Christmas Gifts & Holiday Shopping for Divers

X-ray mag

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Solomon Islands

Medical
Diving with Diabetes

Portfolio
David Pilosof

Deep Diving Do It Right

Ecology
Stingrays

Travel Tips
For Mermaids Going it Alone

AWESOME
Australia
TIGER SHARKS BYRON BAY BONDI BEACH
NINGALOO REEF TASMANIA KENT GROUP

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COVER PHOTO BY PETER PINNOCK

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COVER PHOTO
Diver with Big Eye Jacks, by Peter Pinnock

(CONTINUED ON PAGE 4)

'Tis the Season to Give Gifts:
Holiday Shopping for Divers... See page 75

14K GOLD SEA TURTLE PENDANT DESIGNED BY EVAN LLOYD
PRICED AT US$281.25 **WWW.LLOYDSLIMITED.COM**

Manta Ray. Photos by Wags & Kelly

contents

Running Out of Fish Are We Now?

There are "**Only 50 years left' for sea fish**", "**UN considers deep sea trawling ban**", "**Seafood stocks are under siege, scientists say**" and "**Collapse of All Wild Fisheries Predicted in 45 Years**".

Well, these were some random pickings from another bunch of joyful headlines from the past month or so. Almost makes you want to cancel the paper, no?

Of course most of the press corps goes right over the top as usual blowing things totally out of proportion losing track of both facts and common sense. Then, just as predictable, in a knee-jerk reaction, some short-sighted fishermen tries to rubbish the scientists' findings right away in a desperate attempt to protect their livelihoods, as if it were the scientists who had invented the depletion of fish stocks. And so, the pendulum swings and debate goes on in the same predictable grooves with little real action taken.

"Impact of Fishing on Species Found to be Unpredictable"

The longstanding debate on the impact of fishing on the variability of fishing stock in the world's oceans then just got a tad bit more complicated as research published in ***Nature*** this past October pointed out that the impact of fishing on the populations of fish varies too much to be predictable. That led the researchers to conclude that its impossible to predict whether specific fish populations will collapse or rebound.

These findings which imply thatfishing can contribute to a boom or bust swing in the supplies of the targeted fish stock surprised some scientists, who alledgedly thought that fishing just caused predictable depletion. But it turned out that sometimes it can cause an increase. That makes predicting the amount of fish stock hard and can lead to the collapse of fishing stocks when a bust follows a boom.

The bottom line is, quite simply, that we don't need complicated science to tell us that the way we effect, interact with and depend on the global ecosystem will be sending the whole planet and humanity down the tubes, if we don't change course dramatically and soon.

Do'h!

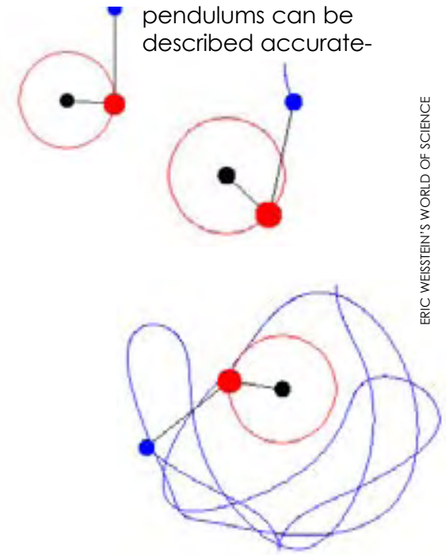
I don't know where the surprise comes in, and which serious researchers were actually surprised. I was dumbfounded. There is nothing new or mysterious in these'news'.

You see, in my other previous life, I used to be a researcher myself working with ecological modelling, and my special area of interest was looking into the progression of ecosystems over time and defining the limits of ecosystems' structural integrity and which changes are likely if these limits were overstepped, i.e. by external disturbances. In other words, if we compare an ecosystem to a building, how much perturbation and shaking can it take before it comes tumbling down in ruins and becomes something else?

Put simply

Now, to make a very long-winded and technical explanation very short, suffice it to say that once systems get a just a teeny-weeny bit complex, their future behaviour can't be predicted accurately. You have to resort to modellin—for example in computers—where you simulate possible outcomes.

Just consider a simple pendulum. The motion of this can be very accurately calculated. It was even used in clocks once, right? But suspend one pendulum beneath another and the whole system—even as simple as this and even if the motion of the individual pendulums can be described accurate-



ERIC WEISSTEIN'S WORLD OF SCIENCE

Click here to see it in motion

ly—soon exhibits chaotic behaviour.

Ecosystems are also systems of interlinked subsystems, but way more complex, in what is popularly called the food web.

Can we, from looking at the components, predict where it is all going? No!

The unpredictability of complex systems was already established in the 1930's, so where does the surprise come in again?

Can we, from the whole ecosystem's apparent behaviour and trend and inferences from past experiences and examples, make any reasonable guess-timates as to where we are heading? Did we learn anything from almost wiping out the North American bison, the pacific salmon, the rhino, the tiger? Hopefully, yes!

A final note

The bottom line is, quite simply, that we don't need complicated science to tell us that the way we effect, interact with and depend on the global ecosystem will be sending the whole planet and humanity down the tubes, if we don't change course dramatically and soon.

We just need to open our eyes. The fishes are all gone in some places, and steadily declining elsewhere. The progression of this development doesn't take a scientist to figure out (says this undersigned scientist).

You can start by shopping responsibly next time you go to the supermarket! ■


KURT AMSLER / SOS SEATURTLES

Support SOS-SeaTurtles

Sign the petition online, click here ☼

Thousands of sea turtles are being slaughtered often suffering an ugly painful death by being skinned alive. Click here to send an email with a "Letter of Protest" to the Governor of Bali and copies sent to other important officials

Click here to visit SOS Sea Turtle's webpage ☼

Want to know why? Turn to page 68 and read on

The "Awesome Australia" travel section in this issue was brought to you thanks to our associates from underwater.com.au:

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This issue of X-RAY MAG and others includes news and press releases from NAUI in sections designated by the NAUI logo. While the page design is done by X-RAY MAG as an integrated part of the magazine, these news stories are brought to you by NAUI at NAUI's discretion.

