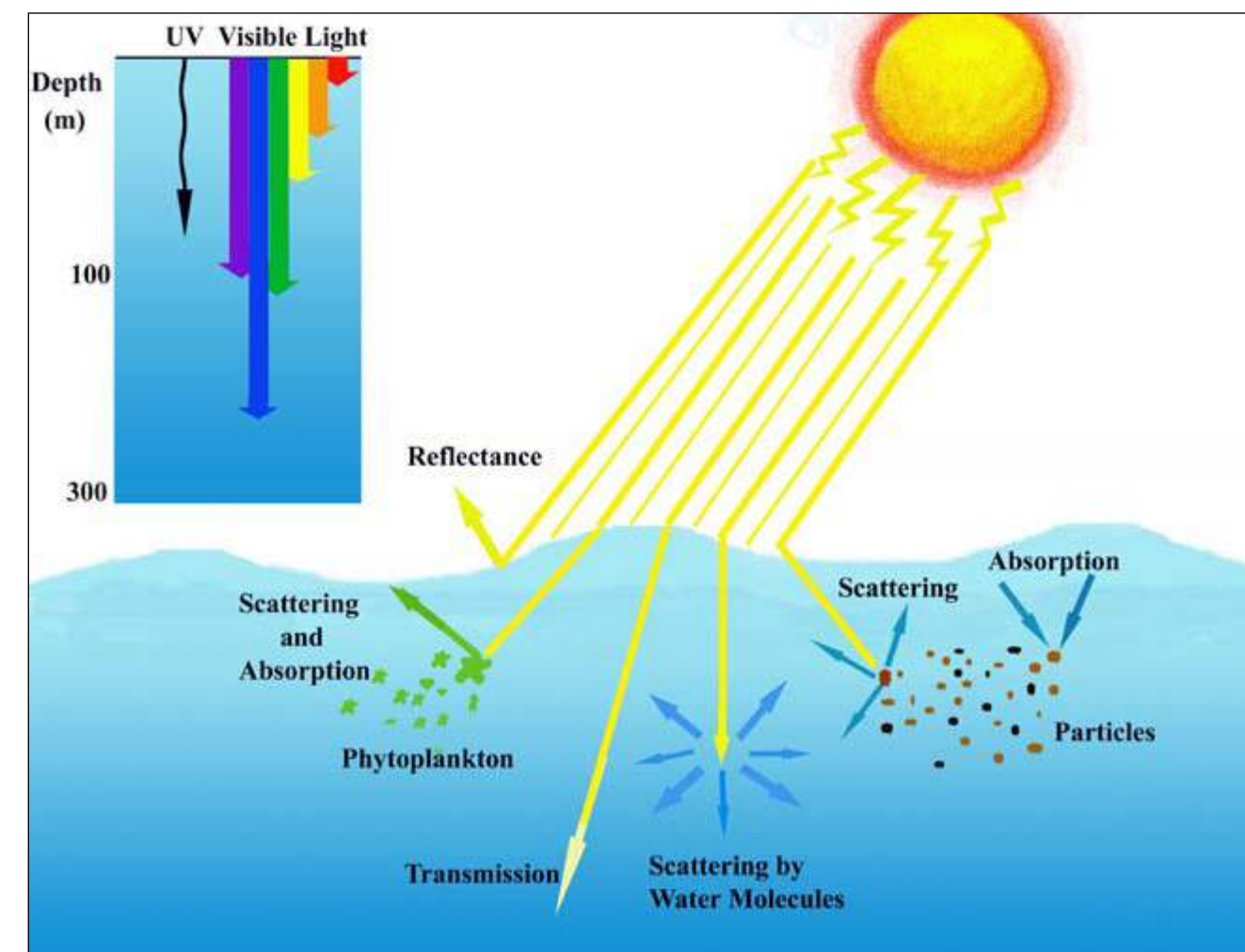
lighting.

Absorption and scattering are caused not only by the water molecules themselves, but by differing amounts of both living and non-living particulate matter. It is these differing amounts of matter and the consequent different amounts of absorption and scattering that cause differences in visibility and colour in the ocean. Microscopic algae, called phytoplankton, form a significant part of this particulate matter. Phytoplankton, known as the 'grass of the ocean', are particularly good absorbers of red and blue light, and reflect green light, just like plants on land. Therefore, in regions of high phytoplankton concentrations, the ocean appears greenish and underwater visibility is restricted because much of the available light is being absorbed by the phytoplankton.

In contrast, regions of low plankton concentrations have much improved vis and appear as a rich blue colour since the blue light is being preferentially scattered by the 'clear' water. Where there is sufficient food (nutrients), there will be good plankton growth, whereas regions of low nutrient concentrations have correspondingly low

production. However, the 'pulsing' of upwelling on the west coast, and resulting 'pulses' in nutrient levels lead to 'blooms' of phytoplankton following the arrival of cold upwelled water. These phytoplankton blooms are then responsible for the greenish colour of the water and the poor visibility that tends to occur following an upwelling event. On a global scale, low productivity, good visibility and clear blue water occur near the equator, while higher productivity with greenish waters and poorer vis are found at the mid-latitudes.

It is important to note that other particles also affect ocean colour and visibility – dead plant matter tends to be very reflective of yellow, and therefore coastal waters sometimes appear a 'yellow-greenish' blue. When blooms occur of certain phytoplankton that reflect red light particularly well, the resulting colour of the ocean is termed a 'red tide'. While in regions where there are large inputs from rivers (such as along much of the east coast), the mud and silt contained in the water reflects (scatters) light, giving the water its murky appearance and severely restricting visibility (particularly after storms, which increase river runoff).





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The oceans are dying

"Only two things are infinite - the universe and human stupidity - and I'm not sure about the former." - Albert Einstein (1879 - 1955)

I don't believe in Earth Day. I think it's silly to devote a single day of the year to being concerned about the environment, but then again, I suppose one day is better than none at all.

The issue now is global warming. When we were trying to warn people about global warming and climate change twenty years ago, no one was interested. Now it's become the "in" issue

and the big organizations are tapping the public for donations to address the problem, although no one has come up with anything that makes much sense so far. Global warming has become a money-maker for the big bureaucratic organizations whose primary concern is simply corporate self-preservation. Greenpeace is telling people they can slow down global warming by singing in the shower - I kid you not! All you have to do is run the water, get wet, shut the

water off and sing in the shower as you lather up, before opening up the faucet and rinsing off. So all along it was just that simple to save the world!

One of the major problems is that the big organizations are too politically correct to address the ecologically correct solutions. Instead, they are baffling everyone with abstract concepts like carbon trading and carbon storage or trying to sell us a new hybrid Japanese car. But let's look at the number one cause of global greenhouse gas emissions - human overpopulation. It's the very same issue that was the priority concern at the 1972 United Nations Conference on the Environment in Stockholm. Today the world's population stands at 6.5 billion. That's a lot of people!

In 1950, the world population was 3 billion - that figure has now more than doubled. Six-and-a-half billion people produce one hell of a lot of waste and use an unbelievable amount of resources and energy. And this number is rising minute by minute, day by day, year by year. Most of the people having children these days have no idea why they're even having children other than "it's what you do". Many of these people don't love their children, and those who say they do, aren't actively trying to ensure their children have a world to live in one day.

Unless over-population is addressed, there is absolutely no way of slowing down global greenhouse gas emissions. But how do you do that within the context of an economic system that requires larger and larger numbers to perform the essential task of consuming products? Corporations need workers and buyers. Governments need tax-payers, bureaucrats and soldiers. More people mean more money.

There are three laws or principles of ecology that can be looked at. First is the Law of Diversity - the strength of an eco-system lies in the diversity of the species within it. If you weaken the diversity, the entire system will be weakened and will ultimately collapse. Second is the Law of Interdependence - all of the species within an eco-system are interdependent. We need each other to survive. Thirdly is the Law of Finite Resources - there is a limit to growth because there is a limit to the carrying capacity.


The human population is exceeding the ecological carrying capacity. This is leading to the diminishing of both resources and the diversity of species. This in turn, is causing serious problems with interdependence. Albert Einstein once wrote: "If the bee disappeared off the surface of the globe, then man would have only four years of life left. No more bees, no more pollination, no more plants, no more animals, no more man."

It's that simple. Humans are holding onto our place on earth by our fingertips. For example, should something happen and there was no more grass, we would be screwed. That would mean the earthworms would disappear and then so would the bees. According to Einstein (who was somewhat smarter than most of us), we would then only four years left. That's just enough time to get a university degree and discover that everything you've just learnt has become totally useless because you are sitting on the doorstep of total global ecological annihilation.

We are cutting down forests and plundering the oceans of their creatures. We are polluting the soil, the air and the water and we are rapidly running out of fresh water to drink. The oceans have been abused to the point that 90% of the fish have been removed from their eco-systems and at this very moment there are over 65000km of long lines in the Pacific Ocean alone. Tens of thousands of fishing vessels are scouring the seas in a rapacious quest to scoop up everything that swims or crawls. This is ecological insanity.

Strange as it may sound, the largest marine predator on the planet right now is the cow. More than half the fish taken from the sea is turned into fish meal and fed to domestic livestock. Puffins are starving in the North Sea so that sand eels can be fed to chickens in Denmark. Sheep and pigs have replaced the shark and the sea lion as the dominant predators in the ocean and domestic house cats are eating more fish than all the world's seals combined.

We are extracting up to sixty fish from the sea to raise a single farm salmon! The demand for shark fins is rising in China. Ignorant people still want to wear fur coats and in America, we order fries, a cheeseburger and a "diet" coke. All I see is a bunch of arrogant primates who are out of control.

Consider the humble honey bee and remember that this little black and yellow insect that's busy flying from flower to flower is all that stands between us and our demise as a species on this planet. We had better see to it that they don't disappear. 



Asthma and Diving

In this short article, DAN describes the nature of asthma and some aspects of its treatment as well as a review of current thinking on this issue in the dive medicine community. Keep in mind, however, this is still a hot topic – with a substantial amount of controversy – even among diving medical specialists.

Whether you have asthma or another medical condition, the consideration and acceptance of the risks involved in scuba diving should be an informed decision. This article provides basic information on where you can obtain additional guidance on asthma – for yourself, for prospective divers and for personal physicians.

Overview

The topic of asthma and diving has long been a controversial subject in the recreational diving community. Traditionally, divers with asthma have been excluded from diving.

Asthma is a disease characterised by narrowing of the breathing tubes (bronchi) in response to a variety of stimuli. It is not a fixed response, and a patient can have a sudden worsening in lung function, called an 'attack'. An asthma attack can be triggered by pollen and other so-called 'allergens', such as cold air, irritants in the atmosphere, colds or flu.

The bronchial narrowing in asthma has two effects: the first is to decrease the amount of air that can be moved in and out of the lungs. This can reduce exercise capacity – especially for a diver who already has reduced breathing capacity due to the external resistance of his breathing apparatus and the increased internal resistance due to higher breathing gas density at depth. Secondly, reduced airway caliber could cause trapping of gas in the lung during ascent. If trapped gas expands at a rate greater than it can be exhaled through the narrowed airways, lung rupture can result, causing arterial gas embolism or pneumothorax (collapsed lung).

Another related concern with asthma and diving has been the increased propensity of airways in asthmatics to narrow when exposed to the conditions implicit in diving: inhalation of cold, dry air and/or sea water (the latter by losing the mouthpiece or from a leaky regulator). Dr. Mark Harries from the British Medical Olympic Center has pointed out that asthmatics who dive are at risk from exercise limitation, not just peripheral gas-trapping. While exercising on land it is easy enough to stop, rest and catch one's breath, while this may not be possible underwater.

Discussions on diving with asthma

What do dive physicians think about diving with asthma? This subject has generated much discussion worldwide, and many physicians hold opposing viewpoints. Perhaps the most liberal guidelines are from the United Kingdom, which states that well-controlled asthmatics may dive – within two guidelines:

- * Provided they have not needed a bronchodilator within 48 hours.
- * If they do not have cold, exercise or emotion-induced asthma.

In Australia, the most conservative country in this respect, all divers are expected to pass a spirometry (lung function) test, to exclude asthma, prior to certification.

As a general overview, DAN statistics show that several divers with asthma have died. It is unclear though, from examination of their accident reports, whether asthma was actually the cause of death or merely an unrelated finding. Data from the British Sub Aqua Club (BSAC) indicate that few divers die with asthma or as a result of asthma.

In addition to DAN's own research, the issue of diving with asthma was discussed at the 1995 annual meeting of the Undersea and Hyperbaric Medical Society (UHMS), the international organisation comprised of diving physicians from around the world. The symposium "Are Asthmatics

Fit to Dive?" was an important agenda item at that meeting.

On the general assessment of the risks of diving with asthma, the South Pacific Underwater Medical Society (SPUMS) has stated that diving may precipitate an asthma attack. Asthmatics are at risk of shortness of breath, panic and drowning on the surface.

Information from the DAN database on divers with asthma suggests that there may be a slight increase in the risk of decompression illness, but there are insufficient numbers as yet to assess the risk accurately.

The incidence of asthma in the general population is approximately 4-5%. Records indicate that about the same percentage of the diving population has asthma, whether or not they admit so on their diving medical forms. It appears then, that a percentage of divers with asthma are diving safely. Bear in mind that this only represents divers who took up diving against medical advice, and who probably have mild asthma only. The true risk for all asthmatics may well be significantly higher than is currently appreciated by the statistics.

The treatment of the four forms of asthma is relevant in determining its severity (see below) and therefore the associated risk of diving. According to UHMS discussions, the first three types of asthma (mild, intermittent and mild-to-moderate persistent asthma), if well-controlled, may allow carefully selected divers to continue diving.

Categorising risks

The next question involves assessing a diver with asthma, with these two qualifications:

- * Is the asthma of a mild nature; or
- * Is the treatment working sufficiently to prevent an acute asthmatic attack while underwater or on the surface?

If the treatment regimen can return the pulmonary function tests to normal, especially those taken post-exercise, divers may be safe to dive and undergo the severe exercise they may need to perform while diving. Potential divers with asthma should undergo both an assessment of lung function and an exercise test to gauge asthma severity. A physician knowledgeable in diving as well as the treatment of asthma might be in a position to offer the best advice.

One consistent theme from all the medical agencies involved was the lack of good information about asthma and diving. DAN is presently working on an assessment of the whole issue. They hope to develop guidelines as to whether individuals with asthma can dive safely and under what circumstances. The best source to help you decide on the issue of diving and

asthma for yourself is your physician.

Classifications of asthma in the United States

Some new classifications have come from the National Institutes of Health (NIH) on the diagnosis and treatment of asthma. Originally presented by Dr. A.J. Torre, a member of the National Faculty of the National Asthma Education Program (a NIH program) to the UHMS, the NIH classifications include these four categories.

Mild intermittent asthma

Signs and symptoms: Clinical features occur less than once a week and are associated with less than a 20% decrease in peak flow (the maximum rate of air flow during expiration). This type of asthma shows brief increases in the severity of symptoms (called exacerbation), lasting a few hours to a few days. Nocturnal symptoms occur less than twice monthly, and between acute attacks the patient should be asymptomatic with normal lung function.

Treatment: Intermittent use of short-acting bronchodilators on an as-required basis.

Mild persistent asthma

Signs and symptoms: Peak flow should be near normal, with less than 20% variation, symptoms occur more than once weekly. Exacerbation affects sleep, with nighttime symptoms often appearing more than twice monthly.

Treatment: Short-acting bronchodilators during the day and long-acting at night.


Moderate persistent asthma

Signs and symptoms: Symptoms, even a cough, can occur daily and often interfere with activities or sleep. Persons with moderate persistent asthma may require a short-acting bronchodilator. Peak flow is generally between 60 and 80%. Ironically, many patients with these symptoms do not believe they have asthma. Coughing with exercise or at night is an important symptom and a very likely indicator of this type of asthma. Treatment: Daily medication, usually inhaled steroids, is required and may require short-acting bronchodilators for acute episodes.

Severe persistent asthma

Signs and symptoms: Persons with this type of asthma have continuous symptoms and peak flows of 60% of normal or less. An increase in symptom severity occurs frequently, limiting physical activity, and nocturnal symptoms occur frequently.

Treatment: Long-acting bronchodilators and oral steroids are required as well as bronchodilators in the acute episodes.

SOURCES FONT: DAN Assistant Medical Director Guy de Lisle Dear, M.B., FRCA, is also Assistant Professor of Anesthesiology at Duke University Medical Center. 

Global News

3D- Printing helps Marine Life

A 3D-printed beak has been fitted to a sea turtle injured by a collision with a boat's propeller. The beak, made of medical-grade titanium, replaces the loggerhead turtle's jaws, half of which were sheared off in the accident.

Detailed scans of the injured creature's head were used to generate the design of the prosthetic beak.

If the prosthetic is not rejected by the turtle, the animal will be returned to the sea shortly.


The 45kg (99lb) creature was taken to the sea turtle Research, Rescue and Rehabilitation centre at Pamukkale University in Denizli, Turkey soon after being found badly injured at sea.

Initially staff at the centre nursed it back to health by feeding it by hand but realised another solution was needed if the turtle was ever going to be able to fend for itself.

The rehabilitation centre contacted Turkish company BTech Innovation, known for custom-making medical prosthetics and implants for humans, to see if it could help.

BTech used CT scans taken by vets to produce a design that fitted perfectly to the injury site and restored the turtle's ability to feed. The turtle, named Akut-3, is currently convalescing at the recovery centre to ensure that it has adapted to its metal jaw.

Cleopatra the tortoise has also been equipped with a 3D-printed part. The animal is not the only reptile to have benefitted from 3D printing recently.

In March, a tortoise in Denver was made a customised prosthetic plastic shell by a student at Colorado Technical University, after her original one had deteriorated due to a poor diet. 



