



Established 1962

# WET RAG

[www.southpacificdivers.com](http://www.southpacificdivers.com)

Winter | 09

## Winter Diving Special

### ***Inside this issue:***

Burst a disk with Paris Hilton

Go down on the Catterthun

George Roberts Photo Feature

...and much more

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## Club President's Report



The May 2009 meeting of SPDC saw the conclusion of the running of the George Roberts Memorial Photographic Competition, which had been running over the three months of February, March and April. The competition was a celebration of a former member who had a passion for furthering underwater photography within the club ranks at a time when the housing and camera flashes were home made.

The competition was entered by 9 Novice Photographers and 5 Open Photographers. Judging of the images was carried out by former SPDC Photographic Officer, Brian Colwell, AUPY winner Max Gleeson, non diving Photo Journalist Jenni Johnstone and myself.

This was my first ever association with a photography competition and it was an interesting learning curve all the way. Every month I looked forward to viewing the submissions as they arrived on my email. Each entrant had their own particular style and capability. Photography is as subjective as Art and each Judge had an appeal to certain aspects, however quality rose to the top giving us a very entertaining competition. The hard work of organising this memorial competition has been done and will be easy in the future. The aim of the competition was to improve the abilities of our members. I think the seeds have been sown and the involvement by member photographers has gained strength and capability.

In the immediate past months wreck diving has crossed a few milestones with the 90th Anniversary of the sinkings of the Tragic Trio, S.S. Undola, S.S. Myola and finally the S.S. Tuggerah. Unfortunately I have been out of the water having a section of my spine collapse trapping nerves. Hence I missed the last two anniversary dives. Diving within the club seems to be very active. Diving is happening every weekend and several people at diving during the week. More of an effort to promote each dive through the email channels or on the forum would be of great benefit to members.

We have in recent months had a surge of new members into our ranks, Bob Tomlinson, Andrew Henderson, Todd Murdock, David Lill and most recently Paul Godbee. It has been pleasing to see some of them to become regulars on dives and even organising dives! Great work, make yourself known to members and members please make these new divers feel welcome.

Our Club is strong both financially and in spirit. Lets keep the ball rolling through winter and we will have a good season diving.

Geoff Cook  
President

## Editors Report

We're back! Yes after a brief break the Wet Rag is back!

This issue has a couple of great articles on wreck destinations and an article on decompression. More importantly there is a round up of the George Roberts Photo Competition with a selection of some of the entrants images. I'm sure you'll agree that the standard and quality is world class. Not bad for a small interclub competition.

I've been busy travelling overseas quite a bit this year and have managed to dive Subic Bay in the Philippines and the Red Sea, both fantastic dive destinations. It's too bad the Red Sea is a 20+ hr flight because it really has the best coral reef in the world.

It leaves our Barrier Reef for dead because they have no storms to damage the coral. In fact it is perfect weather all year round with only a few days of rain in the year.

Next stop for me is Fiji in 2 weeks time and the Philippines once again later in the year, this time to dive with whale sharks and thresher sharks.

From reading the forum posts about the local diving it seems there have been some great dives done recently at Bass Point and Jervis Bay. If you haven't dived those spots put them on your 'to do' list.

See you in the water sometime soon,  
Scott Leimroth

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# CLUB NEWS

Joff & Jenny Got Married!!



CONGRATULATIONS from all at SPDC!

Club member, Shiprock Dive owner and all round good guy Jonathan Dolden recently married his long term love interest (No he didn't marry his dive gear) Jenny. Congratulations to them both from all at SPDC.

## Get Well Soon

Former Club member Noel Taylor was admitted to RNS Hospital after a Motor Cycle Collision. Get well soon Noel, from all your mates at SPDC.



## WANT TO COME DIVING?

FIND OUT WHAT'S ON AND WHERE!

Join our google group to keep up with the latest information.

<http://groups.google.com/group/spdcdiving>





# JOIN US FOR SOME FUN



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**including regular local club dives,**  
**trips away and great social events.**

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Images and Text by Jason Farlow

My young bloke Nick and I travelled down to Jervis Bay to do a day of diving with Paul Daniels. After a 3.5 hours drive south we arrived at Paul's place nice and early to launch his boat at Murray's Beach in the National Park. This was going to be Nick's first ever boat dive.

We were to meet up with Warwick and Lee, but some problems saw them diving separately on the day.

For the first dive Paul, his mate Jake, Nick and I dived the northern side of Bowen Island. As we headed down the anchor line we were greeted by a weedy sea dragon, which was swimming dangerously close to the moving anchor chain. We herded it away and it disappeared into the ether.

Paul managed to find an adult and juvenile Eastern Blue Devil fish, other life consisted of an adult and juvenile cuttlefish, green moray and countless nudibranchs.

We also came across an "underwater listening station", also known as known as SEACAMS (South East Australian Coastal Acoustic Monitoring System). They are installed by DPI on the seabed at many locations along the New South Wales coast to monitor the movement patterns of the Grey Nurse and Great White sharks.



Left: Cuttlefish



Below: Eastern Blue Devil Fish



After changing tanks back at Murray's beach, we headed further down south to see if we could catch up with Warwick and crew. After no success we headed to the local seal colony for a swim with the resident fur seals.

We were a bit concerned when we anchored, as there were no seals in the water – the saying goes “if there aren't any seals in the water – don't get in”. We contemplated our next move, when all of a sudden a seal was in the water close to the boat. Unfortunately it had some large bite marks in it and it didn't look to healthy.

We decided to gear up anyway, as the wounds didn't look too fresh. Paul was the first in the water, followed by Nick, myself, Jake then about 40 of the seals, diving in from rocks above.

The seals were amazing, I was surprised about how much attention they gave us, considering the amount of divers that must dive with them. The seals would come quite close to inspect us; one particular one came very close to me, actually rushing my camera – I was actually recording video at the time, so I got the “attack” on film.

These three photos: Playing with the seals.





All good things come to an end, so it was time to ascend to the boat. I started pulling the anchor, when we noticed a seal on the rocks that must have eaten some bait attached to a fair amount of fishing line. The other end of the line was stuck in the rocks and the seal was in a bit of discomfort trying to pull on the line. Jake did the honours, jumping overboard to the rescue. Like something from an Alby Mangels documentary, he scaled the sheer cliff face, knife between his teeth. He managed to get close enough to the seal and cut the line, allowing the seal to move about.

After the good deed, we headed to the local dive shop Crest Diving for some air fills and a cup of coffee.