X-ray mag

News edited by Peter Symes

Seen at DEMA 2006

NEWS & Equipment

JASON HELLER

Ran Vered, David Doubilet, and Howard Rosenstein from Fantasea

JASON HELLER

Wayne Hasson, from the Aggressor Fleet, organized busloads of 200 high school students to tour the show floor and learn about careers in diving

DEMA SHOW

POINT & CLICK ON BOLD LINKS

Impressions from the 30th DEMA

Orlando, November 8-11

PETER SYMES

Uh-oh. Time for the annual DEMA report again. Like tax returns, it routinely catches me a bit off-guard that it's already that time of year again. I always struggle a bit with either one as I have to put all my creativity into one report but none whatsoever into the other—but here we go...

By Peter Symes
With additional reporting and photography by
Millis Keegan
Jason Heller
and Eric Cheng

For dive industry professionals worldwide, DEMA is one of the major annual highlights of the year. As is the case with Christmas, anticipation tends to start early nurturing ongoing speculation about what surprises will be unveiled this year by the secretive manufacturers. For the uninitiated, the DEMA show is the biggest and most significant dive trade show on the planet, but it is also a trade show with admission for dive industry professionals only—it is off limits for the general public. In a convention hall that looks like the size of Boeing's 747 assembly building, over 600 exhibitors from all over the world have erected what seems to be a small town of booths and displays big enough to warrant its own tram line.

Along the seemingly endless rows of long isles of booths, pavilions and exhibitions, we find a diverse mixture of established equipment brands—such as Suunto,Mares, Aqualung and many others—blended with a sound undergrowth of sprouting enterprises all vying for the interest of the prospective buyers, some of which actually brought some fresh thinking to the table. On the floor, we also find resorts and dive operators from all continents offering their wares interspersed with training agencies, publishers, environmental organizations, treasure hunters, dive magazines, apparel and jewellery and every imaginable flavour

PETER SYMES

Silly or Great?

We used to be on the lookout for the craziest or most silly invention at the DEMA show, such as the twin tube snorkel or the snorkel with built-in FM-radio. This year, however, we are not quite sure whether the Amphibian fin by brothers Abraham and Ronen qualifies or it is a stroke of genius in disguise. We are all quite familiar with the problematic issue of walking around in fins, right? In this original fin design, the blades pivot up thanks to hinges placed on both sides of the foot. Since the fin is already in two pieces, OmegaAquatics plans to add more features like interchangeable blades in the coming year. Currently available in colors of blue, yellow, green and grey. **www.omegaaquatics.com**

Ear dryer

The Sahara DryEar ear dryer circulates safe, gentle, warm air inside the ear canal and evaporates the trapped water leaving the natural environment in the ear relatively unchanged. It's the first ever, totally natural way to dry your ears and at the same time minimize the number of infections due to the moist environment in the ears after a dive. **www.dryear.net**

DEMA SHOW

of ocean-related businesses.

So, how was this year's DEMA, the 30th of its kind? I have been to 13 of the past 15, and in these years, it has always been a dynamic marketplace—some years much more so than others. The past couple of years have been disturbingly quiet, with the show in Houston in 2004 being an outright lame show low point. The dive industry has been struggling since the turn of the millennium, and it has experienced a strong change in dive travel, which 9/11, SARS and the turmoil in the Middle East didn't exactly help. So, it was a pleasure to see that at this year's show, a lot of the 1990's dynamic energy was back. Most of the major manufacturers were back in the show, and there was once more some interesting news here and there, which will be presented in the following pages. But DEMA is much more than just displaying new inventions and travel destinations, it is also a buzzing meeting place where numerous seminars are held. ■

Some of our fellow digital media 'accomplices'. Wendy and Jason Heller of DivePhotoGuide (above) and (right) Eric Cheng of WetPixel and Willy Volk of Divester

A typical scene: Bartering on the show floor. Bob Evans, founder and of Force Fin, demonstrates his latest design

Now for saltwater

The new Submerge model is a fast u/w scooter that weighs under 50 pounds. With its single 20 cell pack it is supposed to run a minimum of 60 minutes up to 100 minutes. It has the same driveline/motor and construction as previous models, and comes with a three-year corrosion warranty. **www.silent-submersion.com**

Mares Alikai

Today, we are highly weight restricted when traveling by air, and Mares has taken that to heart when presenting this lightweight BC for women. It folds to a compact size, is comfortable and promises a great boyancy lift. A special feature to save the back, is the Trim Weight pockets, placed on the tank strap, holding up to 6kg/13lbs. Will women be attracted by the fact that Allikai means the "Queen of the Sea"? **www.mares.com**

DEMA SHOW

Liquivision

We were looking for something new in mask design, and I think we found it. The mask that you don't have to equalize, is that even possible? The Nirvana-2 says it is, the mask is filled with salty saline water, and the special lenses in the goggle is supposed to correct your vision. Because the goggle is filled with water, it can never fog or leak. It sounds to good to be true, and I can't wait to try a pair. **www.liquivision.ca**

Status

It's here. The regulator that monitors your use and tells you when it needs service. The Apeks Status compact first stage accomplishes that with a digital display. This could save you some money. The Status is compatible to EAN 40 and comes standard with an environmental dry kit suitable for cold water diving. Four medium pressure ports 3/8" UNF and one high pressure port 7/16" UNF. **www.apeks.co.uk**

Cobra2

The air integrated Suunto Cobra2 is a full-featured decompression dive computer. It monitors and displays pressure, tracks your rate of air consumption and continuously calculates your remaining air time. Two-gas switching Nitrox, Air, and Gauge modes, and an electronical compass with tilt sensor perfects this tool. **www.suunto.com**

Analox

It only takes a small concentration of Carbon Monoxide, breathed at pressure, to have an adverse effect on the human body. The Analox CO Clear™, with a fixed alarm, that continuously monitors for high levels of Carbon Monoxide contamination from compressors is a tool to help a filling station to deliver clean air. **www.analox.net**

MorFin

These fins created with hydrodynamic 'wing' shapes aspire to lift you forward in the water like a small airplane. They can be used with traditional strokes, but their strength shows when using the dolphin kick. **Mor-fin.com**

Wide screen

Designed to be easy-to-read, a large size display was one of the primary requirements. To optimize readability in every circumstance, special attention was also paid to the size and brightness of the numbers when designing this piece —so was maximizing the viewing angle of Nemo Wide. You have an easy four button access to the system and a nice ergonomic design for comfort.
www.mares.com