B-29 Bomber in Lake Mead Now Open For Diving

The B-29 Bomber. Credit: Lake Mead Parks Service

If you've been interested in diving the B-29 bomber in Lake Meade, now's the time. The National Park Service has selected Tech Diving Limited to conduct guided tours of the wreckage under a two-year contract, and the first dives will take place this Friday.

During the 2- year period, Tech Diving will be allowed to take no more than 200 divers down to the B-29, which rests at a depth of about 115 feet, thanks to near-record low conditions in the lake. When it was last open to divers seven years ago, it was at approximately 160 feet deep and only available to tech divers. Tech Diving led tours to the wreck the last time the Park Service allowed guided tours of the site in 2007 and 2008.

Only experienced divers will be able to dive on the wreck, and divers must be certified in Advanced Nitrox.


A Dive Day on the B-29 includes an educational orientation about the B-29, transport to the B-29 Overton Dive site, a guided tour of the B-29 dive site with up to 45 minutes on the bottom (gas supply permitting) (CCR welcome), a surface interval and a 2nd dive on the B-29 if scheduled. Lunch, soft drinks and snacks are included.

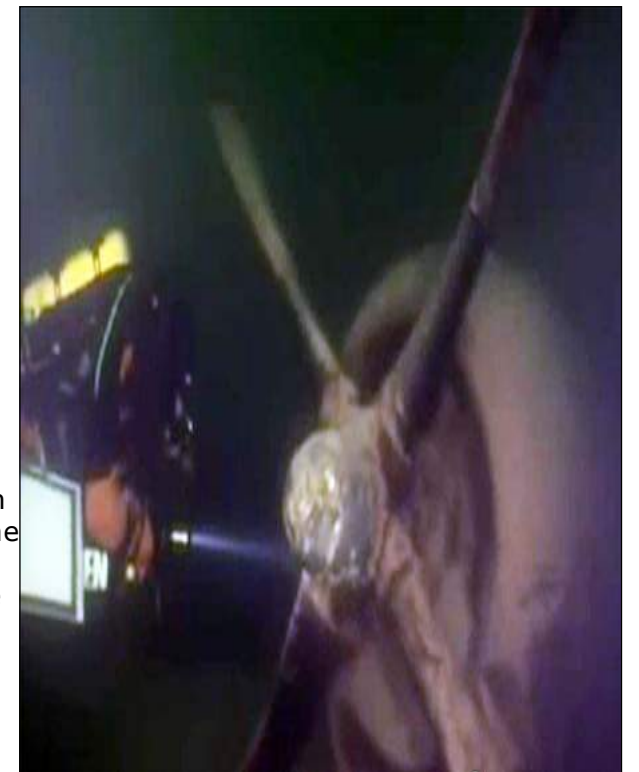
The B-29 crashed in Lake Mead's Overton Arm on July 21, 1948, during a mission to test a secret ballistic missile guidance system. All five crew members survived, but the bomber was lost until August 2001, when local divers discovered it sitting upright and mostly intact on the lake bottom.

After two years of allowing divers on the bomber, the permits were not renewed in 2009, partly because the "purveyors of underwater adventure" struggled to turn a profit on the dive trips. The outlook is looking better this year – the company is partly booked through October.

Dive trips will be launched out of Lake Mead's Echo Bay, about 60 miles east of Las Vegas. There will be no more than one guide and one or two tourists making each trip to the bomber.

Conditions at the site are dark and cold but relatively clear, and water temperatures are in the 50s with 30 to 50 feet of visibility. With the lake as low as it is, Silverstein said, "there is a fair amount of ambient light penetrating the water," but those who make the dive will also need to carry multiple flashlights.

For more information on diving the B-29, visit <http://www.techdivinglimited.com> 



Indonesia sinks 41 illegal fishing boats, including one from China

JAKARTA — Indonesia yesterday sank a large Chinese vessel as well as 40 other foreign boats that had been caught fishing illegally in the country's waters, a move likely to spark a strong reaction from Beijing and other regional capitals.

The 300 gross tonne Chinese vessel was destroyed with a low-explosive device on its hull in West Kalimantan, said Maritime Affairs and Fisheries Minister Susi Pudjiastuti.

"This is not a show of force. This is just merely (us) enforcing our laws," Ms Susi was quoted as saying by The Jakarta Post.

The Gui Xei Yu 12661 is the first Chinese boat to be sunk since Indonesian President Joko Widodo declared war on illegal foreign fishing boats last December.

The Indonesian Navy detained Gui Xei Yu in 2009 after it was caught fishing near the South China Sea, a hotly disputed area involving China and South-east Asian nations such as Malaysia and Vietnam.

Besides the Chinese ship, the authorities also destroyed 40 other vessels in different places across the country. They included five boats from Vietnam, two boats from Thailand and 11 from the Philippines, The Post reported.

Shortly after assuming office last October, Mr Widodo launched a campaign to protect Indonesia's maritime resources and domestic fishing industry, which loses billions of dollars in revenues to illegal fishing each year. He has also pledged to transform Indonesia into a maritime power and, in December last year, orchestrated a much-publicised sinking of three empty Vietnamese vessels.

Dozens of foreign vessels from Malaysia, Thailand, Vietnam, Papua New Guinea and the Philippines have been sunk in recent months.

Ms Susi yesterday hailed the latest sinking of the 41 fishing boats, saying it was part of the government's efforts to protect Indonesia's maritime resources.

"The action was taken after legal proceedings for the foreign vessels were completed," she said.

According to Ms Susi, the sinking served as a good lesson in deterring foreign vessels from fishing illegally in the country's waters. She added that it also served an indirect purpose in improving the welfare of Indonesian fishermen as well as protecting the country's territorial sovereignty.

Antara News quoted a senior official as saying that the sinking of the ships was held at the same time in several areas across Indonesia, and coordinated by the Maritime Affairs and Fisheries Ministry, the coastal police and the navy.

"This is to revive the National Awakening Day and as symbol of the rise of the world maritime spirit," said Mr Asep Burhanudin, director-general of resources surveillance at the Maritime Affairs and Fisheries Ministry, who yesterday oversaw the destruction of vessels in North Sulawesi.

May 20 is National Awakening Day in Indonesia and marks the rise of Indonesian unity and nationalism. Observers expect China to react strongly now that one of its vessels has been sunk. It could potentially lead to a diplomatic spat, which Jakarta has so far largely avoided with Malaysia, Thailand, Vietnam and the Philippines after it destroyed their vessels.

<http://www.todayonline.com>



New species of heat-tolerant algae.

A new species of heat-tolerant algae gives hope to the future of coral reefs as water temperatures across the world rise.

A collaborative study between the University of Southampton and the University of New York Abu Dhabi found that the new algae species (*Symbiodinium thermophilum*) discovered in the Southern Arabian Gulf helps corals survive in waters as warm as 36 degrees Celsius, temperatures considered to be lethal to corals.

'It gives hope to find that corals have more ways to adjust to stressful environmental conditions than we had previously thought,' Jörg Wiedenmann, Professor of Biological Oceanography at the University of Southampton and co-author of the study said.

Speaking to DIVE, Associate Professor of Biology at NYU Abu Dhabi and co-author of the report, John Burt, said, 'The Arabian Gulf is one of the most thermally extreme seas in the world, so we expected that we would find some interesting coral-associated algae (zooxanthellae) on these reefs'.

Surprisingly, the type of algae found to dominate the Arabian corals are part of a group of algae which is not expected to survive in warm temperatures.

'It had evolved and adapted in the Gulf's unique environment to such an extent that - by several lines of evidence - it had evolved into a new species', Burt explained.

Most reef-building corals are dependent on the symbiotic relationship with these microscopic algae. In return for nutrients and shelter, photosynthesis allows algae to produce sugars vital for the coral's diet and are responsible for the coral's pigmentation. However, this symbiotic relationship is extremely delicate to changes in heat. Under heat-stress, a coral might expel its zooxanthellae, the phenomenon known as coral bleaching, which leaves the white coral skeleton to starve.

'However, it is not only heat that troubles coral reefs,' he added.

'Pollution and nutrient enrichment, overfishing and coastal development also represent severe threats to their survival. Only if we manage to reduce these different forms of stress will corals be able to benefit from their capacity to adjust to climate change.'

The study was published in Nature.

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FORGET FROGFISH PNG

Frogfish have a certain appeal. Maybe it's their lumpy cellulite appearance and their awkwardness that I identify with. Maybe its admiration for their ingenuous and effective yet lazy feeding technique. Or perhaps even jealousy of their ability to adapt their looks to match their surroundings? Whatever the reason, I have this fascination to find them. ∞



By Jeanne Liebetrau and Peter Pincock

I was informed by reliable sources that Milne Bay, Papua New Guinea, is one of the best places to see them. But I found that Milne Bay has so much more to offer - both big and small, that I soon forget about frogfish.

Situated north east of Australia, Papua New Guinea is well known for its excellent dive sites. Milne Bay in particular, is renowned for muck diving, cryptic critters and weird sea creatures. Milne Bay is flushed with nutrient rich water from the Coral Sea and the Solomon Seas. It boasts more islands than any other province in Papua New Guinea. Typical of the country though, it is remote and only accessible by sea or air. The only way to explore the area is by boat. Mike Ball's 'Paradise Sport' liveaboard departs regularly for 6 or 9 day trips from Alotau, the administrative capital of Milne Bay. In Alotau's small harbour, ferries (the main transport to outer islands) and small fishing boats interspersed with wooden outriggers are the only form of local transport. Paradise Sport dwarfs these vessels as she moors

alongside, creating quite a stir for the local population.

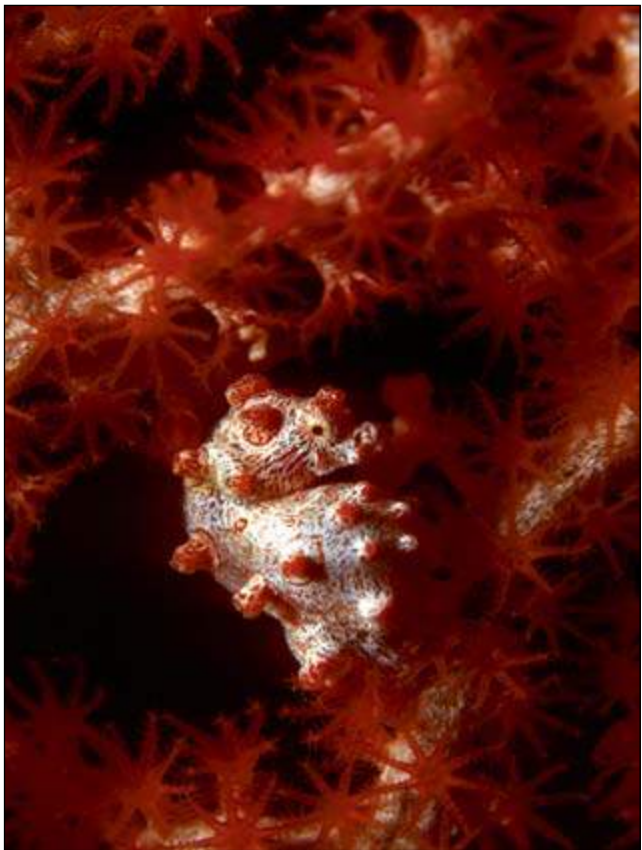
I listen carefully to the first dive briefing. The Muscoota is a 4 mast sailing clipper that broke sailing records in her heyday. During the war she was converted to a coal supply ship. Whilst refueling alongside another ship, both the ships surged together in heavy seas damaging the Muscoota. To enable repairs in the shelter of Discovery Bay the Muscoota was moored to the beach. However the gantry wasn't properly secured and slipped backwards unbalancing the boat further. She sank right there - still moored to the shore. "In the deeper part of the wreck lives a resident wobbegong shark. We have seen numerous demon stingers and look out for frogfish" cites the dive director. On that word of advice we plunge in. The almost sheer steel sides of the wreck bear little coral growth but are covered in encrusting sponges. A school of juvenile razor fish zigzags amongst the fronds of a gorgonian



fan on the bow, forming an optical illusion as they flash in and out of sight. Pipefish and gobies traverse the sponges in search of food while the voracious predator, lizardfish, wait for an error in their judgement. The decks are a mass of twisted metal. Broken pylons are carpeted with soft corals and anemones. Spine cheek anemone fish vie for accommodation. I find no frogfish but admittedly spend ages watching exquisite mandarin fish who have adopted the coal bunkers as their sanctuary. The dullness of the coal emphasizes the brilliance of their colouration. Mandarins are arguably the world's most beautiful fish, yet they are seldom seen to be appreciated.

Samurai Island is the old administrative capital. Freighters and liners once berthed at Samurai wharf. Today the rusting pylons are a haven for critters and a myriad of fish, including frogfish. I scan the pylons finding pipefish - scribbled, double ended, guilded and the imposing red ringed pipefish. I search the rubble and find lionfish, octopus, shrimp goby combos and hundreds of lizardfish. Out the corner of my eye I notice a nudibranch that is behaving as if it's on speed. In fact it's a juvenile pinnate batfish only 5cm big. The mimicry is amazing but this tiny fish doesn't stop wriggling for a second, making photography a challenge. Once again I am distracted by the plethora of life but don't find any frogfish.

Nearby Samurai Island is the dive site "Giants at Home" - a manta cleaning station. A host of extraordinarily robust cleaner wrasse inhabits two ordinary coral outcrops on a sandy slope. "Up to 12 mantas have been seen on a dive", the crew assures us. This message goes through my mind numerous times as I sit on the sand waiting patiently for these gentle giants. Just as I was beginning to feel rather silly just sitting there, a manta passes briefly overhead. This is enough to convince me that this could well be a manta hang-out. For the next hour nothing happens. The other divers surface. Another 30 minutes pass. A robust pipefish wafts amongst some reeds. I have a camera lens for big fish so I ignore it. The light dims abruptly. I look up. Above me is a manta with a wingspan of at least 5m. The cleaner fish race into action as customers for their beauty salon arrive. Two more mantas arrive, one is the Darth Vader type with all black underneath and the other is white with black paw print markings. The mantas swoop and soar for 20 minutes. The personal hygienists flit about the gills and briskly inside the voluminous mouths. Then as suddenly as

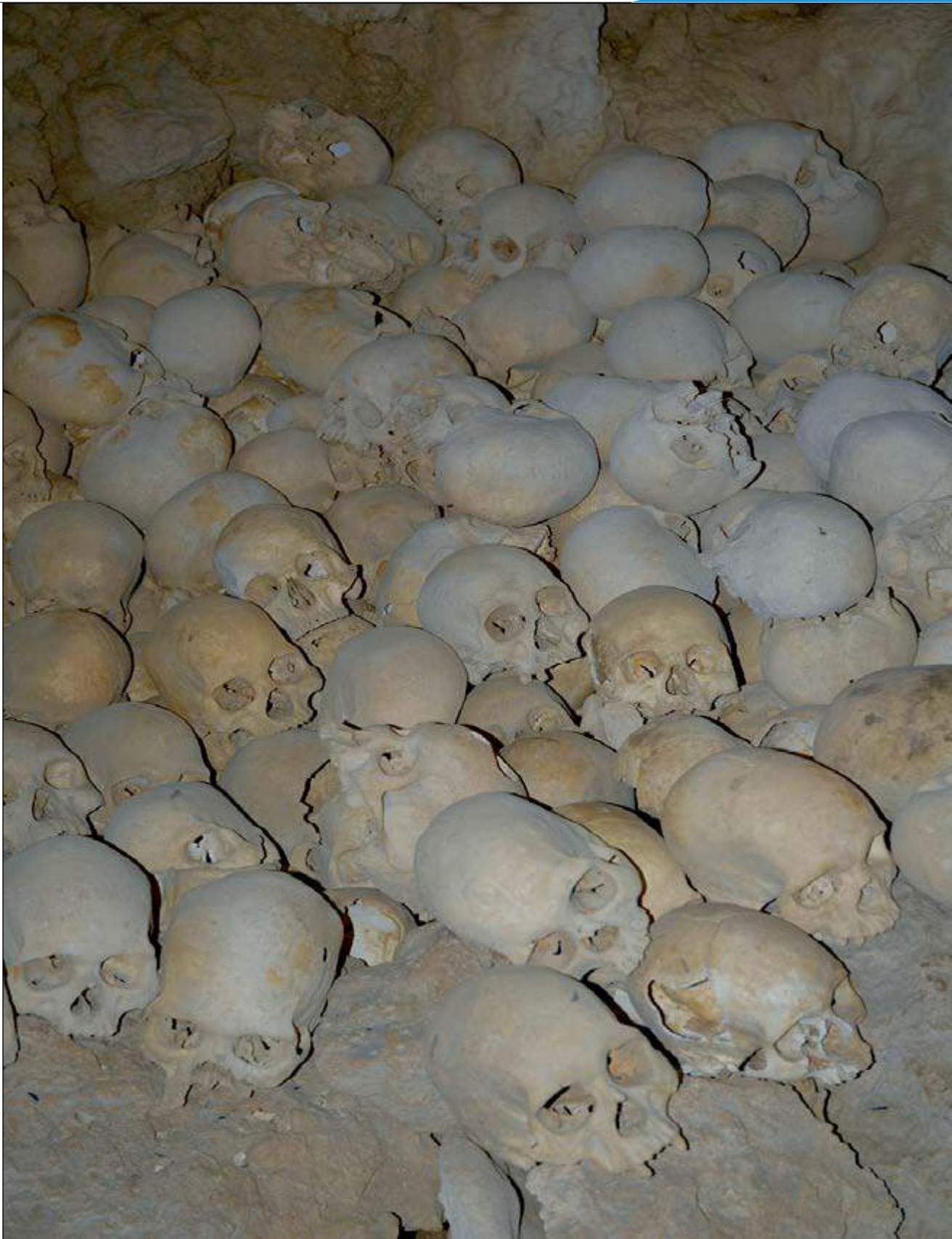


PNG

By Jeanne Liebetrau and Peter Pinnock



PNG



PNG

By Jeanne Liebetrau and Peter Pinnock

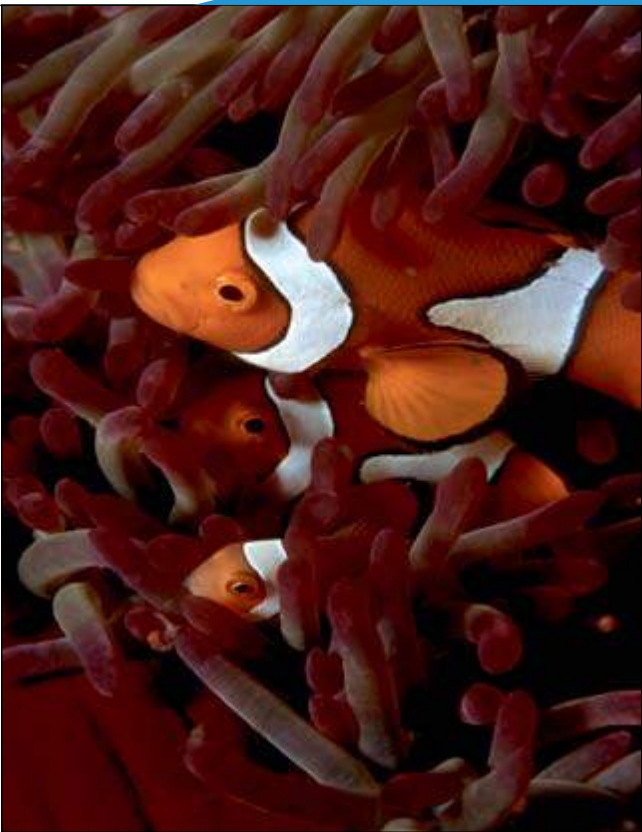


the mantas appeared they disappear into the distance. I check my gauge and do a double take when I realize 125 minutes have passed - the cleaning station is in only 9 m of water.