A BBQ was organised at Paul's place afterwards where we were to meet up with Warwick and crew, unfortunately Nick and I had diving commitments early next day so we had to get home.

Nick certainly had a great introduction to boat diving, a great part of the world to dive – massive thanks to Paul for the day.



Above: A playful seal gets up close.

Left: The seals turn on the entertainment.

Right: The seal entangled in fishing line.





# Burst Disks

By Neil Vincent

We were going nowhere in a traffic jam on Pennant Hills road, it was Boxing Day, we should have known better but we were young and excited to be going to the north coast for a week's diving. The inside of my Hi Lux Ute was hot and getting hotter as the sun crept towards it's apex. We probably had some music playing on the cassette player, the windows wound down to try and catch any cool breeze that may find it way in.

Without any warning there was an explosion, an incredibly load roar that didn't end, it continued with ear hurting effect. Fearing it was the fuel tank exploding Lyn and I leapt out of the car and ran between the lines of stationary traffic, other drivers along side us did the same. Looking back from a safe distance we watched, waiting for the cars to be engulfed in flames, nothing appeared to be happening. After what seemed like minutes but was only about thirty seconds the roar diminished to a hiss.

That was thirty years ago.

Last week, we were both in a deep sleep at home, it was just past midnight, the night was cool and still. From a dead sleep to running for the door wide awake, happened in one motion, the roar was coming from downstairs in our garage, it sounded like a jet aircraft was trying to take off, looking outside I could see nothing happening. After about thirty seconds the noise reduced to a hiss. About the same time my mind came out of auto self preservation mode and started to process the information more logically.

What did these two incidents have in common, both were the result of the rupturing of the burst discs in scuba cylinders.



## What is a burst disc?

## What causes them to rupture?

A burst disk is a pressure relief device that protects a scuba cylinder from being over-pressurized, usually during filling or when tanks are left in the sun. Burst discs have a one-time-use membrane that fails at a predetermined pressure. The membrane is usually a thin metal foil. Burst discs provide fast response to an increase in system pressure but once the membrane has failed it will not reseal. In this way the disc fails and releases all the air safely before the cylinder pressure increases to where the cylinder fails with potentially devastating results.

The disc is located in the tank valve usually beneath a hexagonal bolt. The bolt head has holes drilled through it to allow the escape of air once the disc has been ruptured.

Now lets look at our two scenarios. The first one is typical for a ruptured disc, cylinder filled to working pressure and left in the hot sun with no breeze or cooling. As the temperature rises so does the pressure of the air within the cylinder. Once it exceeds the design pressure of the burst disc but is still less than the bursting pressure of the cylinder, the burst disc ruptures and releases all the air.

But scenario two was a full cylinder, only three years old, on a cool night. It should not have ruptured. It wasn't until I took out the burst disc did I realize what may have caused it to rupture. As I said before,



what holds the burst disc into the valve is a hexagonal bolt with holes drilled through it. These holes are open to the atmosphere so during a dive water can enter coming into contact with the surface of the burst disc and will stay in this orifice after the dive unless flushed out with fresh water. I wash my cylinders after each dive but don't really pay much attention to the cylinder valve. The ruptured burst disc had signs of corrosion so with the circumstances we had, I would suggest that corrosion may have been the cause.

Replacing a burst disc is not difficult. Remove the bolt, take out the ruptured disc, replace with the new disc, replace the bolt.

Preventing the problem in the first instance is a better solution. From now on I will make sure I put the hose over the burst disc bolt.

Cylinder valves are a neglected item of equipment. They should be serviced at the same time you have your regulators serviced. Speaking with our service technician he said that as part of the valve service the burst disc was replaced.

Why is this important, even though we own 12 cylinders and this was only the second burst disc failure in thirty years, the next dive I should have done with this tank was to 190 feet but it was called off because of bad weather. This was three days before it ruptured.

If I had survived the initial shock of the noise and bubbles, the rest of the dive would have been interesting.



## Feeling Lonely?

*We've got plenty of dive buddies for you to pair up and dive with. A lot of our diving is inexpensive and fun boat diving.*

Contact us via our website to find out how you can come diving with us, meet new friends and have some fun with our club on a dive. You don't have to be a member to come along and enjoy yourself.

## A Little Nervous?

Come along to one of our relaxing, divemaster assisted, dives. We'll even hold your hand if it helps. Join us for an easy supervised dive.

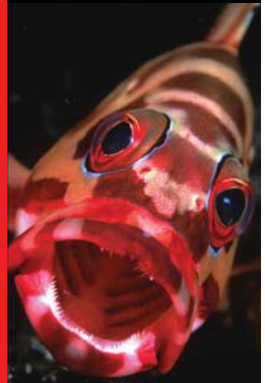
## The Next Step?

Been diving for a while and ready for the next step?  
Sick of the same old dives?

Meet some of our experienced divers and learn from them. We cater for divers of all skill levels, from our active juniors group right through to our rebreather special interest group and beyond.

Come along and join us on our next club dive or club meeting.

Remember, you don't have to be a club member to check us out.



# CREATURE FEATURE



## Pineapple Fish (*Cleidopus gloriamaris*)

Words and Images by Dave Harasti

**“A fish that resembles a piece of fruit, now that is something you don’t get to see everyday!”**

The Pineapplefish (*Cleidopus gloriamaris*) is a very unusual fish species that has a remarkable resemblance to the Pineapple fruit; hence it’s common name. De Vis first described this species in 1882 in his descriptions of some new fish species from Queensland and it is also commonly referred to as the ‘Knightfish’.

The Pineapplefish is easily recognised by its yellow coloured body with conspicuous black outlines on the scales forming a network pattern similar to that of a pineapple. The scales are very tough and act as armour whilst there is small light organ that can be found on either side of the lower jaw that produces a greenish glow. It is believed that the colour of the light organ changes from green to red as the fish matures. This light organ is best seen at night as it is luminescent and the Pineapplefish uses it to attract small microscopic prey to its mouth to feed on. The Pineapplefish grows to a maximum length of approximately 25 cm.

This species can be found on the east and west coasts of Australia but has not been recorded in Victoria, South Australia or Tasmania. It is generally found inhabiting rocky reefs within estuaries and coastal embayments however some individuals have been trawled in fishing nets from depths of 250 metres. Divers generally see it from depths of 5 to 25 metres. A similar looking species, the ‘Japanese Pineapplefish’ (*Monocentrus japonicus*) can also be found in Australian waters however it can be distinguished from the Pineapplefish by its more rounded snout.