Aqualung i3

Next step in BC technology is the streamlined Sea Quest Pro QD with an integrated inflation and deflation system. The system has the diver controlling ascent and descent by pulling a lever up and down. The lever is fixed to the BC on the left lower side. Pull up, and air from the tank enters the BC; pull down, and ***both*** the upper and lower one-way air valve simultaneously releases air from the BC. This makes venting easier if you are in a head down position. For some old timers, this might take some time getting used to, but the nice streamlined design could make up for that. Another neat feature is the flat contour of the valves, they are now actually embedded in the vest rather than sitting on top of it.
www.aqualung.com

Swiss Video Lights

This small and powerfull video light gives a natural white light of daylight quality with a color temperature of 5200 Kelvin at 21 watts. It has eight settings ranging from 14 to 28 watts. The light includes a bracket that mounts easily on standard arm systems and to top that off, it ads only 0.27kg to your gear. Burn time is 100-180 minutes. Another good feature is the overtemperature protection that allows you to use the light also outside the water.
www.keldanlights.com

It's smaller than you think

And it will lead you through the dive with light. It really doesn't matter how good a dive computer is if you can't see the display when you are diving. The display of the Liquivision F1 - Technical Grade Bottom Timer really shows you big fonts on the display, bright and clear, with a 180 degree viewing angle. You can not miss your dive time and depth unless you close your eyes. **www.liquivision.ca**

Henderson

Perhaps Henderson's most highly advanced, patent pending material. The material called Insta Dry™ dries in just minutes. It is still warm, has anti-microbial properties and keeps the water shedding. The outer layer is made of durable, non-pilling Micro Mesh high carbon.
www.hendersonusa.com

Hot Down Under

It can get cold while diving even in Florida, but with the help of the "Heated Kidney Belt" you can keep warm under your suit. Put your kidney belt on, and when needed, a push on the right spot will release heat for up to an hour.
www.hotsuits.com.au

Ladies only

The first and only regulator dedicated to women, writes Mares in their new 2007 catalogue.It is elegant, it is lightweight and comes (except in the US) with a anatomically designed 'jAX mouth-piece' that can be custom moulded. The second stage is built over the Mares Proton. **www.mares.com**

Whites Catalyst

Unique above the shoulder to shoulder self entry system CSS – patented Captive Suspension System panels all around the waist and above the knees (360°!) and revolutionary pattern design allowing seven sizes to fit 90% of all human beings! **www.whitesdiving.com**

May the Force (Fin) be with you

Bob Evans once again releases a forceful fin, not like any other. As always, a futuristic design, colorful, like nothing before seen. The beauty of his new innovative models are that the blades are exchangeable. You keep the new comfortable footpocket and pick the fin blade that fits the dive you are about to do. **www.forcefin.com**

Vyper2

The Suunto Vyper2 includes Gauge and Nitrox modes as the predecessor, but with the added feature of gas switching. The Suunto Vyper2 can be programmed in one percent increments for nitrox mixtures between 21 and 100 percent oxygen. It is also possible to adjust oxygen partial pressure between 0.5 and 1.6 bar in 0.1-unit increments. Adjustments can be applied to both mixes. Wear it as a wrist unit with a protective boot, or mount it on a two-gauge console. **www.suunto.com**

Predator

This new edition of the Neptune Space mask is constructed with parts made of Ergal, a lightweight and durable aluminum compound used in aeronautics for applications requiring high mechanical resistance. These parts have a light gold finish which recalls the helmets of the first deep water divers. The mask design allows divers to make sensitive micro adjustments to the airflow, even when using gloves. Surface treatments protect the mask from salt water damage and tech-polymer protection treatments allow the PREDATOR to be used in extreme conditions. The total weight of the mask is 970 g with a positive buoyancy of just 296 g, creating a light and comfortable fit.
www.oceanreefgroup.com

TB130 Oxy booster

This is a single stage, single acting air-driven gas booster pump (also suitable for oxygen) All components are O_2 clean. Technical Information: Length 600 mm/23.62 in, width 200 mm/7.87 in, net weight 15 kg/35 pounds (without whips)
www.airetex.com

AquaSketch

This new gadget, meant to replace the u/w slates has a phosphorescent writing surface that illuminates during night dives. Use the included Graphite pencils to write on a 5-foot roll of blank Vellum and sketch little Nemo if your buddy is boring.
www.aquasketch.com

Arc Lenses

All Atomic Aquatics masks come standard with their special Ultra-Clear optical quality glass with exceptional clarity, light transmission, and no color distortion. ARC technology coatings further improve this already incredible lens material by reducing reflections and by allowing more light in the diving mask. Atomic Aquatics introduced Ultra-Clear to the diving industry and has never used low cost, poor quality green float glass like the other masks on the market. **www.atomicaquatics.com**

Side exhaust

The Aqualung Kronos regulator has a combined venturi and breathing-resistance knob to simplify adjustments and also sports a side exhaust system to warm the internal components and disperse bubbles—which especially photographers will know to value. **www.aqualung.com**

Weezle

Cold feet are a major complaint of divers. Weezle boots use the same innovative materials as used in their undersuits. Available in Compact and Extreme Weights. Instead of having an undersuit sock that finishes at the ankle, we have extended it up the leg to just below the knee. Ankle weight wearers will find that this also adds a layer of comfort not featured in other undersuits and long-legged people will aviod having a cold gap.
www.weezle.co.uk

Flip-up camera

With HERO you will at least always have your camera ...erh... handy. It simply sits flat on a neoprene wristband until you need it. Once needed, it pivots up in an upright position—where it stays secured—you aim, shoot and hey presto your holiday shots for auntie Agatha is in the box. Ant is not only for diving. Take it cycling, kayaking or climbing. Connects to your computer via a standard USB-cable. **www.goprocamera.com**

Aeris mask HUD

Not reallly the latest news as it was lauched by Oceanic mid 2006, but finally we got to try one on. Like a Porsche, this mask is sort of on the pricey side, but the finish is very nice and has a luxurious feel to it. The mask feels good and, most importantly, the HUD display is both clear and easily visible, yet not too imposing. Great for photographers and others who carry stuff around and need to stay focused. **www.diveaeris.com**