Mantas aren't the only winged giants to be seen in Milne Bay. The wreck of the B17 Flying Fortress Bomber is just as impressive. Nick-named "Black Jack" as her serial number ended in 21, she now lies in 45 m of water. Black Jack is almost intact, only the nose cone is damaged from the impact on the sand. Reputedly the pilot, Ralph de Loach, experienced engine problems on route to Rabaul on a bombing mission. He managed to drop the bombs on target but laboured home running out of fuel, getting lost in bad weather and finally crash landing off Boga Boga village. All passengers survived and were rescued by villagers. Paradise Sport crew are very safety conscious on this deep dive. Back up divers and reserve tanks are on hand. From 20m the wreck takes shape as the 32m wingspan stretches out across the sand. Driven by 4 engines and carrying 10 crewmembers plus a heavy cargo of bombs, this is understandably a huge plane. The rear gun turret is still mobile and the 4 props are intact although some blades are embedded in the sand. It is possible, but not encouraged, to enter the cockpit (trapped air will expedite the rusting



PNG



process). It takes precious minutes to swim the 22m length of the plane. Dive computers shriek indicating time to ascend for staged safety stops. At each stage we continue to look back at this vessel of destruction that is now being corroded by time and nature.

Back on my mission to find frogfish we head to Dinahs Beach, a muck dive site. The family of Dinah Halstead, a pioneer of diving in Papua New Guinea, own Laudi village where Dinah's is located. As Paradise Sport tethers to palm trees on the beach the dive brief continues. To the one side is Deacon's Reef and on the other is Dinah's Beach. It is possible to dive both in one dive but not if you stop to take in the beauty. Since Dinah's is good for a night dive we head for Deacons. The splendour of this reef blows me away. Pillars of reef lavishly decorated with soft corals shelter mini lagoons where giant ignoblis kingfish chill out. Pink and red gorgonian fans bar the entrances to these lagoons. Smaller iridescent yellow kingfish feed frenetically on schooling glassies on the outside of the reef and striking orange clown fish nestle inside delicate pink tipped anemones. It's a magnificent kaleidoscope of colour.

Finally the night dive on Dinah's Beach arrives.



PNG

By Jeanne Liebetrau and Peter Pincock

Heading across the black sand slope I find a large, perfectly symmetrical hole. Turning my torch light away I wait to see who the architect is. Moments later a huge mantis shrimp peeps out. The mantis scrutinizes me, one eye constantly surveying the slope like a chameleon. Deciding I am not a threat, it leaves its home and scuttles to a nearby reef to forage. Adjacent to a rocky outcrop 2 lionfish are behaving strangely. I can't fathom whether it is a territorial fight or a sexual encounter. The lionfish face each other as if in a fencing match. As their jaws open to full extent and the pectoral fins are spread out, the lionfish charge at each other. A mock bite is made. They turn and resume their starting positions for another lunge. Another lionfish displays its pectoral fins and nips under a ledge. Its 'fu manchu' -alias twinstripe lionfish, a predator that is almost as shy as the mandarinfish. These fish seem to have an identity crisis.

Black and Silver reef is another quintessential reef. On one side of this seamount is a plantation of silver or orange coloured black coral trees. Glassies swarm around the coral bushes. Trumpetfish hide amongst the fronds where they carefully select and grab an unsuspecting glassie. Kingfish and jacks plough through the swarm creating havoc as they stun their prey. Barracuda

and tuna patrol in the distance. Colours splash across the reef as anthias cast oranges and purples, fusiliers flash blues and greens and sweetlips radiate yellows. On the other side of the seamount 2 hawksbill turtles are unperturbed by the hive of activity. All they are interested in is a rest and some delicious sponges to munch on.

My last chance for frogfish is Observation Point on Normandy Island. This is another sandy slope bordered by reefs with sea-grass bed in the shallows. An ugly demon stinger staggers slowly across the sand disturbing a peacock flounder. A clump of sea-grass reveals a cleverly camouflaged filefish in pure green. Nearby a snake eel keeps dead still, only its head sticks out of the sand. I head towards the sea-grass bed. A school of razor fish is moving through the grasses. A cockatoo waspfish resembling a dead leaf sways with the tide. A rust coloured seahorse moves slowly in 80cm of water curling his tail around small sticks. I can feel eyes at the back of my head. I swing around. 2 squid have me in their view. Luminescence flickers across their bodies as they contemplate my presence. Do they know what I am looking for? Do they know where the frogfish are? Their alien eyes glimmer and flicker but tell me nothing. I finally give up the frogfish quest.



PNG



By Jeanne Liebetrau and Peter Pinnock



Info
How to get there
Fly via Singapore to Port Moresby then on to Alotau

Currency
– Kina

What to look out for:
Wall Diving, world war 2 wreck diving, exotic creature diving. Marine Life on sites includes razor fish, wobbegong shark, anemone fish, Mandarin fish, lionfish, octopus, shrimp, gobies, kingfish, mantis shrimps, Trumpetfish, Barracuda, tuna, turtles, snake eels, seahorse, squid, Sharks and manta rays.

Depths on dive sites
10-45M

Water temperature
25-28 Degrees

Accommodation
Liveaboard on Paradise Sport

Best time to dive this site
September to April



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A distant corner in Bali

The long blue and white wooden perahu chugs out of the protected bay in front of Mimpi Resort and heads into slightly choppy waters. The boat lifts a fine sea spray which is a welcome relief from the heat of Bali.



By Jeanne Liebetrau and Peter Pincock

Ahead a similar perahu is full of happy snorkelers and behind us another has a congregation of Hindu worshippers. The skipper steers with one hand only as he is engrossed in conversation with the crew. He has made his offerings to the Hindu gods at his temple on top of his perahu and knows we are safe. We are in absolutely no hurry to reach Menjangan Island, far from the maddening hustle and bustle of city life, far from thousands of scooters and even further from the rush of tourists and T-shirt sellers. This is the quiet north-west corner of Bali, a place to relax and chill out.

Menjangan Island National Park is protected by mainland Bali, currents are rare and the visibility is crystal clear. The island is surrounded by walls reaching depths of 30-60m. The snorkelers and the devotees head towards a jetty on a small wind protected beach while we head for Eel Garden on the eastern side of the island. Putu, our dive guide, assures us that diving in these parts is leisurely and relaxed, we can dive any depth and in any direction. Eel Garden starts with a dive on a steep wall. In gin clear water



large pink gorgonian seafans and soft corals are juxtaposed along the wall. Bushy crinoids balance on the rims of sturdy barrel sponges and featherstars are furred deep in the grooves. Clumps of red seawhips waft gently in the breeze. In the calm water, fish swim languidly in no particular direction.

The serenity is broken by a school of blue-fin



kingfish speeding past us. The kingfish break formation, plummeting towards a soft coral outcrop scattering thousands of schooling glassies. The kingfish regroup as they head towards the surface and then return for another assault. Below the corals a lazy scorpionfish is on high alert – seizing glassies straying in his direction. Excited by the action, a coral rockcod rushes in to take a few gulps of the glassies which are now herding together.

In the shallows a sandy slope is pitted with tunnels, home to the grumpy looking jawfish and timid Garden eels. Putu beckons us to a large coral bommie. He points to a darkly coloured crinoid. One of the arms appears to be detached and is swimming freely. We scrutinise it more closely and find it is a juvenile male Harlequin ghostpipefish. Putu tings loudly on his cylinder with his pointer. Irritated, we turn to see why he is making a noise. He has found another two male pipefish hiding within a small sea fan. Fascinated by these rare fish swimming vertically, mimicking the crinoids, we settle down to take photographs. Putu tings again. We both look up



to see what he has found this time. He proudly points out another male and a large female. I am astonished – five Harlequin ghostpipefish on just one coral bommie! As we wait for the male and female to pose perfectly for a photograph, Putu tings again. I swim over to investigate, but I am disgusted to find he is calling us for a common nudibranch on a sponge. From thereon we ignore his tings.





By Jeanne Liebetrau and Peter Pinnock

In between dives we relax on Menjangan Island. The Hindu devotees are placing offerings of fruit and incense at one of the five temples on the island; the snorkelers are floating in the water at the end of the jetty and a wild deer grazes a few metres from sun worshippers. The atmosphere is very relaxed. Putu calls us for a dive on Coral Gardens on the west of the island. We swim a short way along a wall until we reach a large expanse of shallow water littered with coral bommies. We find a crimson crinoid shrimp that has vacated the sanctity of its host's feet and is crawling openly along one of the arms. Tickled by the movement on its sensitive hairs, the crinoid curls its arm inwards but the shrimp hops onto the adjacent arm and scuttles along the length to the tip.

There is excellent diving both to the east and west of Menjangan. To the east lies Puri Jati, a sheltered bay that has evolved from being a fishing village to becoming a popular dive site recognised for its unusual fish species. It has an easy shore entry from the beach – the first 30m of black sand slopes gently down to 6m depth. This moonscape is seemingly devoid

of life. We swim over hundreds of thumb-size corals dispersed across the slope. We pass over meadows of short sea-grasses as we search for strange and unusual creatures. Longspine urchins congregate in patches and their pansy shell skeletons lie scattered over the reef. As we reach the deeper water we find many sand anemones hosting a variety of sea life. A large female anemone shrimp reveals her intestines and clutch of eggs on her see-through body. Nearby, another anemone is swarming with baby damselfish. The damsels are nervously crowding together as they desperately seek shelter in the flat anemone. Something is worrying them. It takes a few minutes before we realise that the adjacent tangle of dirty reef debris is actually a hairy frogfish hunting the vulnerable damsels. We start to look closely at all other bundles of debris and discover more hairy frogfish, juvenile lionfish and flying gunards. A mess of floating reeds and fishing line turns out to be a pair of hairy ghostpipefish. Unlike their relatives at Menjangan, these are drab in colour and swim horizontally in the sea-grass. PJ's certainly offers some weird looking critters.

Putu suggests we go to Secret Bay, as the



conditions are perfect with full moon and an incoming tide in the midmorning. Secret Bay (Gilimanuk Bay) lies 20 minutes to the west of Mimpí near the dock for the ferries that run across the Bali Straits to Java. The sheltered bay is fed cold water from the current ridden straits, making it a sanctuary for juvenile fish. We swim along a sandy bank covered in sea-grass. A large brown seahorse swims awkwardly between grasses, wrapping its tail quickly around blades of grass for support. A thin green pipefish resembling the grass eases itself amid the gently swaying meadow. As the depth increases to 6m the sea-grass dwindles exposing the sandy slope. A motionless snake-eel's head pokes out of the sand. It sinks slowly into its hole as we approach. We disturb a cryptically disguised longtail seamount and it scurries across the sand displaying its wing-like pectoral fins. We stop at a clump of longspine urchins. The spines provide a haven for the exquisite aboriginal art-inspired Banggai cardinalfish.


Years ago divers erected metal cages to encourage hard coral growth. Fish congregate in these rusting metal cages that are encrusted with clams, barnacles and corals. Perched on the



Bali

By Jeanne Liebetrau and Peter Pinnock

struts of one cage a large yellow frogfish tries to lure its prey. Another smaller red frogfish is resting adjacent to a red leaf oyster. Deeper inside the cage we spot a grey giant frogfish and a striped frogfish. Juvenile lionfish swim easily between the struts. A sunken wooden barge is crammed with striped catfish packed so close together they appear to be gasping for breath. The smaller catfish swim continuously in a tight ball formation while the larger catfish rest on the floorboards of the scuttled boat.

Eventually our eyes tire from searching for weird and wonderful creatures and we wade out of the ocean. We have not swum more than 100m in pond-like conditions. The diving is relaxing yet we can't wait to return to Mimpì Resort where a natural thermal hot spring pool awaits us. The water has therapeutic and calming properties, and as we relax in our private pool we imbibe our surrounding zen garden. Frangipani flowers fall into the pool, a ceramic frog guards the pebble pathway and the breeze rustles leaves across the thatch roof. Another slow day in a distant corner of Bali. 



Bali



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DEEP DOWN YOU WANT THE BEST

Sugar Beach Resort

MAURITIUS



Mauritius is always a safe, affordable option if you're in need of an escape. A four-hour flight, almost guaranteed sun, superb resorts, glorious beaches lapped by turquoise blue water – it's almost too good to be true. In February I checked out Sugar Beach Resort – a large resort built in the style of a traditional sugar plantation on a long white sandy beach just south of Flic en Flac. Sugar Beach Resort prides itself on the juxtaposition of plantation-style formality and easy-going charm. Fans whirl from the high ceilings and the buildings, based on the old colonial style with a central manor house and surrounding villas linked by symmetrical palm avenues, are large and elegant. Velvet green lawns provide the space for keep-fit classes, impromptu ball games and kids play areas and there is a large, tranquil lake behind the Fun Kids Club.

The resort is based on the west coast, so enjoys spectacular sunsets. Several special evenings – the seafood extravaganza and

the sega night – take full advantage of the sundowner romance. There are three restaurants, including the cozy, beach-front Citronella's Café, and Mon Plaisir, the main dining room, which conjures up themed buffet evenings – including a very lively, exotic Cuban evening – most nights. The central Plantation Bar, surrounded by the dazzling swimming pool, is the place to dine at lunchtime, with an eclectic menu of everything from fresh tuna to pizza to Mauritian specialties such as chicken curry and wonderful lite bites of sugar prawns and calamari. Guests can also dine at the neighbouring sister resort, La Pirogue.

Mauritius does resort based holidays par excellence – the resorts are so comfortable and well-equipped that there's little excuse to leave. We found a few – a really exciting dive in the Blue Submarine and a trip with White Sand Tours to go quad biking, but otherwise we, like most guests, were



By Fiona McIntosh and Shaen Adey

Sugar Beach

Sugar Beach

happy to enjoy the spoils of the resort. (Though I'd recommend that first-time visitors to the island take a trip north to Mauritius' superb Pamplemousses Botanical Gardens, and stop in to see the Caudan Waterfront in the capital, Port Louis as well). Sugar Beach Resort had the full gamut of activities – free land and non-motorised watersports including unlimited waterskiing, games for the kids (kids from 2 – 12 qualify for membership at the kidsOnly club and teens for clubOne) and, of course, numerous forms of aerobics. There's a gym and spa, and guests can access the new 18 hole golf course on Île aux Cerfs on the east coast.

But what of the diving I hear you ask. Isn't it pretty mediocre? Well there are those that slate Mauritius' reefs – and unfortunately there are some resorts where the dive centre – with its almost captive clientele of resort guests – doesn't show off the island's best. But let me assure you from the start that Sun Divers, the dive centre servicing Sugar Beach and La Pirogue, is NOT one of them. The

professional team go out of their way to convince you that Mauritius, and in particular their stretch of reef on the west coast of the island, offers spectacular diving that will have you coming back for more. Sun Divers is located in the grounds of La Pirogue, from where all motorised watersports for the two resorts are run. The main reefs are a short boat ride away and include some outstanding underwater topography at Cathedral and L'éveille and a fabulous wreck, Tug 2, which is not only a perfect size for exploration and wide angle photography, but is also home to two species of an unusual scorpion fish – rhinopias – one of which is endemic to Mauritius. Then there's another gem and photographer's paradise, Snake Reef, which harbours more venomous fish than I have ever seen on a dive and countless other reefs that divers, and snorkellers will enjoy. The staff spoil you – kitting up your gear, and constantly reminding you that you're on holiday. When you backward roll into that warm blue water and realise that you can see 30m or more you'll wonder why you didn't think of a holiday here before. 🏊



Lust for Rust

- experience wreck diving in Micronesia.

Part II



Of the diveable wrecks in Chuuk Lagoon, not all engine rooms are worth visiting.

The San Francisco Maru is just too deep for recreational divers to do more than goggle at the contents of her holds and the massive kingposts. Due to the cargo of mines, torpedoes, bombs, artillery, munitions, aircraft parts and fuel supplies, she is often referred to as 'The Million Dollar Wreck'. A row of trucks tempts divers to explore deep within her gloomy hold and huge army tanks balance on the sides of the deck. Hemispherical mines are packed neatly in large crates while a menacing bow gun points serenely towards the deep blue. The Amagisan Maru is also too deep to bother with engine rooms – the rusting staff cars and bicycles in her large holds are far more interesting. In shallower water the bow gun may be impressive but by far the most scenic structures are the large kingposts resplendent with marine growth.