The Pineapplefish is generally found in small caves and under ledges where they aggregate in small groups. At the Fly Point divesite in Port Stephens a group of Pineapplefish have been found living under the same ledge for a period of at least 7 years and another colony has been living under a ledge at 25 metres at Halifax Park for approximately 3 years.

There are several locations along the New South Wales coast that divers can visit and regularly find Pineapplefish hanging out in the same location for a long period of time. This fish is a very popular species with scuba divers and it can be tricky to photograph as they generally hide in the darkness at the back of a cave or ledge away from the prying lens of a camera! This species is also well-liked by aquarium enthusiasts, as individuals have been recorded for living up to 10 years within private aquariums. Even though this fish resembles a Pineapple it is reported that it is not very good eating!





**The Catterthun is a shipwreck laying in about 190 feet of water off Seal Rocks in NSW. Due to many factors which effect the site, it is difficult to dive, resulting in about a 25% success rate.**

The wreck is only about two kilometres NE of Seal Rocks. Unfortunately Seal Rocks does not have a boat ramp and the only boats able to be launched there are small tinnies or rubber boats. These have to be launched across the sand with 4WD or tractors. In order to use a large boat to dive the wreck, it has to be large enough to travel the 30 kilometres from Forster and return.

The trip to the Catterthun has become an annual event. Rod Pelling takes his boat to Tuncurry for a week covering two weekends. The two weekends are set aside to try to dive the Catterthun. This year on the first Friday night the weather forecast for the weekend was for gale force winds on the Saturday and a big ground swell for the Sunday. Diving was not going to happen so the team was reduced to just Rod, Lyn & I.

We treated it as a weekend away & had a great time with dinners at the pub, exploring the forest trails to the south west, a trip up to Crowdy Head & as the cinema is at the end of the street, we saw the new movie "Wanted". Definitely worth seeing.

Once back at work, Monday and Tuesday were perfect. Rod was still up there and used the conditions to look for some new dive sites.

Those who could get out of work travelled back up on Thursday afternoon as the best two days of the weekend looked like they would be Friday and Saturday.

Lyn V ,Lyn B & Rod dived the Pinnacle on Friday with calm seas & winds and reasonable visibility.

Friday night the rest of the crew arrived. Steve, Robb & Janet & myself. The pub was the venue for dinner but after dinner, for most, it was off to bed early as we needed a 7 am start to beat having to bash into the predicted NE wind on our return to Forster.

# CATTERTHUN

Images and Text by Neil Vincent



At 7.15 we were heading across the bar, there was not a ripple on the water, it was a perfect day.

The trip south took about 50 minutes. The GPS & sounder found the wreck & the anchor was sent tumbling through the blue water towards the wreck. Yes, blue water. There was current, it dragged the anchor until it bit in & the boat swung around into it.

One of the problems on this wreck is the current which is often quite strong. On Saturday it looked manageable. One of the other problems encountered on the wreck is sharks. They tend to very “annoying” during decompression, when they school and terrorise the divers. I have heard many bad stories from divers who have had this happen on the Catterthun but so far have not experienced it myself. To prevent this happening to us, earlier in the year, we purchased a Shark Pod for the boat. This device emits an electronic field large enough to envelope the divers while they hang under the boat. Unfortunately for Saturday’s dive we left it in the garage!!! The manual actually states that to be effective, it needs to be in the water, under the boat and switched on.



Once anchored & all the safety gear had been secured over the side, we geared up with the assistance of Steve and Lyn V who were not diving but were going to boat keep. On deep dives it is very reassuring to have good boat keepers & people to assist in gearing-in.

Robb was ready first, he rolled over to test the current, it was manageable so he swam forward to the anchor rope to wait for me. I followed, but after rolling in, I had managed to clip the camera lanyard over the current line we had rigged, so I wasn't going anywhere with that configuration. Lyn B & Rod would follow so Robb & I descended. In the clear vis we could see each other but Robb moved more quickly, at 150 ft I stopped to change to trimix, Robb continued down.

When I arrived Robb was hovering above the anchor which was securely hooked into the wreck. I was to learn later that the anchor had been sitting in the sand about a metre from the wreck when Robb arrived & he had spent the time before I arrived hauling the anchor & boat that one metre to secure the anchor.

At first I did not recognise where we were on the wreck, it was just mangled metal on the bottom, we chose to go to the east to get our bearings. Before the dive we had discussed what each of us wanted to do on the dive, I was happy to photograph any part of the wreck on which we landed & Robb wanted to search around the boiler area looking for those remaining gold bars. After swimming only a couple of metres I could see the massive conglomeration of rusted steel chain links which was the chain locker & the bow. It towers



above the sand. We swam to it. The mass of chain that is in the chain locker is very large, with time the chain has rusted into one large piece, so unlike other sections of the ship which have succumb to rusting & storm surges the bow section has remained intact supported by the rusted chain. I took some photos. We then turned & headed back towards midships to see what other interesting things we could see.

Swimming across the broken down section forward of the boilers was a tangle of broken down ship structure. Larger dense pieces which have not broken down such as winches were clearly obvious but other sections require a skilled eye to determine what they once were.

We only had a 15 minute bottom time. After the dive Robb passed the comment that the bottom time just flew by. From past experience this is one of the symptoms of nitrogen narcosis, you no sooner arrive on the bottom & it is time to leave. This was one of the reasons I changed to trimix for the bottom part of this dive. This gas gave me a equivalent air depth of about 100 ft (but with a significant cost penalty) so even though I thought the dive was short (I think all dives are too short) I probably perceived the dive to be it's real length.

We did get to the other side of the broken down section before we both realised that it was time to head back to the anchor. As we rose up the anchor, the wreck opened out before us on the bottom.

My first deco stop was at 100 ft, so began my slow ascent back to the surface. I felt the current drop when Rod released the anchor from the wreck below and allowed it to drag free in the sand. Sharks entered my mind when I was engulfed twice in a large school of bait fish which some Kingfish had condensed into bait ball. The Kingfish were fine, I was concerned that there may have been some larger predators attracted by the commotions. When doing deco, I like to be unnoticed.

Back on board Robb had a very bad headache, anything out of the ordinary like this after a deep dive requires attention whether the diver wants it or not. Some quick questions revealed his episode with moving the anchor at the beginning of the dive & the onset of the headache as soon as he began to ascend. The symptoms & situation sounded like the cause was a build up of carbon dioxide brought about by short breathing while working hard at depth. Oxygen is a cure all, if in doubt put the patient on oxygen, we started Robb breathing pure oxygen and gave him a paracetamol tablet. By the time we reach the river

mouth back into Tuncurry Robb was feeling better. For my own information I later checked "Diving Medicine" by Dr Carl Edmonds & for headaches from high CO2, what we prescribed Robb was what was recommended.