Nitelze LED Wand

15 hours is how long a tiny button battery will last you on this signal wand, or marker, from Nitelze. It is shock and waterproof with a depth rating of 1000ft / 300m. It also doubles as a handy pointer. **www.niteize.com**

H2Odyssea Regulator

The "Magnum" is H2Odyssea's third generation regulator. What struck me upon handling it at the show is how compact the first stage was and the exceptional finish. This forged brass first stage, with environmental sealing, screws into any size tank with ¾" thread. It is mostly used for redundant air systems but can also be used on rebreathers and argon systems.
(no website found)

Smoke on the Water

No, we are not referring to the classic rock song by Deep Purple but the upcoming look on Atomic Aquatics Splitfin. As an added standard feature, the elegant "Smoke on the Water" model comes with the new spring strap. These have a variable pitch and geometry that both allows for a more confortable fit and simple one-handed removal. Available in early 2007.
www.atomic-aquatics.com

Clever as Ever

If you feel that you need some help controlling your ascent rate and have an extra hundred dollars to spare, this handy little device might be exactly what you need. It clips on easily to your mask strap and gives off an alarm when you ascend too fast. It will also signal a safety decompression stop of 3 minutes at 15 feet of water. Will it help prevent diving death and diving-related injuries? It may or it may not, but it will most definitely make you aware of when you loose your concentration and begin an unwanted ascent. However, what if you let yourself slip a little deeper than you were supposed to? Well, then you are on your own. The product is called MARA, the Miniature Ascent Rate Alarm, and is invented by Master Underwater Technologies
www.masterunderwatertech.com

Whites Legend

This, their first compressed 2mm neoprene dry suit that incorporates the patented Captive Suspension System panels under the arms, waist and above the knees, allows the most difficult technical movements to be achieved effortlessly.
www.whitesdiving.com

2 in 1

Not exactly a new idea but modernized and sports a nice design. The OCTOS Gemini replaces the conventional BC power inflator and back-up second stage regulator by combining the functions of both in a single convenient unit. Eliminates the need for one hose from the first stage. Provides excellent breathing performance without the need for in-water adjustments. Power inflation, oral inflation and exhaust trim valve operations remain similar to the standard BC inflator and allow easy single-handed control.
www.sherwoodscuba.com

On Pure Oxygen

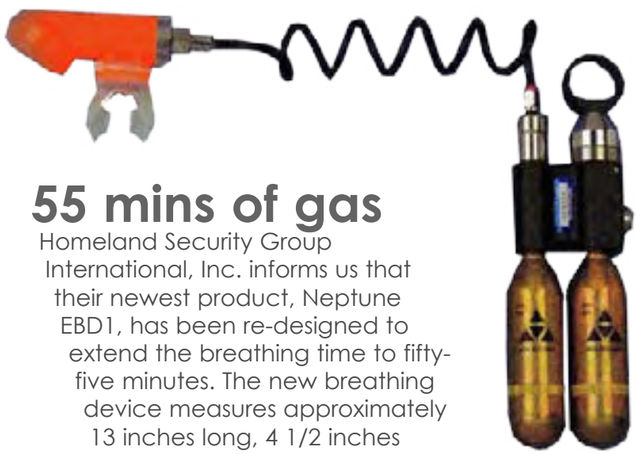
A Push-button type of valve injects the oxygen in the breathing bag from the Oxygen cylinder.
The gas is inhaled by the diver and the exhaled gas goes back inside the bag (one-way loop system).
More oxygen is manually added by the diver as he/she metabolizes.
The gas is scrubbed by the canister for Soda-lime (CO_2 filtration material).
WARNING: Oxygen Toxicity Rules stated by NOAA and the United States NAVY must be observed and followed closely by the trained operator in order to avoid injury.
www.divesafe.net

Getting Hooked

Let's face it, a certain fraction of humanity consists of knot-challenged members of our society. The Figure 9 rope tightener eliminates the frustration of tying, adjusting and untying knots
www.niteize.com

Getting Hooked Up

Tired of having your laptop running out of juice while you are on a long-haul flight? Enter this little gizmo which plugs into the passenger seat's audio jack and outputs regulated power to the attached USB charging cable/connector. Price:$34.99 **www.inflightpower.com**



55 mins of gas

Homeland Security Group International, Inc. informs us that their newest product, Neptune EBD1, has been re-designed to extend the breathing time to fifty-five minutes. The new breathing device measures approximately 13 inches long, 4 1/2 inches wide with a weight of just less than five pounds. The new version, which has not been officially named, will supply 55 to 60 minutes of positive, 2-stage regulated airflow depending on stress. **www.hsgint.com**

Wetsuit Bag

Who doesn't know the problem? Everyone tells you to be careful with your wetsuit, but no one shows you how to actually do that. iQ delivers a solution: the new Wetsuit Bag. With this bag the transport and storage of your wetsuit will be a piece of cake. With a special suspension feature, the folding of the wetsuit will be reduced. An open net on one side of the bag ensures ventilation, while the other side is closed so that a wet wetsuit will not drip during transport. An additional compartment provides enough space for neoprene accessories like boots, gloves or others. It's the best thing you can do for your second skin. **www.iq-company.com**

Taking the inlaws on a picnic?

The Discovery 1000 is a state-of-the-art submersible that offers panoramic viewing, contemporary styling, hydrodynamic efficiency and extraordinary range, endurance and maneuverability. Originally designed for launch and recovery from a superyacht, the Discovery 1000 is a modular design available in either two, four or six-passenger configuration all based on an identical external framework. A 40 KW diesel engine with hydrostatic drive can be added to each vehicle as an option to increase surface range and speed.
The Discovery design prioritizes the following characteristics:
* Minimum weight in air
* Exceptional viewing
* High level of comfort
* Low hydrodynamic drag
www.ussubs.com

news

Edited by Peter & Gunild Symes

Coral Transplants Rebuild Reefs Wrecked In Tsunami

New methods of transplanting coral grown to restore reefs off the coast of Thailand hurt by the 2004 tsunami have been developed by researchers assisted by

NOAA

British divers. The corals are grown in floating nurseries, netted cages that are suspended in the sea, which protect the coral from strong currents and grazing fish, increasing the coral's chances of survival.

At a small island near Koh Phai, the first crop was successfully transplanted onto severely damaged reefs. The method will be appled to reefs of Phi Phi and Phuket next.