The Sankisan Maru was carrying highly flammable weapons when the Allied Forces attacked. The Captain and crew abandoned ship for fear of her cargo exploding. She was never torpedoed or bombed but strafing started a fire that no-one was around to extinguish. The crews' fears were realised as the weapons exploded, obliterating the rear of the ship. We explore the holds in the front of the ship – Hold No. 3 has thousands of medicine bottles which apparently contained morphine. Hold No. 2 has trucks and truck parts that sadly have rusted beyond recognition and Hold No. 1 is littered with small arms ammunitions, many of these cartridges held together in clips.

The oil tanker, Shinkoku Maru, is the second largest wreck in the lagoon. Shinkoku means 'Nation of God' and this engine room was surely a tribute to this god. Inside the vast room I



Wreck Explorations

Lust for Rust

have a feeling that I am on the stage of a theatre production. Sunlight filters through skylights, throwing dappled light onto the many catwalks traversing the room. Ladders and staircases lead up and down to gauges, pipes, dials and wheels. Evidence of the torpedo that caused her demise is in the deepest part of the engine room. With such a large room filling with water there was no way the ship could have been saved.

The ultimate engine room "Fujikawa! Fuji-ka-wa! Fuji-kawa!"

Dan is excited at the next dive and shouts Fujikawa in as many Japanese accents that he is capable of. He shifts his Copenhagen to the other cheek and scratches his head as he contemplates this great dive. The Fujikawa Maru is possibly the most dived and yet still one of the most beautiful and interesting wrecks in Chuuk. One hold contains fuel drums and another has fighter aircraft parts – wings, engine cowlings and fuselages. The passageways make a scenic swim-through past window frames curtained by soft corals.



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The massive stern gun mounted on a circular platform is strangely beautiful thanks to the coral growth and fish life. Chromis, rockcods, damsels and fusiliers have no fear of this once terrifying machine. The bridge houses an intact telegraph indicator and an authentic wok rests on the large coal stove in the galley.

But for Dan, the Fujikawa's engine room is the ultimate. This is entered via the open skylights. Catwalks at various levels crisscross the engine room, and hanging on the distribution board is a gas mask ready for emergency use. Adjacent to the engine room is the much smaller machine room which contains an abundance of vices, lathes and drills. The shelves in the smaller spare parts room are neatly packed with lights and lamps. Dan excitedly points to a weird robot-like machine with big knobs and buttons and corrugated pipes leading out at the sides. This is a compressor designed to pump carbon dioxide into the engine room in the event of fire. Dan shouts into his regulator, "R2D2". His Copenhagen dislodges. He spits it out, grins widely and gives a double thumbs-up sign. Yes, this is the ultimate engine room.

Travel information:

Location: Micronesia, 7 degrees north of equator, south east of Japan.

Language: Chuukese, yet English is widely spoken

Visas: US required for transit via Guam

Getting there: Fly on Continental Airlines via Guam

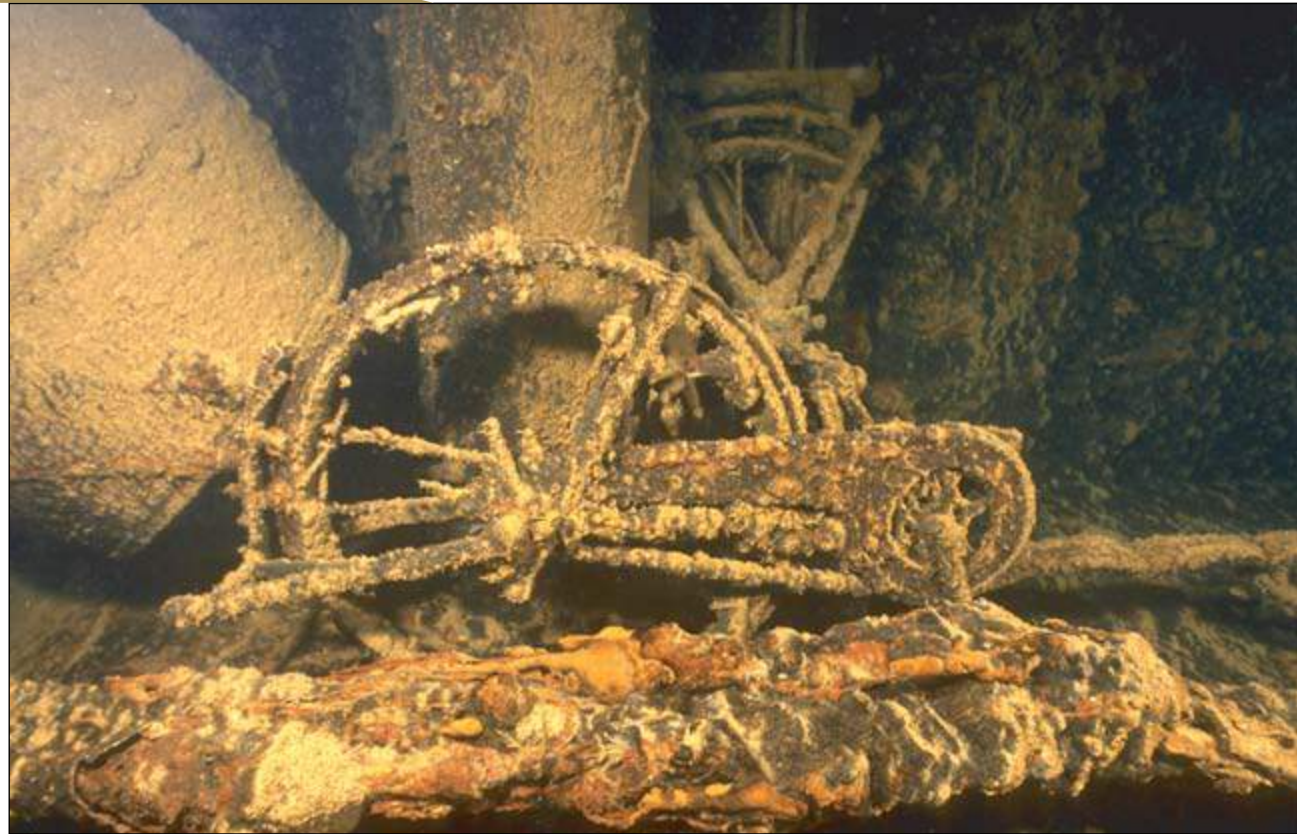
Currency: US Dollar. Not all operators accept credit cards.

Best time to go: The weather is consistent throughout the year, although there is less rain and therefore slightly better visibility from September to April.

Water temperature: 28°C throughout year

For a gallery of images from Chuuk, visit www.peterpinnock.com





Photographic Competition



Cheryl Kroeger



Iain Toomey.



John Davis



Pierre Rossouw



Reg Scully.



Darren Ninham



Nicholas Marchand



John Gill



Tony Brown

How to enter your photograph

Whether you're an amateur or professional photographer, this is a photo competition for all levels of photographers. We're looking for pictures that capture the true experience of scuba diving and the wonders of the underwater world.

Submit your photo!

- Photographs may be taken above or below the water, as long as diving remains the theme.
- The Name of the photograph must be the photographer's name.
- Photographs must not be bigger than 5 MB per photo.
- Submit your snaps in high-resolution (at least 150 dpi) in jpeg format.

Visit www.ozdiver.com.au, click on the "photographic competition" link and follow the steps.



Photo School

Expose it right underwater



This issue we are going to talk about strobe exposure. Using strobes underwater is not as simple as one, two, three but at the same time it is also not rocket science.

No matter where you are taking your photographs in daylight, you will always be working with a combination of artificial light and ambient light. It is therefore of the utmost importance that you understand that ambient light will always affect your exposure in some way. Another very important point to remember is that the subject-to-strobe distance affects the effect of a strobe

on a subject. This distance should be limited to a maximum of approximately 1,2m to 1,5m from the subject. Another point to remember is that a strobe only lights one distance correctly. This basically means that your foreground will be slightly and gradually overexposed and your background will be slightly and gradually underexposed.

Another important factor to remember is the reflective quality of your subject. Subjects that are very dark or less reflective would need more light to expose correctly and subjects that are very light or very reflective would need less light to expose



correctly. There are a few basic ways you can control the effect of the strobe light exposure on the subject:

1. Adjust the strobe-to-subject distance.
2. Adjust the strobe power settings.
3. Place a diffuser over the strobe lens.

The strobe-to-subject distance plays a vital role when trying to achieve the correct exposure. When you purchase your strobe you will receive a strobe exposure chart with it. This is very useful as it provides you with your strobe-to-subject distances at different lens aperture settings. This remains only a guideline and I would recommend that you develop your own strobe exposure charts by experimenting with various strobe power settings and distances for your own underwater set-up. Shoot multiple photographs making small changes to the power, distance and aperture and evaluate your results for the best exposure for each given distance. As a rule of thumb, remember that decreasing strobe-to-subject distance increases exposure and increasing strobe-to-subject distance decreases exposure.

When we talk about strobe power settings, we are talking about the settings on the strobe that are used to change the output power of a strobe. They are often referred to in fractions, but what is important to remember is that every time you select a smaller fraction it reduces the output power by one f-stop. For example:

Full power = total power
 $\frac{1}{2}$ Power = reduces light by one f-stop
 $\frac{1}{4}$ Power = reduces light by two f-stops

This is similar to dimming a light in a room. As the fraction gets smaller so the output power becomes weaker, and this in turn will darken the subject assuming that the distance-to-subject and lens aperture have stayed constant. This is a manual function which is used when taking photographs with the camera in manual mode – the camera and strobes don't operate in 'TTL.'


Another tool often seen when using strobes is a diffuser. Often diffusers are used to soften light and spread light over a larger area, but if you do make use of a diffuser over the strobe then be aware that the light is reduced by one f-stop. A diffuser is a handy tool to have and if used correctly, it can assist in producing some amazing photographs. Most of these functions are performed automatically on modern day digital cameras, so I challenge you to try this with your camera set to manual and I am sure you will, with some practice, achieve amazing results. In the next issue I am going to be talking more about strobes as well as investigating the 'TTL' function which is found on modern day digital cameras. 



Photo Editing



Depth of field

Depth of field is a very important part of a photograph. This can make a photograph dynamic and eye-catching rather than a flat standard image. Depth of field is the area in a photograph that is in focus with the rest of the photograph out of focus. This is especially effective with extreme close-ups with wildlife when the depth of field is clearly defined and small with a blurry background making the image look three dimensional. There are two ways to achieve depth of field; the preferred method is by using the correct settings on the camera when taking the photograph. If you do not manage to do this then Gimp can come to the rescue again!

What to consider when taking the photograph

When taking the photograph the user must change the camera settings to manual to achieve an effective depth of field. Compact cameras have a much bigger depth of field due to their smaller sensors which means that it is more difficult to get the blurred background effect in a photograph. There are settings you can use, however, to improve your depth of field.

1. Set your aperture large (Lower F number, e.g. F2.8)
This will heavily blur the background giving you the desired effect, but if the aperture is set too small (F22) then most of the background will be

in focus.

2. When using a wide angle lens get very close to the subject and focus on the eyes of the subject as the eyes are an important part of a photograph, especially a macro (close-up) photograph.

3. If taking a close-up photograph with a busy background, keep your aperture as low as possible. This will aid with blurring the background and projecting the subject in focus on the photograph.

Editing the depth of field in a photograph

If you have a photograph and it is too busy in the background or you want to create a main, small focal point on the face of the subject, then we will show you how to do this in Gimp. There is a very handy tool in Gimp called the Blur/Sharpen Tool which allows you to 'paint' over areas on your photograph where you need to sharpen or blur. You select, for example 'sharpen' and then move the cursor over the area you want to sharpen, and it is as easy as that. Below is a demonstration of this handy tool.

In the photograph of the turtle I wanted to give more emphasis on the turtle's head. The best way to do this is to decrease the depth of field in the photograph, making the head sharp and the background blurry. This gave the picture much more depth.

How to add depth of field

1. Open your photograph in Gimp.
2. Select in the toolbox the 'teardrop' Blur/Sharpen Tool (Add teardrop.jpg) . When clicking this, the options menu will open below this. Add the image "bstoolbox.jpg" down the left of page
3. There are a few options to select to help you with the blur/sharpen.

- a. Opacity – This sets the opacity of the effect when brushing over the area you want to sharpen/blur. This is like a fine tuner and works well when used in combination with the Rate function (Described below).
- b. Brush – You can select different types of brush ends to work with but the circle tends to be the easiest and most effective to work with.
- c. Scale – This sets the size of the brush head. You will use this a lot when editing as you will need to adjust the size of the brush end to work accurately around your subject.
- d. Brush Dynamics – You do not have to worry about this as this mainly applies to users who will work with a tablet (electronic pen and pad).



If you have one of these then you can use this like a pen and choose the strength of the effect related to the pressure of the pen on the pad.
e. Fade Out – This option causes each stroke to fade out over the specified distance. It is the equivalent to gradually reducing the opacity along the trajectory of the stroke and is good for blending the blur, for example, into a sharper section of the image.

- f. Convolve Type – These are the two options of the Blur/Sharpen Tool. Gimp have made this very user friendly and easy to use. If you select blur, then to switch to sharpen all you need to do is hold down the Ctrl button on the keyboard.
- g. Rate – This is the main tool to use to adjust the strength of the effect when brushing over the area you want to sharpen/blur

To sharpen or blur simply move the paintbrush head over your desired area, holding the left button down on the mouse. Remember, that as you are working from the far blurred background to the sharp foreground you must adjust the rate of the blur so as to blend the two together evenly and realistically.

Sharpening around eyes

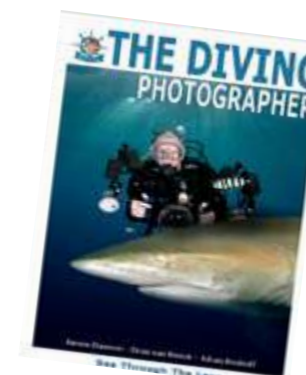
Insert image "using the sharpen.jpg"
Eyes on an image must nearly always be very sharply focussed. To sharpen the eye select the sharpen tool and hold down the left mouse button and work over the eye until the desired sharpness is reached

Blurring the background

Insert Image "using the blur.jpg"
To blur the background, select the blue option, and using the setting explained above, click and hold the left mouse button whilst working around the desired area of the image.



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Aquafresh

The annual visit to the dentist is not one I choose to remember. Lying on a narrow couch with a mouth full of instruments and latexed fingers is not my idea of fun. Inevitably, at some awkward moment when nothing more can fit in my mouth, the dentist will ask a question. Which finger or instrument do I spit out in order to reply?



"Ah huh, your teeth are fine but you need to see the oral hygienist". Is this a money making racket or a polite way of saying – 'I can see what you had for lunch?' Soon more latexed fingers and pipes enter my mouth. High powered jets spray water, and no doubt bits of my lunch, over my face. I try to think of something else. Why haven't fruit flavoured gloves been invented? I remember the delicious fish I ate for lunch. But hey, wait a minute; fish also have oral hygienists – cleaner fish. But unlike me, they seem to enjoy the hygienists' services, even visiting them three or more times a day.

But why would a fish need cleaning, after all they bath in water all day and why would a one inch fish happily swim into the gullet of a 500kg predator? How does a fish know when the clinic is open? Who operates it and what is the fee? Luckily, scientists and ichthyologists can answer these who, what, why, whens and hows of basic fish hygiene.

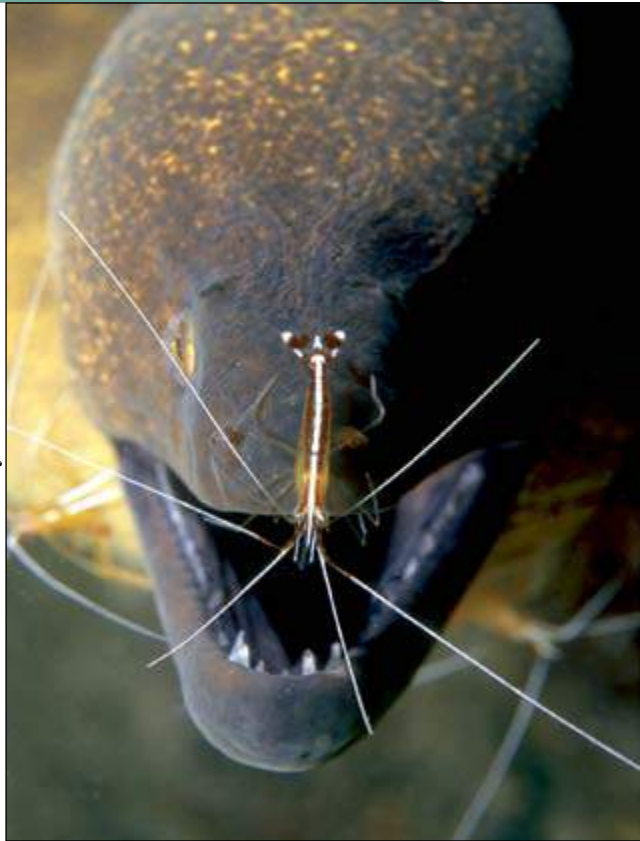
Fish suffer from parasitic infestations, scale rot, dead skin and excessive slime, to name but a few curable ailments. Since fish don't have fingers or nails to pick and scratch and it's not always wise to have a good rub in the sand as the broken shells and rough stones can cause deep cuts and abrasions, they need the assistance of cleaners to stay healthy.