On the drive back the wind was still calm, & Steve kept pointing out whales breaching. He suggested the position where he believed the next surfacing would be, so we headed to that spot & waited. Nothing happened so we decided to have some morning tea. No sooner had we dropped our vigilance when 50 ft from the boat a whale broke the surface in spectacular fashion, then another, seemingly oblivious to us the continued rolling south towards the Antarctic.

Sunday the weather was total crap again but Monday & Tuesday were perfect, except we were all at work.

One out of four isn't bad.



The Bow of the Catterthun

## SEE SYDNEY'S WRECKS LIKE YOU'VE NEVER SEEN THEM BEFORE!

Award winning photographer Max Gleeson takes you on a journey to three of Sydney's 60 miler wrecks.

### THE TRAGIC TRIO AVAILABLE NOW!

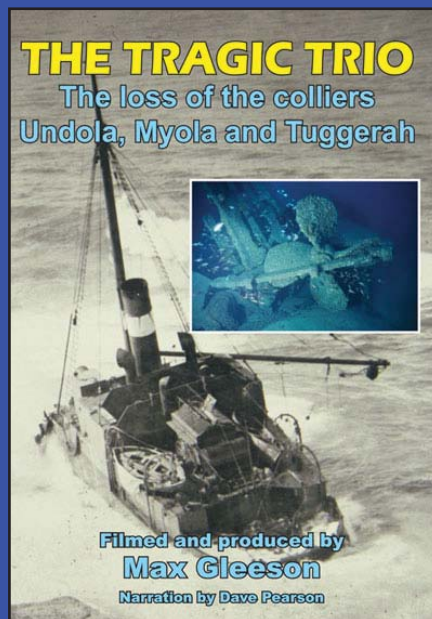
The Tragic Trio recalls the events surrounding a short but disastrous period of Australia's maritime history. Between December 1918 and May 1919 three colliers foundered within sight of the coastline. The sudden loss of the Undola, Myola and Tuggerah took the lives of 26 men and led to a Royal Commission into the operations of the coal ships running between Sydney, Newcastle and the Illawarra coal fields.

Combining stunning underwater footage of the shipwrecks and their associated marine life with archival film and images, maritime historian and underwater photographer Max Gleeson recreates the events of each disaster, examining the individual wreck sites for evidence that may have led to the loss of the "sixty milers".

Filmed on a Sony FX1 High Definition Camera using an Amphibco Phenom Housing.

Runtime: Approx 1 hour.

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Please ensure that this number is included on all application forms submitted to DAN even if you apply online via their website.

The Club will receive points for each NEW member that signs up with DAN and quotes the number above. These points can then eventually be redeemed for merchandise, hopefully we will be able to get an oxygen first aid kit or even some books for the club library.

We only receive points for signing up new members and only for members who are residents or nationals of the Asia-Pacific region (excluding Japan).

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# This month's Celebrity Diver

## Paris Hilton

Name: Paris Whitney Hilton

Height: 5' 8" (1.73 m)

Socialite Paris Hilton was born on February 17, 1981 in New York City into the Hilton family and, along with her three younger siblings, is heir-apparent to the vast Hilton hotel and real estate dynasty. Her childhood was spent in palatial dwellings in the priciest neighborhoods on both coasts and featured a brief flirtation with the educational system, including high schooling at the ultra-exclusive Dwight School, from which she dropped out and ultimately earned her high school GED.

not buy alteration of the physical attribute she most dislikes about herself: her exceptionally-large feet. of-water reality series "The Simple Life" (2003).

Hilton is widely scorned for what some see as her narcissism, shallow intellect and materialism and for other things besides, but she seems to be aware of the old adage that there's no such thing as bad publicity and it should be evident even to her detractors that she is ambitious and driven to achieve, rather than simply basking in her family's vast fortune, as do so many other socialites.

Paris recently learnt to dive with her boyfriend Doug Reinhardt while on vacation in Maui.





**LOOKING FOR SOMETHING MORE?**

**THEN WHY NOT COME ALONG TO ONE OF OUR MONTHLY MEETINGS OR BETTER YET CONTACT US VIA OUR WEBSITE AND COME ALONG ON A CLUB DIVE.**

**[WWW.SOUTHPACIFICDIVERS.COM](http://WWW.SOUTHPACIFICDIVERS.COM)**

Image by Noel Taylor



On June 11th Lesley H and I set off for Melbourne with a date with the Spirit of Tasmania. We boarded the vessel at 7pm and by 8pm we were under way, bound for Davenport Tasmania. It was a perfect night for travel, which is just as well for Lesley. She has been known for the occasional bout of seasickness.

We arrived at 7am and set off for Eagle Hawke Neck, some 350 klm down the coast to the south end of the island. It was here that we teamed with our good friends Andreas and his lady Hazel. Also on this trip were central coast divers Steve Lamb, Lyn Baxter and north shore resident Andy Stark.

Next morning in very dark and dismal conditions we boarded a 7 metre shark cat and set off for the 40 minutes run down the coast. This boat has no seats so we all plonked ourselves on the floor, all wearing waterproof jackets supplied by the operator, trying to keep out of the wind.

It was surprisingly a quick and good run down the coast to the site, which is located in a very protected bay, only 200 metres from huge cliffs.

Water temp of 12 degrees was not really an issue as the wreck lies in the fairly



shallow depth of 41 metres. So the run time is not all that long. However, don't go there without a dry suit.



Left: Huge sea caves



Above: Max on the Spirit of Tasmania

Below: Rock formations with massive cliffs.



The stern is largely intact and is the feature of the site. The wreck is covered in the most amazing colours, which always are predominate when diving in the cooler waters.

We dived the wreck a few days later, this time with the sun shining, and what a difference that made. After the dive the operator took us site seeing down to Tasman Island. The huge cliffs and stunning rock formations were worth the price of the dive alone. He brought the boat very close to a seal colony. For a brief moment (very brief) I thought of jumping in and filming the seals. But the island reminded me of the specials you often see on Nat Geo, where the seals run the gauntlet of the White pointers. Now everybody knows how I love sharks but I decided to give this one a miss.