In addition to the transplant method, researchers have also designed special concrete cylinders with lots of holes in them, which will serve as beds for coral larvae to grow, as part of an new kind of artificial reef. It has been found that the conventional concrete blocks and offshore marine wrecks did more harm than good in seas with strong currents and a lot of pollution or sediment.

Thai marine biologist who heads the project, Nalinee Thongtham, explained, "Some rehabilitation work in the past unwittingly destroyed the reefs, partly due to inadequate knowledge of coral biology."

Six other countries including Israel and the UK are collaborating on the project to help coral larvae have a better chance of survival after storms or other events cause coral debris to be strewn all over the seabed. SOURCE: SUNDAY TIMES ■

FAO

Tiny Fish Learn to Sniff Out Predators

Small fish, big sense of smell... That's what researchers have found in a new study conducted at the University of Saskatchewan in Canada and detailed in the journal Animal Behavior that suggests minnows can pick out the odor of a single predator.

The sophisticated sense of smell of minnows was discovered when scientists exposed the small fish to two different batches of water scented with pike, a major predator of minnows. One batch contained the scent of twelve pike fish, the other only two. The small fish reacted more strongly to the latter because the batch contained more "chemicals-per-pike", which suggests that the fish use smell to figure out how far away a single predator is by how concentrated its smell is.

A second experiment with the minnows found that the fish could also distinguish between individual pike. Apparently, the response is learned. The minnows learn to associate danger with the smell of a dead minnow and the smell of a predator. ■

Minnows use their sense of smell to survive

SOURCE: LIVESCIENCE

Discovered: The World's Second Smallest Fish

A scientist in Malaysia has discovered a very small fish that grows no larger than 10mm at maturity. Thought to be the second smallest fish in the world, the "Perak fish" as it is unofficially called is still undergoing investigation in order to identify its genus and species.

Dr Khoo Khay Huat of the University Sains Malaysa found the specimen in a peat swamp in Perak. Before he found the Perak fish, he discoverd a 1.2cm fish of the *Paedocypris Mecromegethes* species in Sungai Gayau, Mukah, Sarawak. The species name is derived from the Greek words that translates loosely to 'children, small in size'. Huat told reporters, "We call it a childlike fish. We also believe that the two fishes are from the same genus but from a different species."

The scientist will continue to study the small fish species in the peat swamps of Malaysia and other locations before the areas are destroyed to make way for oil palm plantations. SOURCE: UNDERWATERTIMES.COM NEWS SERVICE ■

NATIONAL PARK SERVICE

Crayfish faking sex not war

Researchers have found out that crayfish practice pseudo-sex in order to establish dominence without violence among males.

Pseudocopulation, as it is called by scientists, is used by mammals such as primates to establish hierarchies while easing aggression among males. This is the first time scientists have observed the behavior outside vertebrate animals. In many cases, it saves the lives of individuals who would most likely be killed by larger and stronger animals.

Neuroethologist Donald Edwards, who has been studying the phenomenon in Louisiana crayfish with colleagues at Georgia State University in Atlanta, told Live Science,"Universally, aggression or its threat is used to set up and maintain dominance rankings within a population of animals. Aggression, however, is dangerous for both dominant and subordinate, so many animals try to discover ways to avoid it." ■

Is It Okay to Eat Toothfish Again?

The Marine Stewardship Council in London has certified that a small Chilean sea bass (a.k.a. the endangered Patagonian Toothfish) fishery in South Georgia and South Sandwich Islands in the South Atlantic near Antarctica is selling sustainably caught sea bass. Now grocery chain stores such as eco-conscious Whole Foods in the U.S. are once again offering Chilean sea bass to their customers after a seven year hiatus. Critics of the move worry that customers will get the wrong idea, as the sea bass crisis is not quite over yet. Gerald Leape, the vice president for marine conservation at the National Environmental Trust in Washington told the New York Times News Service, "They may think that all Chilean sea bass are OK now, and that's not true," he said. "The certified fishery accounts for only 10 percent of the total catch. Chilean sea bass are still overfished and depleted." ■

FAO

Not Two, But One Genus for Clownfish

A recent indepth study suggests that clownfish belong to only one genus. The study published in the journal, Gene, provides evidence that shows all clownfish descend from a common ancestor. Scientists Santini and Polacco sequenced the cytochrome b gene, 16S ribosomal RNA gene and the first half of the D-loop, of 23 of the 28-32 of clownfish to rebuild a molecular phylogeny. They found that the molecular evidence for the monphyly of the *Amphiprioninae* pointed to a single genus for all members of the subfamily. This finding is at odds with the morphological taxonomy, which divides the subfamily into two genera: *Premnas* and *Amphiprion*. ■

SØREN REINKE

North Sea Cod Fishing Ban Urged

The International Council for the Exploration of the Sea (Ices) has recommended there should be a complete ban on cod fishing in the North Sea for 2007 and zero catch was needed for the next two years for North Sea stocks to reach target levels. Any catches that were taken in 2007 would prolong recovery to the target level, their report warned. It said that the stock had been reduced to a stage where productivity was impaired, and that it was at or near its lowest observed level ever. ■

BAE SYSTEMS

Unmanned Spy Planes May Patrol North Sea

Unmanned aircraft could soon be used to monitor illegal fishing activities in the North Sea, it has been revealed. BAE Systems are working on producing a special type of robotic aircraft similar in design to the planes now being used in the Middle East war zones, but without the weapons and specially designed for fishing surveillance use. A spokesman for BAE Systems said they were so sophisticated that they could pick out a lobster pot the size of a football from several thousand feet up. "They could also be used in the search for men lost overboard or for lost fishing boats," he added. ■

Impending Collapse of Fish Stocks Worldwide

All species of wild seafood that are currently fished are projected to collapse by the year 2050, according to a new four-year study by an international team of ecologists and economists. Collapse is defined as 90 percent depletion. The study published in the November 3rd issue of the journal Science.

The scientists warn that the loss of biodiversity is "profoundly" reducing the ocean's ability to produce seafood, resist diseases, filter pollutants and rebound from stresses such a overfishing and climate change.