In the aquatic world everyone and everything needs grooming and cleaning - from the smallest to the biggest fish; Moray eels, turtles, Manta rays, whales and even sharks. Sharks don't worry about the dental hygienist – they just replace their teeth. They don't have time to stop for a thorough grooming as they need a constant flow of water over their gills to stay alive, thus their personal hygienists have to travel with them. Remoras and Shark suckerfish latch on with a suck comparable to an Electrolux removing unwelcome guests in the process. Remoras may also travel with turtles, whales and mantas. The majestic Manta rays pride themselves in a full makeover, enjoying both the freelance hitchhikers and also the meticulous preening found at a cleaning station. They too don't physically stop but rather go into neutral gliding near schools of cleaner fish – they have learnt that many fish make light work. The Manta's cousins, the smaller Eagle and Devil rays, hurtle themselves out of the ocean at speed. Their wings smack the surface with force on re-entry with the impact loosening some of the larger pesky parasites. Yet this is way too energetic and risky for most, hence a visit to the cleaner fish is the preferred choice.

A cleaner fish's underwater health care facility is very basic. The premises are usually



By Jeanne Liebetrau and Peter Pinnock



By Jeanne Liebetrau and Peter Pinnock

situated in a sheltered area of a coral reef with no leather couches, glaring headlights and noisy machines. These venues seldom change over the years, even if the original proprietor moves on to the Big Reef in the Sky. The implements used may be simple - pucker lips, sharp incisors and nifty pincers, yet the services offered are extensive. These range from parasite picking to dead skin removal or exfoliation, gill vacuuming, teeth whitening, wound treatment and general grooming. Whether they operate as health clinics, beauty salons or simply cleaning stations, the hours of service are primarily regular office hours i.e. daylight hours.

Only shrimp cleaners do night duty offering nocturnal creatures a spruce before a night on the town. The cleaners never discriminate even though they have their preferences. Big fish, small fish, bad skin, bad breathe or bad teeth - everyone gets the same free service.

Clinics lack the signage to advertise their services. The cleaner fish themselves have to attract their customers. Sometimes they do this by swimming insanely in circles or back and forth as though they have forgotten where they're going and what they're doing. The bizarre behaviour distracts fish who need to be lured close to the sanctity of the reef where both customer and clinician are somewhat protected from predatory attacks.

Fish waiting patiently to be cleaned often adopt strange positions to indicate their need for a service. They may hang motionless in the vicinity of the clinic or adopt a tail stand position. If that doesn't work, they may resort to colour changes, although a wide open mouth with extended jaws is the most obvious clue. Perhaps fish think that the most abnormal stance will attract the beauticians' attention the fastest - it's worth a try. There must always be some fear that a cleaner is going to get eaten and sometimes it does happen by mistake. Whilst the cleaner is working the inside of a gullet, the customer may experience a bit of pain or a tickle, take a gasp and oops - the cleaner is history. But generally customers are so relaxed about being cleaned that they even stop breathing to allow their gills and gill rakers to be inspected and preened.


The demographics of the clinic staff are primarily wrasse, neon gobies and shrimps while species of Butterflyfish, Hogfish and Angelfish are sometimes employed. Some

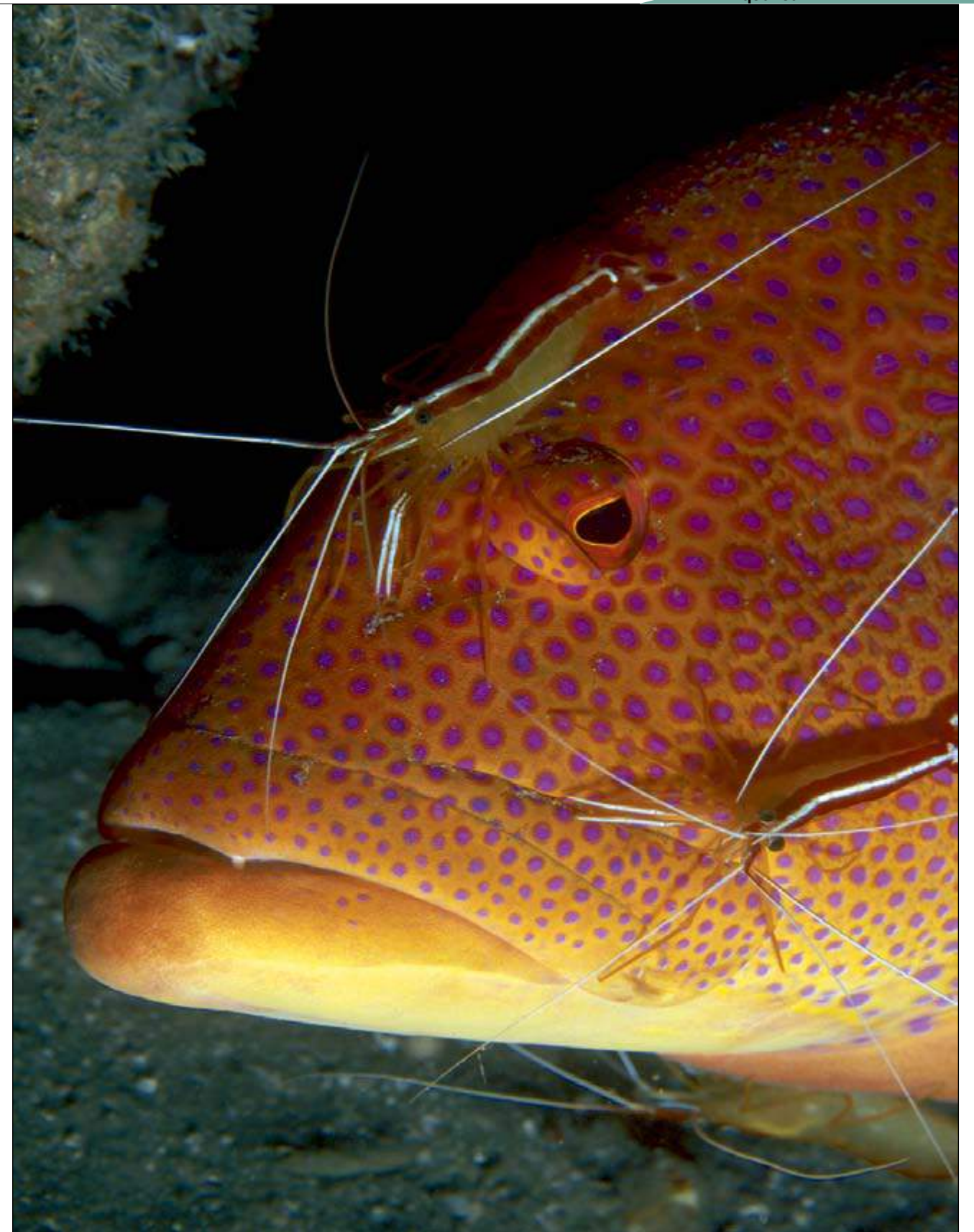
of the staff at these clinics are part-time employees, working as casuals in their junior years. As they reach adulthood their tastes become refined and they seek tastier meals on their menus. Hogfish are an example of this. Most of the wrasse cleaners are full time or obligate cleaners. Then there are the chancers - Mimic blennies. These blighters resemble the hardworking Blue streaked cleaner wrasse, only they have no interest in cleaning, they are out for a quick buck, or in this case, a quick bite. True to their name, Mimic blennies mimic both the colouration and behaviour of the wrasse, luring unsuspecting customers into believing they will receive a manicure but in fact the Mimic blennie bites into healthy flesh.

24-hour clinic

Fish get injured really easily. Maybe they are the ones that got away, or maybe they misjudged the sharpness of reef. Perhaps they were stabbed by urchin's spines sharing the same nook in the reef or the wounds were acquired during battle over women, territory or food? Whatever the cause, wounds fester, especially if left warm and wet. This is when the cleaners become nurses, diligently pecking and removing dead tissue and scales, bacteria, fungi and excess mucus to promote wound healing and speedy recovery. Wounded fish have been noted to spend longer hours at the clinic until granulation of the wounds have taken place and new flesh is in the making.

The importance of cleaner fish on a reef has been debated over the years. In 1961, Conrad Limbaugh did experiments on a reef in the Bahamas. He physically removed all the cleaners from a reef and monitored the outcome. The fish population dwindled, the reef died and he surmised it was because the fish became sick from parasitic infestations. Other scientists have tried to duplicate this experiment but never with the same result. I guess it's a big ocean and there are plenty more fish in the sea. Certainly aquarists will verify the need for cleaner fish to maintain a healthy tank.

The noise of the suction machine abruptly stops, my oral hygienist wipes the spray from my face. "Your teeth are clean, don't forget to floss every day and we will see you in 12 months time". Huh! It's so much easier for a fish. 



You can make a difference.

Be informed. Choose your seafood wisely.

Consider its sustainability and always go for green where you can.

Refer to the full guide for more information.

Things to do...

Whether you are at a supermarket, fish merchant, dining out at a restaurant or simply getting takeaway, always ask...

- **Is the species overfished?**
- **How was it caught or farmed?**
- **Is it a deep-sea, slow-growing or long-lived species?**

Tell your friends! Spread the word about how good it feels to eat sustainably.

Consult the website and get your hands on the full version of **Australia's Sustainable Seafood Guide** or you can download the **free Android** or **iPhone app** for more information on each species.

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Why do your choices matter?

The fish we choose directly affects the health of our oceans.

Worldwide demand for seafood is increasing, yet many populations of the fish we enjoy are overfished.

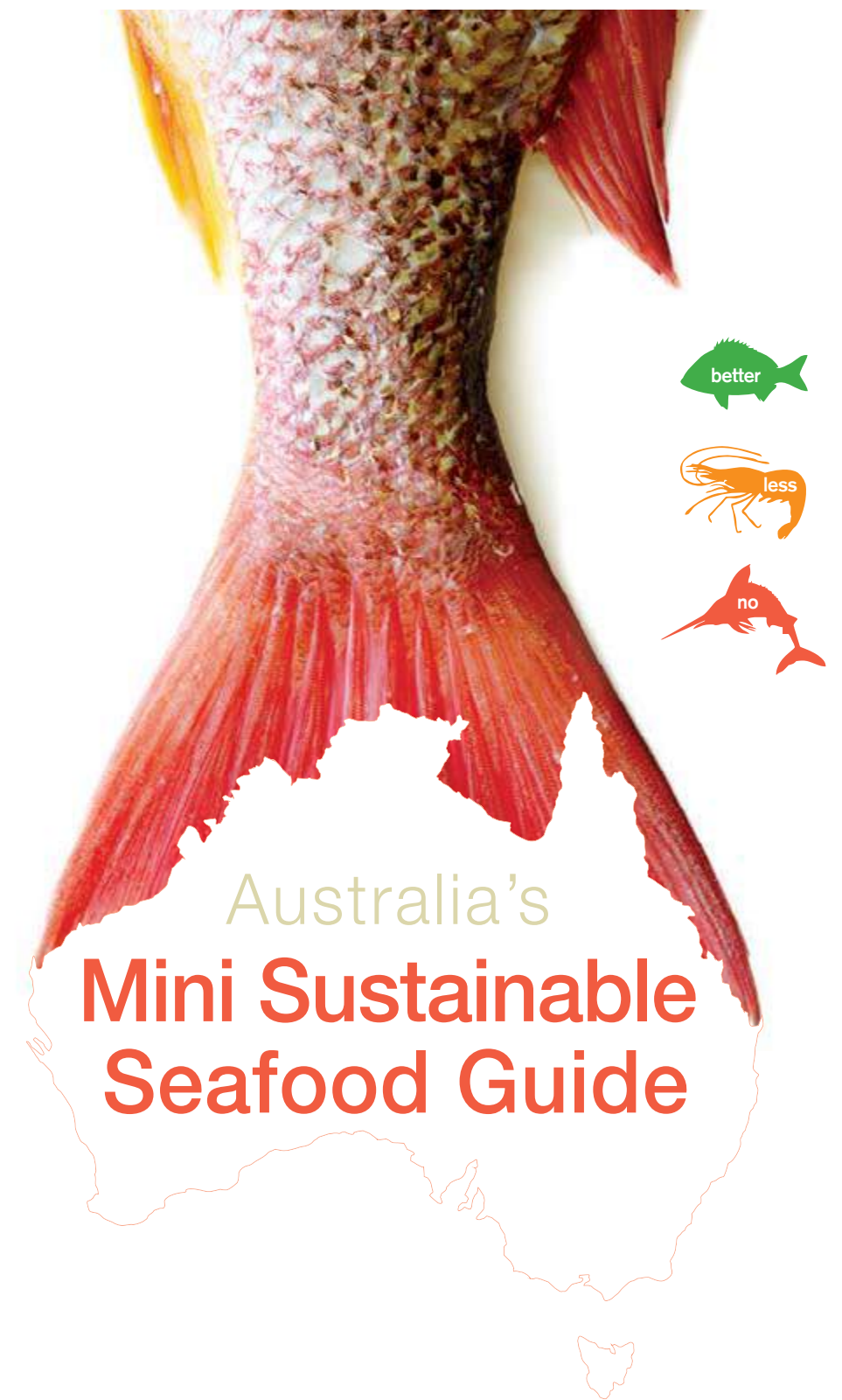
Overfishing, destructive fishing gear and poor aquaculture practices impact significantly on our seas. Once considered inexhaustible, our oceans are now in a state of global crisis and they need our help.

Be part of the solution.

Become a Sea Guardian today!



www.marineconservation.org.au



Australia's Mini Sustainable Seafood Guide

Your guide
to choosing
seafood wisely



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Better Choice



These species represent a **BETTER CHOICE**. Species in this group are not currently overfished. They are generally resilient to fishing pressure, have a history of stable catches and are caught or farmed using techniques that have low environmental impacts. Some of these species may still have minor conservation concerns, but have been assessed to be a better seafood choice.

Australian Wild Caught Fish

	Marketed as/species considered
Australian Salmon	Australian Salmon
Crabs	Mud Crabs, Spanner Crabs
Goldband Snapper	
(WA & NT)	Tropical Snapper
Flathead (NSW & VIC)	Dusky Flathead
Bay Prawns	Prawns
Southern Calamari	Calamari
Whiting	King George & Stout Whiting

Australian Farmed

	Marketed as/species considered
Barramundi	Barra
Blue Mussel	Mussel
Prawns	Black Tiger, Kuruma & Banana Prawns
Oysters	Sydney Rock, Native & Pacific Oysters

Eat Less



EAT LESS of these species. Wild caught species in this group may be caught using fishing methods that cause some damage to marine habitats or are associated with significant levels of bycatch. There may be scientific uncertainty about the status of wild caught stocks and careful management will be needed to protect stock health. If farmed, the aquaculture methods used have some environmental impacts on our seas.

Australian Wild Caught Fish

	Marketed as/species considered
Barramundi (WA & NT)	Barra
Blue-eye Trevalla	Blue-Eye Cod
Bugs	Balmain & Moreton Bay Bugs
Flathead	Tiger Flathead
Mahi Mahi	Dolphinfish
Prawns	Western & Eastern King, Banana, Tiger, School & Endeavour Prawns
Tuna	Albacore & Yellowfin Tuna

	Marketed as/species considered
Australian Farmed	
Atlantic Salmon	Tasmanian/Smoked Salmon
Rainbow Trout	Ocean Trout

	Marketed as/species considered
Imported	
Basa	Freshwater fillet, Royal Basa & Mekong Catfish
Nile perch	Lake Victoria Perch

Say No



SAY NO to these species. Wild caught species in this group, whether Australian or imported, may be overfished or their capture heavily impacts our seas, eg: killing threatened or protected species as bycatch or damaging sensitive habitats. Farmed species include those produced by methods that place significant stress on our oceans.

Australian Wild Caught Fish

	Marketed as/species considered
Blue Warehou	Sea Bream
Gemfish	Hake
Mulloway	Jewfish
Orange Roughy	Deep Sea Perch
Shark	Flake
Snapper	Pink Snapper, Tropical Snapper

Australian Farmed

	Marketed as/species considered
Yellowtail Kingfish	Kingfish, Yellowtail & Tasmanian Yellowtail

Imported

	Marketed as/species considered
Farmed Prawns	Pacific White, Whiteleg & Black Tiger Prawn
Blue Grenadier	Hoki
Hake	Cod
Tuna	Albacore, Yellowfin, Bigeye Tuna

Note: Canned tuna sustainability is brand-dependent. Check our website, or smartphone apps for details.

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Disable Divers & Senior Divers over
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Is that a bug in my sea?

Have you noticed when you scuba how clean the sea bed is? Where are the skeletons of dead fish, whales, sharks, seals, crabs or rotting sea weed? Ever thought why the sea always smells fresh and clean?

These questions are made even more startling if we consider that all the rivers of the world dump their rubbish, both natural and man-made, into the ocean and the ocean amazingly seems to clean up the mess. Think what a suburb looks like when waste removal does not take place for a few days and the smell generated by the decaying dirt. How does the ocean do it? You need to think of the oceans as the heart, blood, kidney, liver and, in part, lungs of our planet. The currents (heart) pump vast quantities of sea water (blood) from the equators to the poles and from the poles back towards the equators. This pumping dilutes and distributes the pollutants and brings nutrients from the poles to the warmer waters.

2010 saw a census of marine life published. It showed that we know substantially less about life in the sea than we thought. For example, in the 1950s we believed there were about 100 000 microbes per litre of sea water – the 2010 census shows that the number is greater than a billion.

These bugs act as the kidneys, liver and lungs by converting the mess into useable molecules or precipitating them to the ocean floor, and in so doing, cleaning and purifying the ocean water. In other words, the micro-organisms

clean up by creating an unseen food web, not only for themselves, but for all life that inhabits the oceans. Not all microbes help with the cleaning, but their presence is critical to keeping the web sustainable.

The microbes found in this web stretch from the smallest viruses all the way up to complex animals such as the copepods, from so small that you need an electronic microscope, to just a good pair of glasses.

They can be grouped into three distinct categories; 'The Decomposers', 'The Producers' and 'The Consumers' **. Many micro-organisms have dual functions.