In between diving we went to Port Arthur (great place) and the Island of the dead. This island is located about a half a klm from Port Arthur. It is about the size of Bare Island in Botany Bay and holds the graves of over 1800 persons.

In all it was great trip. Lesley and I were very glad we decided to take the more expensive option of taking the ferry. I gave us a chance to see Tassie.

On the return trip, as the ship approached Port Phillip Bay we were in thick fog. I went up on deck at 4.30 am. The ship was sounding his fog horn. Other vessels in the area were replying to our call. It was enough with anyone with a bit of saltwater in their veins to get goose bumps.



Left: Hazel and Andreas at Port Arthur.



# Deep Stops, Decompression Stops & Safety Stops

## What are they? What should I do?

"An ounce of prevention is worth a pound of cure," a sufficient decompression profile in the first place is always much easier because there is no hard line between "getting the bends" and "not getting the bends" just a fizzy grey area depending upon complex human physiology, predisposing factors and individual variations

By Scott Willan

There has been an increasing amount of talk lately associated with doing additional stops to increase the safety of a dive but what are they? What are all the different names? What is the current thinking towards them?

First some background and basics whenever you go diving you increase the gas loading within your body and when you come back to the surface this gas is transferred back out of your body. If the rate that this gas is transferred back out increase too fast (because of rapid ascents or staying beyond decompression limits without decompression stops) bubble may form in the bloodstream and lead to Decompression Sickness.

Haldane developed the first modern decompression tables modelled on goat experiments in 1906 to limit the effects of Decompression Sickness and involved staging the ascents of divers and casein workers where after prescribed durations at a depth they would ascend to a specific level and stop for a period to allow their bodies to partially eliminate the inspired Nitrogen (or other inert gas). This is the basis of a Decompression Stop.

A Decompression Stop is where the decompression model allows the diver to ascend to the shallowest depth or "ceiling" based on the ascent limiting the partial pressure of the inert gas for a hypothetical "tissue" compartments below that of where bubbles may form.

The key to decompression safety isn't trying to outgas nitrogen as quickly as possible. It's trying to eliminate the nitrogen as quickly as possible while preventing the formation of any bubbles - even the asymptomatic or "silent" kind.

Similar to this is the concept of No Stop or No Deco Diving where the bottom time is limited to that below the requirement for a Decompression Stop i.e. where the decompression model allows the diver to ascend to the shallowest depth or "ceiling" where this ceiling is the surface.

During Doppler studies conducted on humans after diving in the 70's and 80's "silent bubbles" or "micro bubbles" were often found circulating in the blood stream with no discernible symptoms of DCS (it should be noted that these bubbles often did not occur straight after a dive but typically 40 -60 minutes after surfacing) as bubbles have a correlation with DCS (a relationship between both numbers of bubble and the size of the bubbles as to the occurrence of DCS, there is also a correlation between the size of the bubble and the lodgement point of style/severity of the DCS with larger bubble more likely to cause neurological issues i.e. the deeper in the dive the bubbles form the worse the case is) safety stops were developed as a strategy to alleviate potential problems.

A Safety Stop is intended to both slow the overall ascent while maintaining some pressure in an attempt to reduce bubble growth and to give some time for any bubbles formed to be flushed out through the lungs. Bubble models postulate that by preventing bubble growth in the



early stage of ascent, the final size of the bubble will be smaller and have a lower likely hood of adverse effects

Thus a safety stop is a stop that is used to further increase the diver's safety in a non-decompression dive, to help prevent decompression sickness. Speaking in terms of static's a safety stop minimizes the likelihood of DCS. In a technical term they help prevent bubble nuclei growth.

Deep Stops can in part be considered in part as a safety stop for decompression diving. These have come in and out of favour over many years of diving. This style of stop was originally done prior to Haldane and continued by Haldane's 1906 proposal which had a staged decompression at  $\frac{1}{2}$  the absolute depth has now become lost in later forms of diving and yet early pearl divers brought it back in with it only to lose favour again with the US Navy tables of the 1950's onwards and back in favour due to Richard Pyle in the late 80's early 90's with current research throwing issues up as to the current Deep Stops practices.

The initially anecdotal evidence of feeling better after performing these short 'non formal' deep stops, was rapidly confirmed by the many divers who included them in their ascent profile, even though existing decompression models did not require them.

From anecdotal experience deep stops seem to reduce the profound 'dive tiredness' experienced around 90 mins after long deco dives performed without deep stops. Many people feel including deeper stops for deep dives significantly reduces the probability of subclinical DCS (post dive fatigue), as well as full blown DCS, by eliminating micro bubbles early in the deco profile. The post dive fatigue normally goes away within a few hours without any need for recompression treatment and is generally not present on dives which include deep stops. This suggests that carrying out deep stops is reducing the 'decompression stress' my body is subjected to during the dive.

The need for such as system as Deep Stops is somewhat because of the failures of the current decompression models to account for accent rates (both the real accent rate linear related to depth but not changes

in pressure (the driving force of decompression) , and greater use of Helium in diving where the models were originally developed for Nitrogen (while Helium is absorbed 2.6 times faster and hence desorbed 2.6 times faster so the body seeing a faster desorption flux)) and the need in the decompression models for significantly more ascent time may therefore be required to off-gas these critical fast tissues and avoid neurological DCS. This may be far too short for adequate de saturation of a 5 minute tissue that has attained a high degree of saturation.

This has lead of late to increasing issues of confusion and controversy among divers to if these stops are required, and, as to if they are required of how deep these "deep stops" should be and how many such stops should be performed. Much of the empirical observations of divers have led to the development of arbitrary methods for introducing deep stops. Many of these methods involve individual judgement and discretion rather than having a basis in the decompression calculations

## Styles of Deep Stops

Pyle Style Deep Stops are based upon doing an additional stop mid way between your maximum depth and you 1st required decompression stop this mid way depth (can sometimes be calculated as mid way pressure differential) will be your first deep safety stop, and the stop should be about 2-3 minutes in duration. If the distance between your first deep safety stop and your first "required" stop is greater than 10 meters, then add a second deep safety stop at the midpoint between the first deep safety stop and the first required stop

Outcome typically is very few additional deeper stops (say 3 typically in 60 meter profiles) and shallower than most of the other methods

WKPP Style Deep Stops are based upon the cave exploration Woodville Karst Plain Project (WKPP) practices of ratio decompression where the 1st deep stop is at 80% of the deepest ambient pressure, using an accent rate of 30 seconds/ 3m (20ft/6m per min). Then add 15 or 30 second pauses at each level."