"Whether we looked at tide pools or studies over the entire world's ocean, we saw the same picture emerging," says lead author Boris Worm of Dalhousie University. "In losing species we lose the productivity and stability of entire ecosystems. I was shocked and disturbed by how consistent these trends are—beyond anything we suspected." In 2003, he co-authored a study warning that 90 percent of all large fish—tuna, marlin, swordfish, sharks, cod and halibut—were gone.

The report also contains some positive aspects; The data indicate that ocean ecosystems still hold great ability to rebound. But the scientists found that every species lost causes a faster unravelling of the overall ecosystem. Conversely, every species recovered add to overall productivity and stability of the ecosystem and its ability to withstand stresses. "Every species matters," the scientists say.

"The data show us it's not too late," says Worm. "We can turn this around. But less than one percent of the global ocean is effectively protected right now."

"We won't see complete recovery in one year, but in many cases species come back more quickly than people anticipated—in three to five to ten years. And where this has been done, we see immediate economic benefits," Worm said.

UN rejected bottom trawling ban

A ban on bottom trawling in international waters failed to get United Nations' support as this issue went to press despite negotiations that lasted long into the nights. The decision has angered environmentalists worldwide, who blamed Iceland for blocking the ban. They said other countries, like Canada, have spoken out against a full ban but always showed a willingness to negotiate. "It's a tragedy that destructive practices are being allowed to continue today after days of talks by world leaders about high seas fishing reform," Bill Wareham of the Vancouver-based David Suzuki Foundation. SOURCES: ENVIROMENTAL NEWS NETWORK, CBC NEWS, BBC ■

The analysis is the first to examine all existing data on ocean species and ecosystems, synthesizing historical, experimental, fisheries and observational datasets to understand the importance of biodiversity at the global scale.

The results reveal that progressive biodiversity loss not only impairs the ability of oceans to feed a growing human population, but also sabotages the stability of marine environments and their ability to recover from stresses. ■

"Unless we fundamentally change the way we manage all the oceans species together, as working ecosystems, then this century is the last century of wild seafood"

Steve Palumbi
Stanford University

Japan agrees to cut its tuna fishing quotas

Life just got a bit better for embattled southern bluefin tuna in the oceans around south-east Asia, New Scientist reports.

After Japan's admission that it had overfished the species by 1800 tonnes in 2005, the country's Fisheries Agency has agreed to halve its existing quota of 6065 tonnes to 3000 tonnes for at least five years, starting in 2007.

Conservationists welcomed the news, which was announced on 16 October in Miyazaki, Japan, following a summit held by the Commission for the Conservation of Southern Bluefin Tuna. But they are still concerned that the proposed cuts are not enough. WWF says that Australia's quota of 5265 tonnes should have been cut too. Virtually all of it ends up imported by Japan.

Overall, the summit nations agreed to a 20 percent cut in the bluefin harvest, down to 11,530 tonnes from the 14,000 taken this year. Japan and Australia account for 80 per cent of the total catch.

Bluefin tuna are also declining in the Mediterranean, where France exceeded its 6192-tonne quota in 2005 by 3000 tonnes. ■

NOAA

Philippines President Moves to Protect "Coral Triangle"

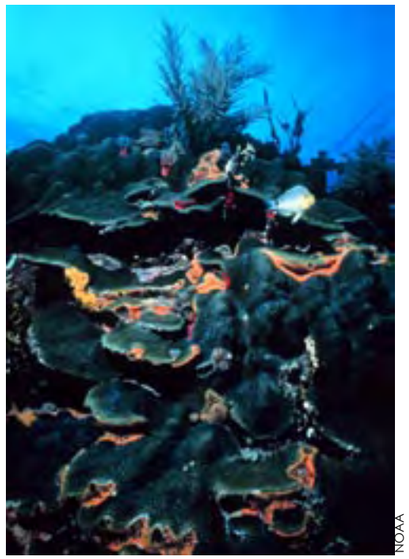
President Gloria Arroyo has enacted a new national conservation policy for the Philippines to protect the archipelagic country's unique and rich nature, with initial focus on the heart of Southeast Asia's Coral Triangle.

"It is the policy of the state to protect, conserve and sustainably use biological diversity to ensure and secure the well-being of present and future generations of Filipinos," said an Executive Order signed by Arroyo at a Nov. 8 ceremony on Verde Island in Batangas City.

The order applies to all of the natural wealth of the Philippines, and specifies initial steps to create marine protected areas in the Verde Passage, known as the "center of the center" of the world's most plentiful shore fish region located at the apex of the Coral Triangle that includes the Philippines, Malaysia, Indonesia and Papua New Guinea.

SOURCE: CONSERVATION INTERNATIONAL ■

Structure of Coral Reef Ecosystems Are Changing



NOAA

Boulder star coral

Large species of coral that form underwater reefs and create rich habitat for marine life are disappearing from in the Caribbean warn scientists.

Abnormally warm weather, coupled with pollution and overfishing have contributed to a change in coral reef ecosystem structure where larger species are being replaced by smaller varieties, which don't grow high enough to protect the fish, lobster and other sea life that rely on the underwater reefs.

Species such as the boulder star coral, which stretch several yards across, take hundreds of years to grow. In Jamaica, the species has almost been replaced by mustard hill coral, a smaller species unable to make large reefs and around the US Virgin Islands it could be gone in the matter of few decades.

"The big guys are becoming rarer. The small guys are becoming more common," said Edmunds, Peter Edmunds, a biology professor at California State University, who recently began projects near Tahiti and Taiwan, where he plans to compare data with that gathered in the U.S. Caribbean.

U.S. GEOLOGICAL SURVEY

A bleached elkhorn coral near St. Croix, U.S. Virgin Islands in 2006. Scientists have issued their strongest warning so far this year that unusually warm Caribbean Sea temperatures threaten coral reefs that suffered widespread damage last year in record-setting heat

Mark Eakin, director of the U.S. National Oceanic and Atmospheric Administration's Coral Reef Watch, said the coral study documents an even more widespread phenomenon. "That's a general pattern we have seen in other places as well," Eakin said, referring to the Caribbean. "The remaining large coral, such as star coral, is dropping away" and the smaller coral is moving in.

A vital building block of marine life, coral grows and reproduce best at about 27.5° C (81.5 F) the Caribbean, said Edmunds, who has studied Virgin Islands coral for two decades. Edmunds said his research suggests coral in warmer water grows more slowly.