The total weight of the microbes in the ocean is estimated as equivalent to 280 billion elephants. That is 40 elephants for every human. Let us look at some of the bugs in more detail.

'The Decomposers' Viruses*

Yes, viruses, the simplest of life forms. We only think of them as items of disease, but those are just a few of the countless thousands types that exist. Their complex relationship in the

food chain is little understood. But of the three categories, they best fit in as a 'Decomposer' because they remove the sick, the weak and the old of the oceans micro-organisms, making this huge mass available to the bacteria and archaea for conversion. We also know that they are critical to life on earth because they help the microbes cope with environmental changes by causing changes to the micro-organism's genes.

Bacteria*

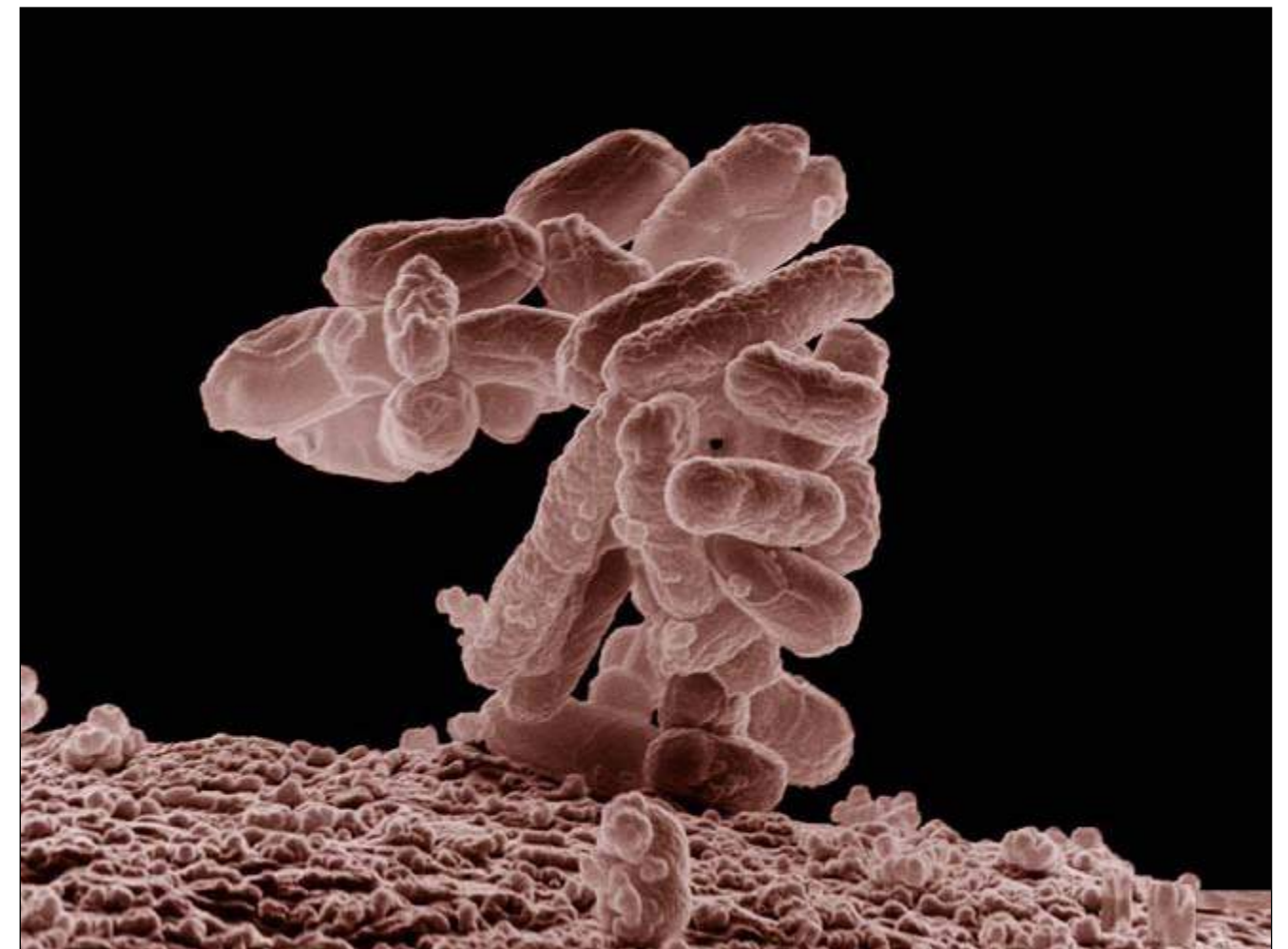
Again we think of them as bearing disease but in actual fact ocean bacteria take a big responsibility for the well being of our planet. They are the only creature that can convert atmospheric nitrogen to useable nitrogen molecules. They also help other marine creatures process carbon into sugars and oxygen and convert essential minerals into useable molecules. But perhaps most important they break down dead organisms, converting bones, flesh, excrement back to useable molecules.

Archaea*

Before 1994 this groups of single cell animals were thought of as 'freaky bacteria' because they were found in boiling geysers, the freezing water at the bottom of ocean trenches, or in acid ponds. DNA analyses showed that these creatures were a completely different life form and are now recognised as such. They carry out similar functions as bacteria but in extreme environments. There is growing evidence that archaea may be the second most abundant life form on earth.

'The Producers' Phytoplankton*

For the sea to remain healthy and clean, carbon dioxide (CO₂, green-house gas) needs to be removed and oxygen introduced. Phytoplankton, which is mainly made up of ocean algae and some type of bacteria, perform this function, acting as the lungs of the ocean. They not only remove the CO₂ from the sea using sunlight, but produce oxygen and sugar molecules as



by products. It is thought that more than 50% of the earth's oxygen is produced by the phytoplankton and the sugars feed the ocean's animals.

There is another 'Producer' we should mention, the zooxanthellae. This specialty algae is associated with coral reefs. It supplies the coral polyps with sugar and oxygen to build and repair the reef. The symbiotic relationship creates an ecosystem, the coral reefs, in areas that would otherwise be sea deserts.

The 'Consumers'

The final step in keeping the sea clean is to link the web. The 'Consumer' microbes complete the circle by eating the 'Decomposers' and 'Producers' and making the energy and food from these bugs available for the bigger animals.


As a diver up the West Coast we bump into a 'Consumer' that clouds the water – Red Tide.

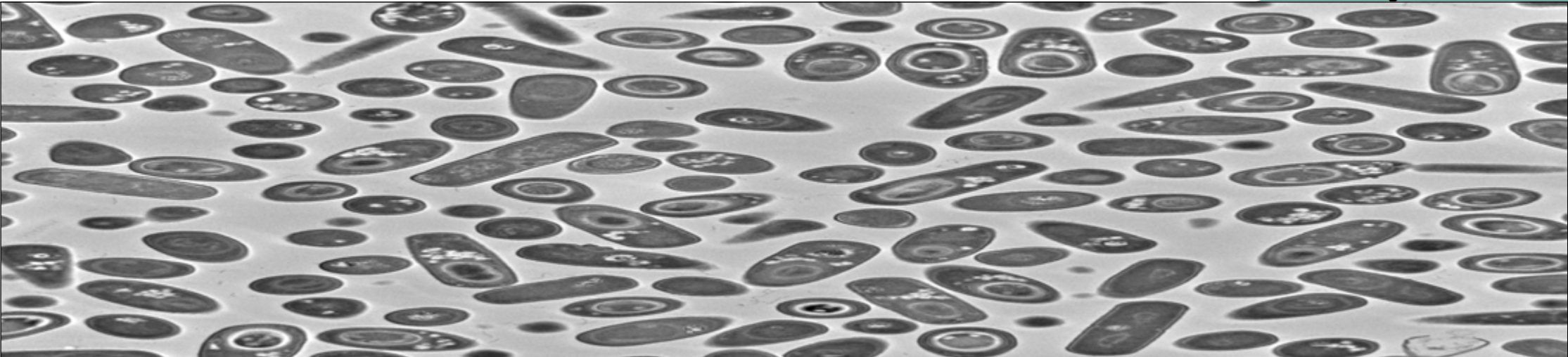
Red Tide is the name given to the swimming algae, Dinoflagellates*. It cleans up the water by eating bacteria and bug 'poo'. In turn it becomes food for the filter feeders, mussels, perlemoen, oysters, etc. Only a few species of Dinoflagellates are poisonous while the majority are safe.

Two 'Consumers' we hear about but only a lucky few of us have seen are, Krill* (Norwegian for Whale Food) and Copepods*. These shrimp-like animals eat the phytoplankton, and in turn, become food for whales, squid, seals, dolphins, fish, etc. Without their intervention the sea would look like a green pond. They live in a vertical column of water descending to around 200m during the day and ascending at night to feast on the phytoplankton.

Evidence shows that it was microbes that converted the hostile poisonous earth that was created a few billion years ago into the 'beautiful planet'. They may also be the salvation of the planet from global warming.

*The names used are common to general conversation and should not be interpreted as an attempt of classification.

** The categories, 'Decomposers', 'Producers' and 'Consumers' are from the NASA Biglow Laboratory publication on Food Webs. 





OZ DIVER



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Becoming a cave diver

To be a fully qualified cave diver you need to be able to:

- * Remain cool and calm under all circumstances.
- * Be comfortable in an environment where you can't get directly to the surface. (You may need to combine this with the virtual ceiling of decompression as well).
- * Dive in low light, no light or zero visibility situations, with or without a buddy, with or without a mask. Lose a line (the way home) and find that line again, either with or without lights.
- * Find your way around a cave with multiple entrance and exit routes without getting lost and managing your gas supply to complete the dive.
- * Lay line efficiently and correctly so that you or others can follow it in the dark. Reel line in without it slowing an exit.
- * Operate in a team and communicate as a group where you may not be able to see most of that dive team.
- * Swim using a variety of techniques so that you do not silt the environment, even in tight spaces. Get yourself and a buddy through restrictions while sharing gas.
- * Manage complete buoyancy failure.

There are a few routes to full cave diver. All start on the land – practicing with reels laying lines

and covering various scenarios. Twin tanks are the mark of a cave diver; this will enable deep cave penetration, however, you do not have to start with twins, you can start with Cavern diver.

This is diving in the light zone, but still with a physical overhead. Here you use a single cylinder (H valve recommended) with a minimum of one 2nd stage hose being 1,5 to 2m long. You need two lights and cave and safety reels. You only require 10 dives and should be an Advanced diver.



By Don Shirley

The next level is Intro Cave. Here you go beyond the light zone. You can still use a single cylinder, and must have a dual outlet (H-valve), and one 2nd stage hose of 1,5 to 2m. Penetration in the cave is to a third of your cylinder volume. A twin cylinder could be used but must only be used to a sixth of its volume. Three lights are required – one primary and two secondary, and all the appropriate reels. To begin this training you need at least 25 dives, and must be an Advanced and Cavern diver.

Cave diver allows full penetration and you will use twin cylinders along with the same equipment for intro cave. You need to be an intro cave diver, and have 50 dives to get this far. If you have already done intro cave you need 400 minutes of cave time over a minimum of eight penetrations, otherwise you would do 480 minutes with a minimum of 12 penetrations.

This will prepare you to handle all requirements a cave can throw at you. Cave training can be carried out with a rebreather as well, providing that enough OC bailout is carried.

What should you do first: Cave or Deep diving?

A lot depends on the sites that are available. If you only have deep caves in your area, you must learn to be a deep diver first. Neither is a requirement for each other, but I personally feel that it is better to start in a shallow cave and build up experience first before going into deeper caves.

Both cave and deep divers need to be cool and calculated about what they do, and they have similar equipment requirements and similar skill levels. The thing that separates the two is the environment. A deep diver in the ocean deals with open space. Their skills manage this space: controlling buoy lines, surface support, support divers and the like. Will they be able to get back to the boat if they become separated from the team? If they have long decompression obligations, where will the currents take them? Should they carry all their gas or risk trying to find their staged cylinders?

A cave diver generally always comes back the way that he goes in. He may have to manage strong flows in the cave, but will be able to leave cylinders for his return, which will still be there when he comes back. If he does not come back, the cylinders are no longer required; it's as simple as that. In terms of space, and depending on the cave environment, generally the cave divers have a much more limited space to operate in. The cave diver must swim using a different stroke to the open water diver. Cave divers and deep divers are similar animals, but also a totally different breed.

A warning

A diver that who not cave qualified and enters a cave is still not a cave diver. You cannot adapt open water techniques and use standard recreational gear in a cave. It does not matter what level of diver you are – open water or instructor – caves take great pleasure in collecting bodies.



Q & A

Have you had any close calls whilst diving?


Nuno Gomes



The first close call was at the bottom of Boesmansgat, at 282,60m. I was stuck in very thick mud on the bottom in the deepest part of Boesmansgat (I estimate the thickness of the mud and silt to have been at least 1,5m thick). I tried to swim up but could not and my efforts made me dizzy. My legs were

buried in the mud and on top of that, I had no visibility. I inflated one of my wings fully hoping to become buoyant but I was still stuck. I then decided to also inflate the other back up wing. Eventually I came loose and started ascending really quickly... time to dump some gas from the wings to slow down my ascent. I made it off the bottom, and twelve hours later after doing my deco, I surfaced. The lesson learnt; never do any technical diving without a back up wing!


My second close call was at 271m in the Red Sea. My new regulator stopped working at that

depth without much warning. I grabbed my back up regulator and it worked (it was a much older model). I aborted the dive and started my ascent. The gas in my back up set was not enough to get to my first stage cylinder at 170m. I had to hold my breath while ascending and venting my lung for the last 20m to the first stage cylinder at 170m. I made it to the surface nearly eleven hours later. The lesson learnt; newer equipment is not necessarily better. Test it first and have a back up regulator which has been tested before. 

Barry Coleman



Whilst preparing my rebreather for a deep dive, I was distracted half way through the assembly stage. On returning I continued with the assembly, although afterwards I distinctly remembered thinking that something was missing. To top everything off, the vehicle taking all the equipment down to the beach was leaving,

which did not allow for my usual pre-breath to check that all was okay. Once out at sea and over the dive site, the usual kitting up was hastened by the large swell – no one wanted to linger longer than necessary. I rushed with kitting up and missed the buddy check, again something was telling me there was a problem, but I kept on with the whole process. With the mouthpiece in my mouth and a quick backward roll I swam for the bottom. At 6m I could hardly breathe – I switched to open circuit immediately and decided to abort my dive there and then. My subconscious was screaming at me and I had a loop problem! On returning to the surface on open circuit and after disassembling I found that I had no absorbent! The lesson I learnt was to never interrupt the equipment assembly and never dive a CCR without the pre-breath check. I was let off very lightly and it may very well have not been the case. 

Pieter Smith




Let me use quite a recent case. It was in March 2008 when we were searching for Coelacanths again. I have been part of all the Coelacanth expeditions and have done many canyon dives (100-115m range). I believe that I am an old hand in trimix diving, but that does not necessarily exclude you from potential mishaps.

Preparation was thorough and well planned. We found five Coelacanths at a depth of 105m. At the end of our bottom time, I deployed as usual, using the deployment bag I have used on many other dives and for almost 11 years. I also carried a camera that I borrowed from one of our support divers just before the dive that was hand held.

Murphy also dived with me that day and between the two of us, 'we' just couldn't deploy – the bag just wouldn't take in any air. Peter Timm also tried, but couldn't. Time was running out and the currents were quite strong. Peter handed me his second reel and I deployed that. As the bag sped for the surface, I got entangled in the line which pulled me up uncontrolled. In an effort to free myself, I had to drop the camera to free my hand and could just hold on to the reel. Then the next problem arrived. The reel line had a knot in it (which I didn't know), and that too got stuck, pulling me further up again. I managed to stay calm and eventually could normalise the situation.

What did I learn?


1. Check and re-check your equipment – even if you think you know it well.
2. Never dive with something new when doing a serious dive.
3. Ensure that you have redundancy. (I left my second reel on the boat).
4. No hand held items – rather fasten them with clips to your harness.
5. You are never too old to learn.
6. Mishaps or problems come in numbers – realise that. 

Pieter Venter



Which one? Well, one of the close calls which was not entirely of my own doing, and therefore not that embarrassing, happened at Diepgat in Sodwana on the Coelacanth Expedition in 2001. On one of the build-up dives, a first deep trimix dive with full kit, back up teams and the full intended dive plan for the 100m

plus dives etc., the visibility was very bad, about 3m at a depth of 80m. I was also carrying a video camera. We crashed into the bottom before we could react, the dive was stressful and I lost and found my buddy, Peter Timm, a few times groping around on the bottom in the darkness. It was hard to stay together, but luckily the visibility improved a little on our ascent and we managed to stay together.

Our safety divers arrived as planned and a free floating deco 40m line was deployed. The line was heavily weighted and two back up cylinders were attached to the line. Still not entirely comfortable, I was grateful for the security of the deco line and I handed my ascent buoy to Pieter Smith, who was, as luck would have it, my safety diver for that dive. Clutching the line I did not realise that the line loosened from the buoy. Thinking back it was strange that it was getting dark around me and there was a slight increase of pressure on my ears. Pieter raced after me, dragged me away from the coiling line and cylinders coming from above and assisted me back up from the abyss. What did I learn? The importance of a good safety diver on technical deep dives and the importance of incremental build up dives. Also, the dive should have been aborted when we entered into the complete darkness beyond 70m, for which I was not mentally prepared, coupled with a heavy camera and stress. It was the start of the fall of dominoes which could have ended badly. Stop after the first domino falls – do not push on. 

NITROX IT'S A GAS



© 2014 Institution of Invisible Gas Photographers

PICTURE OF NITROX IN ACTION, TAKEN WITH WIDE ANGLE LENS

START YOUR COURSE ONLINE TODAY!

There was a time when the use of NITROX was viewed as extreme by many in the recreational dive world. Now it is fast becoming the gas of choice for mainstream diving and is available for all divers. Like so many changes to the industry it is driven by the top echelon of the technical diving community. That's one of the things that makes RAID different, the owners are real divers and in fact two of the directors are considered among the best technical divers in the world (see their profiles below). That means RAID training programs are at the cutting edge and in a class all of their own.