So basically using accent rate and stop times to give an overall accent rate of 3m / minute with the first deep stop quite deep and then stops

every 3 meters till you get to the conventional decompression stop (example 50m exerts a pressure of 6 bar absolute 80% is 4.8 bar absolute or 38 meters is the 1st deep stop and then a stop every 3 meters for 1 minute

M Value / Gradient Factor GF (conservatism) adjustments. The “M” in M-value stands for “Maximum” for a given ambient pressure, an M-value is defined as the maximum value of inert gas pressure (absolute) that a hypothetical “tissue” compartment can “tolerate” without presenting overt symptoms of decompression sickness (DCS). M-values are representative limits for the tolerated gradient between inert gas pressure and ambient pressure in each compartment. The gas loadings for various half-time compartments will cross into and then out of the decompression zone during the decompression profile depending upon which compartment is “leading” or “controlling” at the time. Generally, the faster compartments will cross into the decompression zone first and be leading (gas loadings closest to M-value lines) and then the rest of the decompression profile will be controlled by the slower compartments in sequence.

These M Values can be adjusted by applying a percentage as of how far a decompression profile has entered into the decompression zone. A 0% M-value is at the ambient pressure line and represents the hypothetical “tissue” compartment being at the same pressure as the ambient pressure (depth thus no decompression of that tissue compartment) A 100% M-value is the pure decompression model.

These M Values can be used to create Deep Stops based upon applying large conservatism factors on the faster hypothetical “tissue” compartments (typically 15% for fast tissues and 85% for slow tissues this is essentially de-rating the “tissue” compartments)

Deep Stops utilising combined models This style usually utilises a Bubble model modified with the longer shallow stops controlled by a conventional Haldane based Bühlmann models. Bubble models are currently reasonable for bubble prediction although (generalisation) lacking in the longer controlling tissues. The most well known bubble models are the Reduced Gradient Bubble Model (RGBM) or Variable Permeability Model VPM (V Planner) or Copernicus for predicting both dissolved and free gas in the

tissues and blood of divers. The RGBM is based on both laboratory experiments and diving data, including data from DAN. The RGBM model is a significant advance on the classical Haldane models, which do not predict harmful free gas (micro-bubbles)

## Dive Computers and Safety Stops

This is a broad area with many styles of computers each with many differing base algorithms built into them many. Assuming the case where only the base decompression model without any conservatism or safety factors that may be applied either in the original programming of the computer or by a factor the operator programs in only dive computers for this discussion.

Given the above the dive computer tells the operator the current (for that algorithm) point drawn in the sand of the grey blurry fizzy line of no DCS Vs a DCS hit. In doing any additional stops the computer keeps calculating so adding a few stops may decrease some micro or silent bubbles but unless you add extra time to all of the stops your total ascent time is still just coasting along the grey blurry fizzy line. The case being if you are adding extra time or stop (unless it a factor programmed into the computer) you need to do it consistently to all of the stops and particularly the last stop

## So what are the current recommendations?

Safety Stop Recommendations All of the training agencies advocate precautionary safety stops for recreational divers, even when diving well within the no decompression recreational limits. Until recently, the various training agencies all had a similar set of minimum standards for the times and depths for these safety stops - at least three minutes at 3 to 5 metres. However, now some training agencies are taking into account recent research and changing their recommendations to

At least 1 minute at half of the maximum dive depth.

At least 2 minutes at 5 to 6 metres.



Note that the shallower stop is now recommended to be 5 to 6 metres, not the more common 3 to 5 metres as it had been in the past.

Deep Stop Recommendations are a bit of an each way bet but in several studies it has been shown that on long/shallow dive achieved a significant decrease of vascular bubbles following the procedure with deeper initial stops (a combined bubble Copernicus schedule) compared to the Bühlmann model. However, on the deep/short (65m for 20 min) dive the procedure with deeper stops gave a dramatic increase of bubble formation, after a revision with the deepest stops removed, (Mid Level Stops ??) gave a significant decrease of vascular bubble formation

What is interesting, and not necessarily intuitive but has been shown, is that an in-water stop with a relatively rapid ascent rate appears to be more effective at eliminating inert gas than a very slow constant ascent rate i.e., a five-minute in-water stop is much more effective than simply slowing the ascent rate equivalent to this, even though the total ascent time may not be much different. We know the spinal cord has a 12.5-minute halftime. Thus, 5 minutes is an insufficient total ascent time for the spinal cord which is, by then, virtually fully saturated (82% in just 25 minutes).

Even GUE who were arguably the main proponents of the deep stop, have altered their implementation of the deep stops and ascent speeds to reduce the time spent very deep (below 21m).

This leaves the current (still being debated) recommendation as Consider not doing overly deep stops but some stop before the 1st decompression stop may still be somewhat advisable



# South Pacific Divers Club - Photographic Heritage

## THE STORY OF THE GEORGE ROBERTS MEMORABLE UNDERWATER PHOTOGRAPHIC TROPHY

By Tom Byron - reprinted from Nov 1999 edition of the Wet Rag

At 1.30 on Monday, May 28, 1973, a dairy farmer on a property where a particular sink hole, The Shaft, is located, was notified by a distressed woman that four divers in their party had not surfaced from a dive. They were presumed lost and drowned. No one had died in The Shaft before May 1973, and there had been over 8000 dives before that date.

Among the four missing was scuba diver by the name of George Roberts a 28 years old toolmaker, and at the time a member of South Pacific Divers Club.

George Roberts first commenced diving in mid 1950 as a young competition spear fisherman with the then Kingfishers Spearfishing Club, he enjoyed moderate success as a competitor throughout the late 1950s and into the early 1960's, he also served as committee member for the club. However, George had another passion, that of underwater photography and as time passed he gave away spearfishing, joined South Pacific Divers Club in the mid 1960's and with the rest of the club members who were at that time all underwater photographers progressed with his hobby.

In those days it was extremely difficult to obtain off the shelf underwater camera housing so George with his knowledge as a toolmaker manufactured his own.

A friendly outgoing person George influence many new divers with his underwater photographic achievements. Throughout the latter part of the 60's many new club members became interested in taking photos underwater. George helped, encouraged, and suggested new ideas to further their interests and along with other members visited new dive locations as Bass Point, Jervis Bay, Coffs Harbour, Wollongong and then known dives sites around Sydney, to further their photographic skills.

As years passed by through the late 60's into the early 70's George improved his ability as a diver and photographer specialising in 6x6 format rather than 35 mm format. This led to larger housings and flash units that he made in his backyard workshop. Many members sought George's expertise to help them design and manufacture housings to suit their various cameras.