The U.S. government scientists also warned for a second time this year that sea temperatures around Puerto Rico have exceeded healthy levels for coral, saying the fragile undersea life could become more susceptible to damage and disease during overheating.

Don't touch!

The government warning urges scuba-dive operators and underwater researchers in the U.S. Caribbean territories to look for coral damage and use caution around the fragile reefs, which are easily damaged by physical contact. ■

Transatlantic Ocean Array Acts as Climate Alert

Measurements from a network of monitors stretching across the Atlantic Ocean could offer an early warning of "sudden climate change". The underwater instruments measuring the temperature and salinity of seawater will detect any change to currents that regulate Europe's climate, a UK-led team of researchers tells BBC.

The data offered is the most detailed picture of the ocean's circulation patterns. The array of 19 "moorings" is positioned at points 26.5 degrees north in the Atlantic Ocean, providing an insight to the Meridional Overturning Circulation (MOC) that acts as the Earth's "heat pump", distributing heat via the ocean from the equator to northern regions. SOURCE: BBC ■

Read more about the circulation patterns in this previous X-Ray Mag article: **The Conveyor Belt** (from issue 11)

Human Activities Are Boosting Hurricanes

Rising ocean temperatures in key hurricane breeding grounds of the Atlantic and Pacific oceans are due primarily to human-caused increases in greenhouse gas concentrations, according to a study published online in the September 11 issue of the Proceedings of the National Academy of Sciences.

Using 22 different computer models of the climate system atmospheric scientists have shown that the warming sea surface temperatures (SSTs) of the tropical Atlantic and Pacific oceans over the last century is linked to human activities.

Hurricanes are complex phenomena that are influenced by a variety of physical factors, such as SSTs, wind shear, water vapour, and atmospheric stability. But the important conclusion is that the observed SST increases in these hurricane breeding grounds cannot be explained by natural processes alone. The best explanation for these changes has to include a large human influence," the scientists wrote.

SOURCE: LAWRENCE LIVERMORE PUBLIC AFFAIRS ■

news

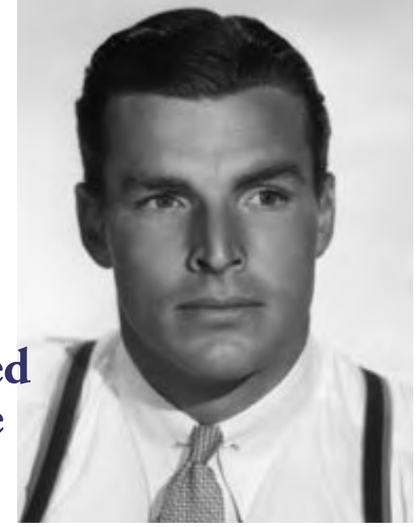
Edited by
Willy Volk

Details On Vanished 'Spy' Diver Emerge

Quite unlike James Bond, not all spy divers ascend perfectly coiffed and ready for their next assignment. In 1956, for example, British spy diver Lionel "Buster" Crabb vanished mysteriously while diving near—and allegedly spying on—the *Ordzhonikidze* in Portsmouth Harbour. At the time, the Soviet ship was carrying Nikita Khrushchev who was in London meeting with senior British officials. Crabb disappeared that night; several months later his headless corpse was found floating along the coast.

Speculations

According to papers recently released by the National Archives, an unnamed, unidentified officer ferried Crabb to the *Ordzhonikidze* and stayed onboard as Crabb dived below the surface. Not surprisingly, news of the the alleged spying incident wrecked attempts at a truce between Britain and Moscow, which indignantly insisted it was being spied upon. In an effort to distance itself from the mess, the Royal Navy engaged in a hasty public relations campaign, insisting it had nothing to do with the "mishap" and releasing a statement from the unnamed officer stating that he had been asked to assist Crabb "entirely unofficially and in a strictly private capacity."



Lionel "Buster" Crabb, a spy diver whose headless body was found floating off the coast months after he disappeared during a mission

So who hired Crabb?

If the Royal Navy knows, it isn't saying. In fact, those recently released documents state that the unnamed officer "knows nothing of the background to the story and will not be able to answer any embarrassing questions even if they are asked." Nevertheless, Howard Davies of the National Archives said the extent of the cover-up suggests something fishy is going on, and that Crabb's intelligence service handlers did not take proper precautions to protect him or the secrecy of the mission. Until more details emerge—if they ever do—Crabb's family and historians will have to wonder who beheaded the British spy. SOURCE: BBC ■

Free diver Hannah Stacey a mermaid

It's been more than 20 years since "Splash" made waves in movie theaters. If you've been waiting for another mermaid-out-of-water story since then, then your long wait is nearly over. Free diver Hannah Stacey has recently finished three weeks of shooting for her role in "Fish Tales," a film about a mermaid who falls in love with a university professor. Hannah, who currently holds the UK's free diving woman's record (54 meters), said the role was a dream come true. Although it took costume designers three-and-a-half months to build her tail, director Alki David said Hannah found her groove immediately: "She's amazing in the tail, she's like a natural. As soon as she put it on, she just took off. She knew exactly what to do and we couldn't stop her." The film, which also stars Kelly Brook and Billy Zane, is expected to be released next summer. Can you say "Eeeeieiiiieieeeeeeieie"?

SOURCE: BBC ■

Hannah Stacey
UK Freediving
champion

UK FREEDIVING ASSOCIATION

PHOTO COURTESY OF PURE BLUE WATER

Hannah Stacey, UK champion free diver does her mermaid thing

news

Edited by
Willy Volk

FILEPHOTO/WIKIPEDIA

Fishing Trawler Nets Unusual By-Catch

Fishing trawlers are well-known for destroying marine ecosystems and decimating local fish populations. Consequently, even if you didn't needed another reason to detest trawlers, here's one more: a man diving off the coast of Portland, on the UK's Dorset coast, was recently hauled up in the net of a trawler, the Shiraz. Due to the diver's quick, unscheduled ascent, he immediately started to suffer from the bends. A coast guard helicopter was summoned to the Shiraz, which delivered the diver to a specialist recompression chamber, where he was treated and later discharged. It's unclear if the diver was using a diving buoy while underwater. As such, the Coast Guard is investigating the incident. SOURCE: BBC ■