So what is NITROX and how does it work? It is essentially oxygen enriched air, it has many benefits over the use of traditional air, including potentially longer bottom times, less risk of decompression sickness and many people report increased energy levels. That's why all RAID dive centres actively promote the use of NITROX.



Paul Toomer

Paul is a force of nature in the diving world and his unique approach to training is legendary. Paul has reached the pinnacle of the world's leading diver training agencies writing the technical programs for a major training agency before becoming a partner in RAID. He is a sort after speaker at technical events and dive shows around the world and an expert in all facets of technical and rebreather diving. Paul is the International Training Director for RAID.



Barry Coleman

Barry is a pioneer in technical diving. Barry conceptualised the design of the world's first recreational rebreather and working closely with the design team at Poseidon, the Mk VI Discovery Rebreather was born. To support the diver training required for Mk VI, Barry wrote the initial training program which ultimately became RAID dive training, clearly demonstrating the power of adapting traditional technical products and training to the recreational market.

www.diveRAID.com



Just like RAID there are loads of benefits to NITROX, the more you use it the more you'll see it.

An Introduction to Diving with NITROX

Want to Dive on NITROX? - This may be a familiar question

So what exactly is **NITROX** and how may it be of benefit to me diving?

Contrary to what many people believe, NITROX is not a deep-diving gas mixture.

In the SCUBA diving community NITROX refers to any SCUBA diving gas mixture composed of nitrogen less than 78% and oxygen greater than 22% and less than 40%. The trace gases are ignored. As you can see from the picture above, NITROX is a colourless and odourless gas and is available for all divers.

NITROX will extend your allowable no decompression limits or bottom time. It does this simply by reducing the amount of Nitrogen gas you are exposed to under pressure.

These benefits do of course have conditions associated with them and like everything can be abused. You will learn about these conditions and how to safely dive whilst breathing NITROX in RAID's NITROX course.

NITROX is known by many names: Enriched Air NITROX, Oxygen Enriched Air, NITROX, EANx or Safe Air.

If you see "NITROX32" or "NITROX36", the number is referring to the percentage of oxygen content in the gas mixture and in turn the diving cylinder you are using.

So "NITROX32" or "EANx32" or "Oxygen Enriched Air 32" contains 68% nitrogen and 32% oxygen. "EANx36" contains 64% nitrogen and 36% oxygen etc...

The two most popular blends are EANx32 and EANx36, developed by NOAA for scientific diving, and also named NITROX I and NITROX II, respectively.

It is very important that you check the gas mixture in your cylinder before each dive, because you need to know what mixture you have for calculating your dive times and to find out the maximum depth you can dive. You will learn how to do this in your RAID NITROX course.

Oxygen is toxic at depth for us humans! Yes the increased pressure at depth will increase the partial pressure of oxygen (PpO2) and this increased pressure can become toxic. With NITROX diving we have to stay within two limits, the NDL limit which as a diver you already know about and the other is the oxygen toxicity limits. Staying within these

two limits will allow you to dive underwater longer than an equivalent AIR diver at the same depth and more often than an AIR diver to the same depths.

It is all about balance!

When you complete your NITROX course you find how NITROX will be of benefit to you. You will use it as a means to help you diving, not as a macho status!

For example if you are planning 3 or 4 dives a day whilst on holiday then use NITROX, because of the benefits, but if you are doing one dive in the day to a shallow depth, there is little need for NITROX. This is a generalisation, and there are always reasons for and against. The important issue is to understand it and plan for using NITROX if it will be of benefit which you will learn more about on your course.

History

NITROX gas mixture is nothing new and has been in use under differing names since before the Second World War.

The history and development is well known and risks associated with well documented. NOAA is perhaps the best known authority and has developed tables and working parameters that are still in use and followed today.

Myths



- NITROX does not remove the risk of decompression sickness.
- NITROX does not remove the risk of pressure related injuries.
- NITROX does not reduce Nitrogen Narcosis

The RAID NITROX Diver course is designed to introduce you to the procedures and skills to safely dive NITROX. There are many benefits of diving NITROX and the course will give you a good grounding in the use of gas mixtures other than pure air.

This course is also a grounding set of theory and skills that will help you through the rest of your RAID journey. All other levels above the RAID Open Water and NITROX courses have gas analysing and calculations embedded. This means the information and skills you learn in your RAID NITROX course are valuable through all your RAID training programs.

Sign up for RAID's NITROX course today in just 3 easy steps.



STEP 1 head to www.diveRAID.com and click the button REGISTER at the top right. Then complete the form and wait for an email from RAID. STEP 2 on receipt of your registration confirmation email, open and follow the instructions. Step 3 complete the forms. You are now registered! Once you have completed your online training successfully you will have a great understanding of diving with Nitrox. Your RAID Dive Centre can then complete your training and issue your certification, this may include diving on Nitrox. For more information contact RAID at admin@diveRAID.com or call 02 4088 0560.



Instructor Diaries

Become an advanced diver


After you have qualified as an open water diver the next step is to press forward and become an advanced diver.

Now different institutions have different criteria on how to become an advanced scuba diver, but in the end it all boils down to learning different specialties. These specialties can vary between a few topics but usually a limited visibility dive, deep dive, navigation dive and a search and recovery dive form the basis of an advanced course. I do apologise to other institutions who do it differently, but these core dives I believe must form part of an advanced course. In addition to the above four mentioned dives, two additional dives are added to conclude the practical part of the advanced course. The additional dives can be selected by the instructor from a standard list provided by the diving institution.

Now don't be fooled, the advanced scuba diver course is quite different from the open water course and it is a lot of fun! The dives are structured in such a way that on each dive the student will learn not only new skills and gain knowledge, but it will also open up the underwater world a bit wider for them.

Of course the deep dive is always a talking point and some people find this quite daunting, which is natural, yet after the dive has been completed, the self-confidence and belief starts. Then of course my absolute favourite dive of all the advanced dives is the limited visibility dive which I prefer doing as a night

dive. The unspoken excitement and tranquillity that sets in as the group descends to the grid with flashlights and strobes lighting up the water makes this an unforgettable dive. Numerous students have been nervous before the dive but when they get out of the water in darkness the excitement and thrill of the dive is incredible (which is essentially what diving is about – that feeling of achievement and bliss). Navigation and search and recovery are both great dives to complete and will teach the divers how to direct themselves or locate a particular item. These skills are very handy, especially in the ocean when the diver needs to orientate themselves on the reef, and no I am not only referring to working a compass. So why move on to becoming an advanced diver? The answer is simple – you will get more out of your dives, you will be able to dive on deeper reefs up to 40m and can enjoy spectacular night dives! The advanced scuba diver is a high-level, complete scuba diver. After the advanced diver course, diving branches out into a variety of specialties which will contribute greatly to a particular skill but not address a variety like the advanced course does. Stop wondering if you should do an advanced course, get going and enjoy the full moon from 10m below!

Happy and safe diving! 



What you need to know about dry suits

Hydration is a big thing in diving – you always hear about drinking lots of water, and you will always see me topping up before and even during the dive. This causes certain issues though...

There are two types of divers – those that have urinated in their wetsuit and those that will one day. It's a fact that if you are hydrated correctly, you should need a pee when entering the water. All very well in a wetsuit, but what if you wear a dry suit? This can be a messy and smelly affair. If you spend a long time in a suit on the surface, a convenience zip (a small version of the entry zip) strategically placed, works well – just make sure that you don't fall overboard while using it. Another and more popular way around this predicament is to use P-Valves. These are available for men (condom or catheter) or women (she-p). For men it is an easy fit as a sheath is used with self adhesive glue, and the bottom is inserted into a tube. The tube allows the diver to have an 'off board exhaust' which keeps the suit dry. The same system is available for women, but the sheath has to be glued into place. Both systems work well, until removal, when it's guaranteed to make your eyes water when you pull it off. The male sheaths are disposed of after use, and the female ones are washed and reused. In both cases, the tubing should be washed after dives. Adult nappies can be used if you don't have or want off-board dumps. Always wash the suit if there is any spillage.

To get the best life out of your suit, there are a

number of things that you should do to keep it in good order:

Latex wrist and neck seals must be cut to the user's size with a pair of very sharp scissors. Seals should lay flat on the skin surface when donned. Always use purified talc on the seals – never use baby powder or other perfumed powder – it will eat through the latex (this is due to our temperatures). You can order the purified talc through your chemist. In our hot weather it is always a good idea to talc the seals just before you put the suit on. This makes for easy donning without stretching the seals beyond their limits. Also talc after use and when in storage. It boils down to using talc all the time really!

If you are donning in wet conditions, you can use soapy water to ease the seals on. Some water-based lubricant that will not react with the rubber (KY jelly for example) can also be used. Watch out for fingernails or rings as they will easily tear a seal. Carry a bike repair kit as you can always patch a small tear, thus preventing an aborted dive weekend. The patch won't last long, so the seals will need to be replaced soon afterwards. Other specialised glues, such as Aquasure, can also be used.

Next to the seals, the zipper is the next defence



By Don Shirley

against water ingress. They are clever devices – once closed they are quite rigid and will not let water in. The first line of care is to lubricate the outer part of the zip with either bees wax or the manufacturer-supplied zip lube. Do this every four to five dives. Wipe off the excess so that it does not collect sand or grit. If you are in sandy/muddy conditions make sure the teeth of the zip are clean.

If you have a back entry zipper, get someone to close and open it for you. Make sure that they know not to catch the under suit. Put your arms in 'coat hanger' stance to keep tension. If resistance is felt, don't pull through it – back up 15cm and try again. Tip: When closing the zip, keep one finger under the zipper as this will keep the undergarment away from the zip.

Yes, you can use some fancy techniques to open or close it yourself, but one day you might damage the zip. Life is a lot easier with a front entry zip as you can self-do. The suit inflator connector, shoulder and wrist dump should be rinsed in fresh water after each dive. They should be serviced annually or when leaking. To store the suit, make sure that it is fully dry. Talc all seals, leave the zipper open, (it allows the membrane to be 'at ease'), and lubricate the zip. Be careful when folding/rolling the suit as you don't want to put any stress on

the zip. Don't store in extreme cold or heat. Don't forget your thinsulate – these are generally made of pretty high-tech materials and require special washing to maintain their insulation quality. Follow your manufacturer's guide lines. A very light soap powder such as 'Charlie's Soap' works well.

Like all good gear, including your body, drysuits need looking after. They will last a long time if you take care of them, but they are unforgiving if you don't!





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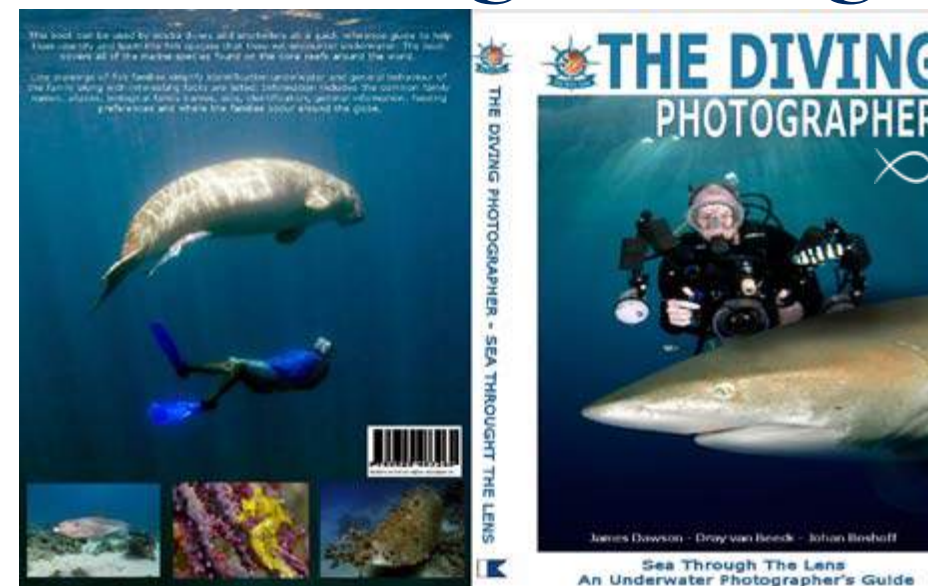
The Dive Spots of Western Australia is an indispensable guide for all levels of divers and snorkelers, broadening their horizons on places to visit and dive/snorkel in Western Australia. The book has more than 175 dive spots in Western Australia. Important guidelines on each coastal dive destination include accommodation, facilities, travelling tips and dive conditions. Complete with photographs and more than 100 illustrated maps of each dive site, all reefs are star rated to cover depths, marine life and other essential information for the diving and snorkelling community.

For more information visit www.thedivespot.com.au



Johan Boshoff
DIVE & SNORKEL GUIDE – EXMOUTH TO ESPERANCE

The Diving Photographer –



As scuba divers, we are not always the best photographers, but we do learn very quickly. And if we have a handy guide book, the time spent with our cameras underwater will increase rapidly.

This easy-to-use guide book for the diving photographer can be used by all levels of photographers. It helps you with choosing the right type of camera for your ability – although with all the information presented you will learn so quickly that you will have to buy a better camera after working through

the book! Preparing and setting up your equipment becomes a breeze with easy pointers on how to check and replace o-rings, quick tips on keeping your housing dry and other small things we usually forget to check.

The technical advice on how to perform manual camera settings, lighting techniques and editing the not-so-perfect shot was a great help. One of the main things I took from this book was learning to back up my photographs and then trying anything and everything with them in the photo editing programmes until it looks like the professionally taken shot that you have been aiming for the whole time. Some other topics covered are strobe positioning, ambient light, photographing wrecks, long exposures and equipment maintenance.

I must say that this book has proved to be a great help in improving my photographing and editing techniques. Watch out Sodwana Shootout, here I come!

The Diving Photographer is available in all good scuba diving and book shops or online at www.thedivespot.com.au. Cost: \$20

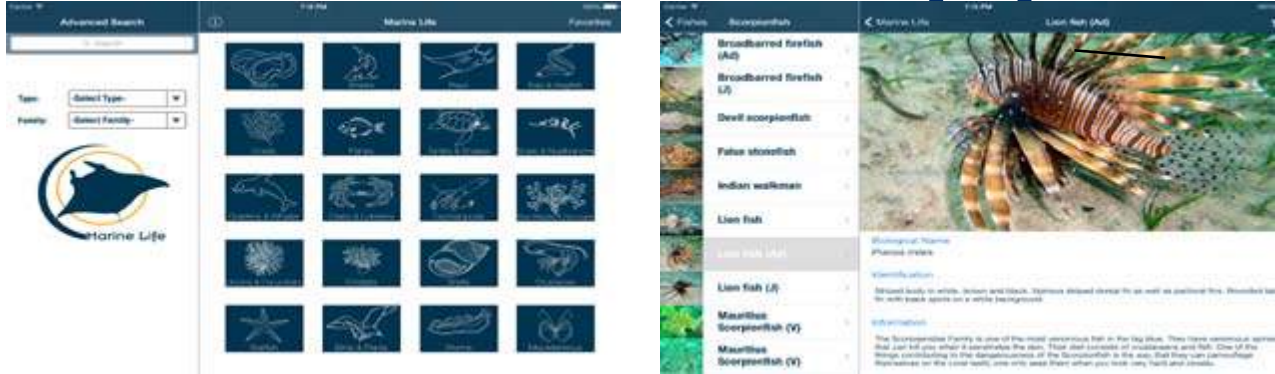


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Marine Life app

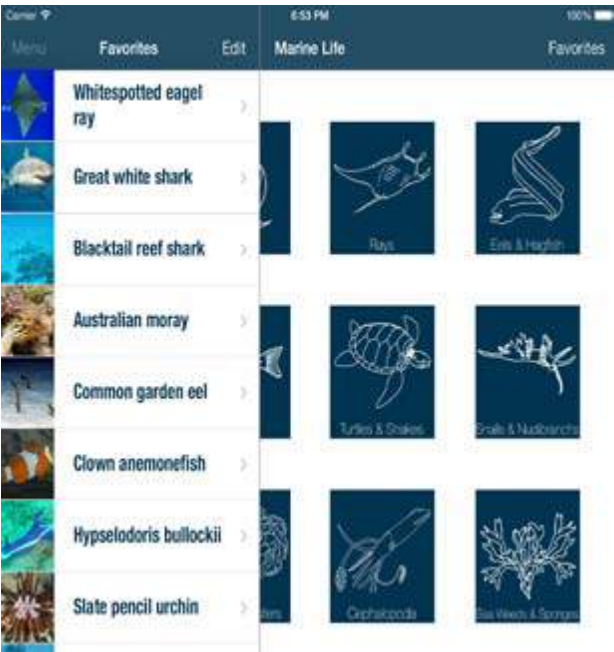


A user friendly app designed to assist divers with marine life identification and at the same time learn more about the fascinating lives of our ocean dwellers.

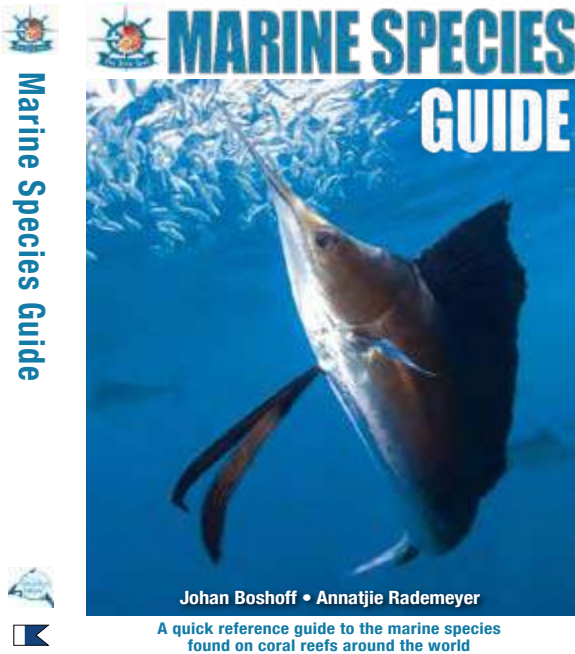
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A leader in marine life identification and used in education programs all over the world, now available to you from Apple App Store for only \$6.