Always a person who enjoyed adventurous diving, in May 1973 George with eight other from South Pacific Divers Club set off to explore and photograph The Shaft sink hole at Mt Gambier in South Australia.



Image by Michael Cufer.

Scuba divers from all over the world had enjoyed its shadowed depth, and the spectacular rainbow coloured beam of sunlight that penetrates the dark subterranean water from a Small round hole at the surface of the paddock above.

On the day of the dive, all except one descended into The Shaft hole. George Roberts went down the shot line that terminated at the top of a rock pile in 33 metres of water then he started to swim slowly around the rocks, gradually descending to 60 metres below surface level. At this point the group could see one another and everything appeared in order, according to survivors. After five minutes some divers in the group decided to return to the surface whilst the rest descended further, George Roberts was among those that continued deeper. Within a couple of minutes and out of sight of the light that shone through The Shaft hole, total darkness descended upon the group. At this point there is no reference of direction and perhaps suffering from narcosis, lost their way. George Roberts's body was located ten months later on March 12, 1974.

A short time later as a mark of respect to George, South Pacific Divers Club decided to hold an annual underwater photographic competition between club members only, to try and improve the ability of upcoming underwater photographers, as George did when he was alive.



# 2009 George Roberts Memorial Photographic Competition



Image by Damien Siviero

As the competition was handicapped, any consistent underwater photographer had an excellent chance of winning.

Remember, the aim of this competition is to upgrade the standard of photography by encouraging the novice photographer and by making the established photographer strive harder.

## COMPETITION RULES

1. The competition will be conducted over three months.
2. Each month's competition will close at 10.00 p.m. on the night of the Club meeting for that month:

1\_\_FEBRUARY 2009    2\_\_MARCH 2009    3\_\_APRIL 2009

Late entries will be entered into the following month's competition.

3. The competition is open only to members of South Pacific Divers Club who are currently financial.
4. February Competition is open only to those people who have not gained 1st, 2nd or 3rd in any competition with the exception of past George Roberts Novice Sections.

March Competition is open to any person except those people who have won 1st, 2nd or 3rd open in past S.P.D. Competitions. April Competition is open to all members.

5. Each entry may be up to five slides per month. They will be judged and only the highest scoring slide counted.
6. There will be a prize-winner each month and a major overall prize-winner.
7. The winner and entrants each month will receive a score for the place they achieve (different from their slide score). This score is cumulative through the competition. The highest cumulative score at the end of the competition will be declared the overall winner.



Image by Dave Chillar

Overall the scores were very close and consistency was the winning formula to the overall winners.

In the final round there were some truly outstanding images that scored very very highly. It is clear that the club membership consists of some truly talented artists and others that have the potential to be talented. It is clear that in the open section we at SPDC have “world class talent”. It is also impressive that members were prepared to enter solely for the satisfaction of being part of the ongoing memory to a SPDC member that died so many years ago.

There were some entrants that did not enter in the last month who will wish they hadn't forgotten the deadline as a round with zero points cut them down at the knees in the overall pointscore.

And the winners are:

**2009 George Roberts Memorial Photographic Open Aggregate Winner**

**Damien Siviero**

**2009 George Roberts Memorial Photographic Open Highest Scoring Image**

**Damien Siviero**

**2009 George Roberts Memorial Photographic Novice Aggregate Winner**

**Joan Harper**

**2009 George Roberts Memorial Photographic Open Highest Scoring Image**

**Todd Murdock**



**CONGRATULATIONS TO THE WINNERS  
AND THANKS TO ALL WHO ENTERED**



Damien Siviero



Damien Siviero





Damien Siviero



Damien Siviero



Peter Harper





This page: Joan Harper





Peter Harper



Five images  
by Todd Murdoch

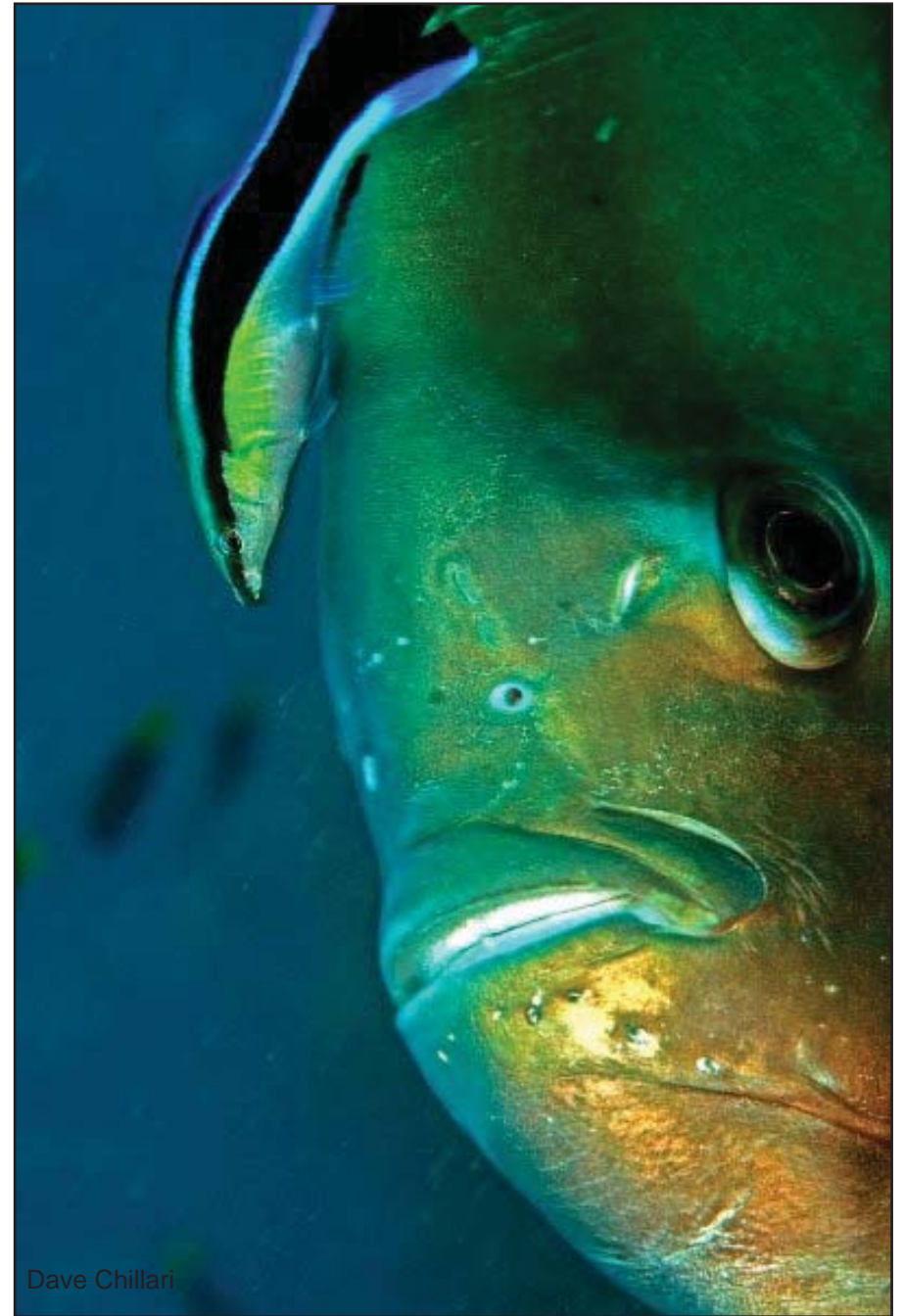


Peter Harper





Neil Vincent



Dave Chillari





Above and left: Theo Starr



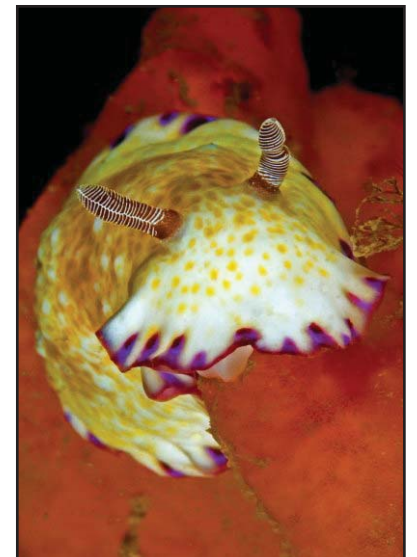
Below and left: Jason Farlow



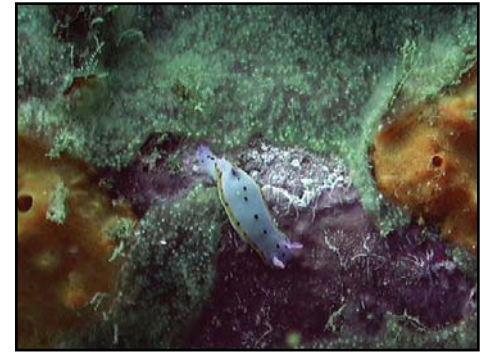
Leeroy Ford



Right: Dave Chillari







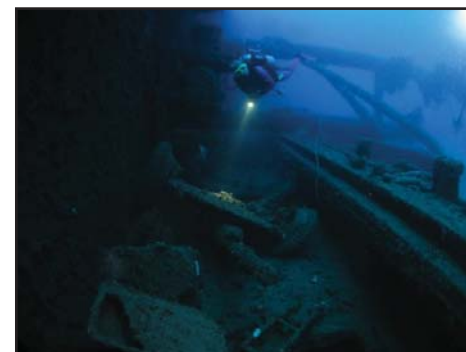
This page: Rob Creaser





This page: Robert Doust





This page: Simon Gaylor





Neil Vincent

Right: Joan Harper



Right: Simon Gaylor



Below : Jason Farlow



Below: Bob Tomlinson



Below: Peter Harper



## SPDC MEMBER PROFILE

# Jason Farlow



### ***What's your nickname?***

Jay or Jas

### ***How long have you been a club member?***

2 years

### ***What sort of diving do you enjoy most?***

All types, rock hopping, boat, wreck and anything with sharks.

### ***What is the most common misconception that people have about you?***

I don't know, I don't spend my time worrying about people's misconceptions about me.

### ***What kind of music are you into?***

Depends on what mood I'm in. I love the 80's "big hair" metal, but as far as newer stuff goes I like Linkin Park, Kings of Leon and Eskimo Joe - I have also been known to listen to Pink

### ***Any phobias?*** Spiders

### ***What temptations are you powerless to resist?***

Maltesers and kicking a football "kick it to me - kick it to me!!"

### ***What do you like to do in your spare time when you're not diving?***

My spare time is used to plan my next dive, other than that, I exercise at the gym daily, like to take photos and spend too much time on the internet.

### ***What's your favorite dive site and why?***

I love doing the midnight dive on the TSS Currajong in Sydney Harbour and the Tuggerah

### ***What's your most treasured piece of dive equipment?***

My camera

### ***What's the most annoying thing someone could do to you on a dive?***

I have a list, but the most annoying is someone silt up the bottom and ruin my photos, and people grabbing and poking at the wildlife.

### ***If you could go anywhere on the planet to dive where would you go and why?***

I'd like to dive at Midway Atoll and Palau.

### ***If you could have a 'celebrity' dive buddy who would you choose?***

Jessica Alba







ESTABLISHED  
1962

# Join the Club. Membership Application Form

Complete this form and post to: **South Pacific Divers Club, P.O. Box 823 Bankstown NSW 2200**

## APPLICATION FOR MEMBERSHIP

☐ I wish to apply for 1 year's membership.

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

Post Code: \_\_\_\_\_

Phone: \_\_\_\_\_

Work: \_\_\_\_\_ Home: \_\_\_\_\_

Mobile: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Diving Certification: \_\_\_\_\_

Certification Number: \_\_\_\_\_

Are You a Boat Owner: ☐ yes ☐ No  
If yes, type of boat: \_\_\_\_\_

Join now and membership lasts until end financial year 2008

### CURRENT MEMBERSHIP FEES:

Single \$50.00      Family \$75.00

*Please Note that Membership for 2006-07 has been increased to cover Insurance*

## DIVING MEMBERSHIP APPLICATION

I/We

hereby apply to join South Pacific Divers Club Inc. I/We understand the

Club is non-profit, non-affiliated with any training organisation and is for certified divers. South Pacific Divers Club Inc does not offer instruction, advice or supervise its members' divers. It is a condition of Club membership that members exercise their own judgement in accordance with their training in deciding whether and/or how to participate in any particular dive, the technique used, or choice of equipment and that any clarification in regard to these matters should be referred to a qualified instructor or my/our certifying agency.

**I/We have read the above conditions and accept same as a condition of membership.**

Signed \_\_\_\_\_

DATE \_\_\_\_\_