<http://AppStore.com/marinelifemarinespeciesguide>



Marine Species Guide –



Yes, it happened...I had to buy a larger bookshelf. The latest book from The Dive Spot has landed on our shores – The Marine Species Guide.

A book for both scuba divers and snorkelers to identify and learn all about the different fish species they will come across under water. The book covers most of the marine species found within coral reefs around the world. Line drawings of fish families simplifies identification underwater, while general behaviour of the family along with other interesting facts are listed.

Information include common family names, aliases, biological family names, size, identification, general information, feeding preferences and where the families occur around the globe. Photographs of the most common of the species found when scuba diving or snorkeling are included and the fish families are organised for easy reference.

The book works very well in accompaniment with the Marine Species Slate, which can be taken underwater to help with fish identification.

To buy your copy for \$ 22, visit www.thedivespot.com.au or email info@thedivespot.com.au




It's not the destination – It's the Journey!

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Do you know your buddy?

Does your buddy hate you if:

- a. He gives you the 'wait here' sign and you are still on the boat?
- b. He 'forgets' to close your dry suit zipper?
- c. When you give him the out of air signal, he passes you his snorkel?
- d. When you indicate you are low on air, he writes on his slate "I'll get you some" and swims off?
- e. You give him the 'OK' signal and he gives you the finger?
- f. He spits in your mask for you, but you haven't taken it off yet? 

~~*~~

Is your buddy experienced if:

- a. He asks, "Which one of these thingies goes in my mouth"?
- b. He offers to carry everyone's gear to the boat?
- c. He thinks BC is a comic strip about cavemen?
- d. He's upset when you tell him his dive computer doesn't run Windows 98?
- e. He pees in his wetsuit before he gets in the water?
- f. He argues that nitrox was a monster who battled Godzilla?
- g. He says "Oh, I just wait 'til I get that 'tingling feeling', then I know it's time to surface"? 



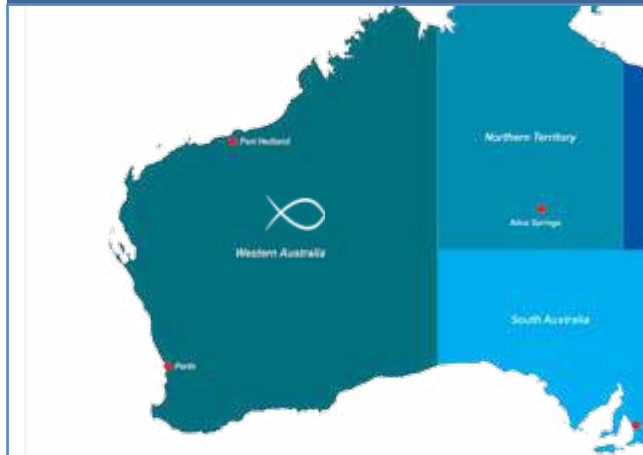


Send your funnies to
johan@ozdiver.com.au





Western Australia



Perth Region

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Australasian Diving Academy



Australasian Diving Academy have 2 convenient locations in Nedlands and Rockingham where the water is right on our doorstep. We have a huge range of top quality diving and snorkelling equipment to suit all requirements.

Phone: +61 (0) 95279211
Mail: info@ausdiving.com.au
Web: www.ausdiving.com.au

Perth Scuba - Canning Vale



WA's largest dive shop, best range of snorkelling, free diving and scuba equipment. WA's PADI Career Development Centre offers courses from beginner to professional and TDI technical training. Perth Scuba has a free dive club offering twice weekly guided dives.

Phone: +61 (0) 8 9455 4448
Mail: info@perthscuba.com
Web: www.perthscuba.com

Perth Diving Academy - Hillarys



PDA Hillarys for all of your dive and snorkelling requirements local and friendly staff to help you make the right choices open 7 days come and see us down at the Hillarys Boat Harbour just north of the boat ramp see you there

Phone: +61 (0) 89 448 6343
Mail: troy@perthdiving.com.au
Web: www.perthdiving.com.au

OZDiver Dive Group - Perth



We focus on scuba diving at all levels and explore locations. We welcome any qualification level of divers including snorkel divers wanting to learn more about diving, and get onto club diving events to meet likewise divers.

Phone: +61 (0) 450 800 238
Mail: izak@ozdiver.com.au
Web: www.ozdiver.com.au

Scuba Imports & The DiveTub - Perth



Since 2007 to service the Australian Dive Industry with the best scuba equipment available. We offer high-end gear, including recreational, technical and commercial equipment. Wherever possible we'll price match any online dive store to ensure you get the best deal!

Phone: +61 (0) 8 92400163
Mail: info@scubaimports.com.au
Web: www.scubaimports.com.au

Dolphin Scuba Diving - Welshpool



Perth's friendliest dive shop. Learn to dive in as little as 2 days! Small groups with a flexible schedule. Weekly. FREE Sunday Morning Shore. Providing Instructor training, Rebreather courses and support. Technical diving tuition and trips. Local and international diving holidays.

Phone: +61 (0) 8 9353 2488
Mail: dolphin@dolphinscuba.com.au
Web: www.dolphinscuba.com.au

Scubanautics Diving Academy- Rockingham



Welcome to Scubanautics, where customer service and satisfaction is our main goal. Drop in to say hello, our friendly staff are happy to help. Check out our new "online Store"

Phone: +61 (0) 8 9527 4447
Mail: info@scubanautics.com.au
Web: www.scubanautics.com.au

Wizbang Diving Solutions - Perth



Technical Training for divers. The development of safe and technically competent divers through specialized training. Rebreathers, Mixed Gas or even just Nitrox, we will help you develop the skills and confidence that will carry you into a safe and enjoyable future.

Phone: +61 (0) 41 876 1727
Mail: diving@wizbang.com.au
Web: www.wizbang.com.au

Western Blue Dive Charters- Mindarie



We are the only dive company north of Fremantle that operates seven days offering double dive charters, returning before lunch, and allowing you to catch crayfish if you wish. Being a small company we offer a personalised service at an affordable price

Phone: +61 (0) 40 954 5553
Mail: info@westernbluedive.com.au
Web: www.westernbluedive.com.au

Underwater Explorer's Club of WA



Our club has a 12m purpose-built aluminium dive boat which can take 14 divers comfortably and is equipped with all appropriate safety equipment. We dive almost every weekend and have over 150 recorded dive spots around Rottnest and surroundings.

Phone: +61 (0) 402 310 854
Mail: committee@uecwa.com.au
Web: www.uecwa.com.au



Mandurah

Oceano Sun Sand & Sea



Welcome to Oceano your local dive shop. We have the friendliest staff best price, awesome range and we proud our self's for the excellence in training. We provide full support for all your dive needs!!

Phone: +61 (0) 85 352 047

Mail: info@oceanosunsandsea.com

Web: www.oceanosunsandsea.com

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Octopus Garden Dive Charters



Just 1.5 hours south of Perth is Bunbury, home of the Lena Dive Wreck (18 metres) & abundant local & coral reef(0-33 metres), including "Blade Coral"—photographers paradise. Small groups –experienced & personalised service. Comfortable, enclosed diesel powered vessel.

Phone: +61 (0) 43 892 5011

Mail: kimroyce@gateway.net.au

Web: www.octopusgardendivecharters.com.au

Geralton

"A" Team Divers



A - Team Divers offers internationally recognized NAUI and SSI scuba diving courses. Small groups ensure personal attention during your training. We also have an active social club for after course adventures!

Phone: +61 (0) 45 828 5497

Mail: geoff@ateamdivers.com

Web: www.ateamdivers.com

Exmouth

Dive Ningaloo - Exmouth



Dive Ningaloo pride themselves in taking small groups to only the best dives on the Ningaloo Reef, Murion Islands and more. All courses welcome. With over 20 years experience diving in the Ningaloo, we know where the best diving is!

Phone: +61 (0) 4 567 02437

Mail: info@diveningaloo.com.au

Web: www.diveningaloo.com

Snorkel Ningaloo - Exmouth



Take your snorkeling experience to a new level! Using your own Seadoo underwater scooter, you'll be propelled effortlessly through the beautiful Ningaloo, where you'll see the tropical fish and coral that makes Ningaloo one of the world's top snorkeling destinations.

Phone: +61 (0) 45 670 2437

Mail: info@snorkelningaloo.com.au

Web: www.snorkelningaloo.com.au

Albany

Southcoast Diving Supplies



Diving Albany means experiencing anything from Wrecks to Reef. The "Perth and Cheynes 3 are two well known dive wrecks and the spectacular reef dives ranging from 3-50 M plus offers a diverse choice to a wide variety of divers

Phone: +61 (0) 89 8417 176

Mail: whale@divealbany.com.au

Web: www.divealbany.com.au

Esperance

Esperance Diving & Fishing



We operated since 1983 is Esperance's only dive store. Servicing locals and tourists with hire, sales, equip service, training and charters. With over 104 islands the dive sites are endless. Also offering guided dives to view Leafy Sea Dragons.

Phone: +61 (0) 89 071 5111

Mail: jaimen@esperancedivingandfishing.com.au

Web: www.esperancedivingandfishing.com.au

South Australia



Port Lincoln

Calypso Star Charters - Port Lincoln



PDA Hillarys for all of your dive and snorkelling requirements local and friendly staff to help you make the right choices open 7 days come and see us down at the Hillarys Boat Harbour just north of the boat ramp see you there

Phone: +61 (0) 86 82 3939

Mail: info@sharkcagediving.com.au

Web: www.sharkcagediving.com.au

ND Scuba - McLaren Vale



We are a small business that go above and beyond .we pride ourselves on providing safe and fun-filled courses at affordable prices. You get trained on a more personal level through to one on one, or small group tuition.

Phone: +61 (0) 88 323 8275

Mail: barrettn80@hotmail.com

Web: www.nbscuba.com.au

Adelaide

Diving Adelaide



Diving Adelaide is Adelaide's newest PADI 5 Star Dive Centre. We run all PADI courses as well as Leafy Sea Dragon Tours. Diving Adelaide is located next to the tram and bus-stop in Adelaide; easy to reach with public transport.

Phone: +61 (0) 8 73 250 331

Mail: info@divingadelaide.com.au

Web: www.divingadelaide.com.au

Underwater Explorer's Club of SA



The UEC is the oldest recreational scuba diving club in Australia, established in 1954. We do regular dives at locations within metropolitan Adelaide and have frequent trips to regional South Australia. Why not come and join us for a dive.

Phone: +61 (0) 417 838 387

Mail: secretary@uecofsa.org.au

Web: www.uecofsa.org.au



Dive Operators

Australia

Glengowrie Downunderpix



Downunderpix is an underwater photography business established in South Australia. We provide all things underwater photography to the local, national and international markets. This includes supplying a range of underwater photography services as well as selling underwater camera equipment and scuba diving equipment.
Phone: +61 (0) 41 981 9083
Mail: info@downunderpix.com
Web: www.downunderpix.com

Victoria



Geelong Australian Diving Instruction



Australian Diving Instruction is a PADI 5 Star IDC facility Offering everything for the Diver from Learn to Scuba Dive to Instructor including PADI Tec 40,45,50, Equipment Sales and Service National and International Dive Trips and Dive Holidays also Dive Charter Boat.
Phone: +61 (0) 40 836 5216
Mail: adigeelong@optusnet.com.au
Web: www.ausdivinginstruction.com.au

Bay City Scuba



Bay City Scuba is Geelong's premier dive shop. Offering all levels of training from Freediving through to Technical training and offering a huge selection of equipment to your diving needs. A RAID training facility offering extensive technical OC & CC rebreather training.
Phone: +61 (0) 35 248 1488
Mail: info@baycityscuba.com
Web: www.baycityscuba.com

Extreme Watersport



Extreme Watersport Specialises in all recreational, educational and technical SCUBA diver training, charters and tours. Extreme Watersport is Melbourne's premier 5 Star SDI/TDI Instructor Scuba Diving Training Centre. We are also house a wide range of scuba gear for sale.
Phone: +61 (0) 3 5982 3432
Mail: info@extremewatersport.com.au
Web: www.extremewatersport.com.au

Dive Victoria Group



Our Training, Dive Charter and Group Accommodation services cater for local, interstate and international divers. On our doorstep we have amazing wall dives from 10-100m that we can dive every day and wrecks 8-80m in the Ships Graveyard
Phone: +61 (0) 3 5258 4188
Mail: info@divevictoria.com.au
Web: www.divevictoria.com.au

Rye

The Scuba Doctor Australia



The Scuba Doctor is an online and in-store dive shop stocked with quality brand recreational, technical and commercial diving products. Low prices on scuba, spearfishing, freediving, snorkelling and watersports equipment, plus Air, Nitrox and Trimix fills.
Phone: +61 (0) 3 5985 1700
Mail: diveshop@scubadoctor.com.au
Web: www.scubadoctor.com.au

New South Wales



Sydney Plunge Diving



We are the only PADI and TDI dive center located on the waters of Sydney Harbour. We teach courses from Open water to Instructor level, and provide technical training. The Plunge dive boat offers dive trips for all certification levels.
Phone: +61 (0) 2 99695733
Mail: info@plungediving.com.au
Web: www.plungediving.com.au

Dive Operators

Australia

Southern Cross Divers



Southern Cross Divers is best known for rebreathers and "tec" diving - we do nothing else but "tec". We will not stock a unit unless we can offer the customers a complete solution to all their CCR needs. We are Australia's CCR specialist store.
Phone: +61 (0) 2 9969 5072
Mail: barry@southerncrossdivers.com.au
Web: www.southerncrossdivers.com.au

Underwater Research Group of NSW



URG is a not-for-profit scuba diving club with a regular boat & shore dive schedule in Sydney and surrounds. Join our club to explore local dive sites and if you like, get involved in research projects to help marine conservation.
Phone: +61 (0) 418 257 462
Mail: info@urgdiveclub.org.au
Web: www.urgdiveclub.org.au

Killarney Vale

Pro-Dive Central Coast



Located between Sydney and Newcastle with daily boat dives to the ex-HMAS Adelaide artificial reef, only minutes from the local boat ramp. Online booking and dive sales available 24/7. PADI Instructor programs available.
Phone: +61 (0) 2 4389 3483
Mail: info@prodivcentralcoast.com.au
Web: www.prodivcentralcoast.com.au



Dive Operators

Australia

Nelson Bay

Feet First Dive



Jump in FEET FIRST with Nelson Bay's friendliest dive centre. Explore & enjoy the amazement of our Marine Sanctuary from the shore; take our boat to the local Grey Nurse Shark colony; OR Rebreathe our selection of Wrecks

Phone: +61 (0) 2 4984 2092

Mail: enquiries@feetfirstdive.com.au

Web: www.feetfirstdive.com.au

South West Rocks

South West Rocks Dive Centre



Our Training, Dive Charter and Group Accommodation services cater for local, interstate and international divers. On our doorstep we have amazing wall dives from 10-100m that we can dive every day and wrecks 8-80m in the Ships Graveyard

Phone: +61 (0) 2 656 66474

Mail: info@southwestrocksdive.com.au

Web: www.southwestrocksdive.com.au

Queensland



Sunshine Coast

Sunreef Mooloolaba



Sunreef Mooloolaba offers the ultimate water experiences on Queensland's Sunshine Coast. From diving the HMAS Brisbane and local reefs, to Swimming with Humpback Whales from July to November, to stand up paddle boarding, kayaking and bubblemaker kids programs.

Phone: +61 (0) 7 5444 5656

Mail: dive@sunreef.com.au

Web: www.sunreef.com.au

Scuba World



Dive one of Australia's top ten dive sites the Ex-HMAS Brisbane. We are the only operator that comes back to the sheltered waters of Mooloolaba bay for a relaxing morning tea. Enjoy hassle free diving from our private marina berth.

Phone: +61 (0) 7 5444 8595

Mail: rob@scubaworld.com.au

Web: www.scubaworld.com.au

Brisbane

Ozaquatec- Brisbane



Brisbane's largest dedicated scuba service centre, Ozaquatec has all of your servicing needs in one place at competitive rates. Our fast, friendly and professional customer service gives you, the diver, complete peace of mind.

Phone: +61 (0) 404 043 869

Mail: admin@ozaquatec.com

Web: www.ozaquatec.com

Gold Coast

Devocean Dive- Gold Coast



Devocean Dive is South East QLD's Premier PADI 5 star Instructor Development Centre. We offer unsurpassed service is a safe, fun environment with qualified, experienced Instructors. We look forward helping you achieve your SCUBA diving goals.

Phone: +61 (0) 75 528 0655

Mail: admin@devoceandive.com

Web: www.devoceandive.com

Brisbane

Tech Dive Academy- Port Douglas



You deserve the multi-award winning service of the ORIGINAL bespoke private diver training company - Serving Port Douglas since 2003. First for Bespoke Diver Training, the Dive Centre offers all levels of Recreational and Technical Dive courses.

Phone: +61 (0) 422 016 517

Mail: info@tech-dive-academy.com

Web: www.tech-dive-academy.com

List your Dive School or Dive Company here.

For a listing in OZDiver Magazine contact us at info@ozdiver.com.au

Dive Operators

Australia

Tasmania



Bicheno

Bicheno Dive Centre



Tasmanian diving at its best 32 different boat sites 16-40 meters 8 different shore dives with max depth of 20mtrs Boat travel time under 5 mins. Home of the weedy sea dragon.

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Web: www.bichenodive.com

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Mail: info@africadivesafaris.co.za

Web: www.africadivesafaris.co.za



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Peter Pincock