Cave Diving Expert Rick Stanton to Speak at Oztek'07

If you're not familiar with cave diving, you might be surprised to know that the discipline actually has two distinct styles. Some cave divers choose to dive through flooded caves and rarely leave the water. Other cavers treat flooded sections simply as obstacles to finding a dry portion of cave, where they can celebrate with cheese and crackers. Not content with mastering just one of these styles, British technical diver Rick Stanton is a recognized expert in both disciplines. Concentrating on the long deep siphons of France, Spain, and Italy, Stanton is known for combining caving techniques with long and deep multiple sump systems, transporting large amounts of diving equipment through the dry sections of the cave, all in name of exploration. In the last 8 years, Stanton has become increasingly interested in technical cave diving using rebreathers -- often two at a time! In 2004, Stanton was one of two divers tapped by the British government to attempt the rescue of six British soldiers trapped in a Mexican cave by flood water. Over the years, Stanton has developed and manufactured two CCR units, including a unique side mount, fully-closed circuit rebreather, which was instrumental in his achieving the British cave diving depth record of 90 meters at Wookey Hole. If you're interested in hearing about his exciting—and often dangerous—exploits, you should plan to attend the OZTeK'07 Diving Technologies Conference and Exhibition, scheduled for March 17 and 18, 2007, Sydney, Australia. In his presentation, Stanton will no doubt thrill audiences by sharing stories about how righteously cool he is.

SOURCE: FINSONLINE ■

DIVEOZTEK.COM

Rick Stanton

Think your library of underwater images has everything? I bet you don't have a shot of this...

In his charity exhibition "Quiet," photographer Michael Muller claimed he wanted to portray the enveloping stillness and silence one experiences underwater. To achieve this goal, Miller showcased images of objects and people submerged in water. No surprise there. However, one of Muller's images—"The Sinking Fear"—might surprise you. It features actress/model Eva Mendez in a couture gown swimming in front of a $63,000 (including options) 2007 Mercedes GL450 suspended in a giant tank. Although submerging a 5,249-pound vehicle might sound simple, Muller insists it wasn't. "After rigging up the GL450 to the crane, we dropped it in the tank and I jumped in with my gear to start shooting," said Muller, a certified diver. Surprisingly, the GL450 floated initially; Muller claims he was forced to clamber onto the roof of the SUV to facilitate its sinking. Hmm....usually, when you think of a $63,000 vehicle in water, you imagine people hauling it UP from depth.

SOURCE: MSNBC.COM ■

PHOTO COURTESY OF MERCEDES BENZ

File photo:
Jean-Michel
Cousteau in
Antibes 2005

YANN SAINT-YVES

Jean-Michel Cousteau Bashes the Late Steve Irwin

In the last issue of X-Ray, we mentioned the death of "The Crocodile Hunter," Steve Irwin. Since then, world-famous marine explorer/environmentalist Jean-Michel Cousteau has revealed that, while he believes Irwin's death was "very, very unfortunate," he disagreed with the Australian's hands-on approach to nature television. Claiming Irwin would "interfere with nature, jump on animals, grab them, hold them, and have this very, very spectacular, dramatic way of presenting things," Cousteau dismissed Irwin's technique as counter-productive and merely a way to draw in television viewers. To define his personal approach, Cousteau explained that, "You don't touch nature, you just look at it. And that's why I'm still alive. I've been diving for over 61 years - a lot more years than he's been alive - and I don't mess with nature." Cousteau expressed this opinion while promoting his recent 6-part PBS special called "Ocean Adventures." Ironically, during one of the episodes, Cousteau was filmed grasping the dorsal fin of a great white shark and "riding" the fish for several minutes. Excuse me, Mr. Cousteau, but that sounds an awful lot like touching nature.

SOURCE: THE SYDNEY MORNING HERALD ■

AUSTRALIAN ZOO

The late Steve Irwin,
Australian conservationist

news

Edited by
Willy Volk

A first look at what is believed to be a new species of piranha. The fish is one of a number of apparently new animal species discovered during a survey by Conservation International (CI) scientists of the Orinoco and Ventuari rivers in Venezuela

A lifeboat from UK's Royal National Lifeboat Institution. Since the RNLI was founded in 1824, its lifeboats have saved more than 137,000 lives. RNLI is a charity dependent on private donations. Further information: www.rnli.org.uk

Cousteau versus Cousteau

Speaking of Jean-Michel, his father's widow, Francine Cousteau, has spoken out against a 1,500-unit condominium development on Hawaii's Big Island that Jean-Michel is helping build. The 434-acre project—Sea Mountain at Punaluu, which will consist largely of condominiums but will also include a hotel and a resort—would be the biggest single development ever undertaken on the east side of the island. Claiming she is "extremely concerned about the potential environmental implications of the Sea Mountain resort," Francine -- Jacques Cousteau's second wife and president of the Cousteau Society -- openly opposes the venture. Though Jean-Michel insists he will make the project environmentally and culturally sensitive, the project has drawn opposition from environmentalists who say it will harm threatened and endangered species, like the hawksbill turtle. Cousteau's nonprofit organization, the Ocean Futures Society, has been involved in a number of similar projects in places such as Fiji and the Cayman Islands, and he insists his society would take its name off the project if it is not completed in an environmentally conscious manner. SOURCE: MSNBC.COM ■

Divers Break Record for Underwater Dancing

On October 27, 74 divers plunged into a pool at Sydney's Olympic Park Aquatic Centre. Their goal: to set the world record for underwater dancing. The divers were required to dance simultaneously for ten minutes to set the record. No word yet on what song the divers sluggishly boogied to. Though Guinness World Records has not yet confirmed the record, the photos of the event speak for themselves.

SOURCE: EN.CE.CN ■

David Swain Denied Re-trial in Wife's Death

In 1999, American diver Shelley Tyre was vacationing in Tortola with her husband, David Swain. While diving with him one day, Tyre mysteriously drowned. Although Tortolan authorities ruled the death accidental, Tyre's family brought a wrongful death suit against Swain, alleging he had been motivated by money and was pursuing an affair with another woman. Swain maintained his innocence and collected hundreds of thousands of dollars after his wife's death, including two insurance payments. In court, the prosecution alleged that Swain attacked Tyre from behind, restricted her air supply, and held her underwater until she drowned. During the trial, Swain acted as his own lawyer—though he was absent for most of the proceedings—and dismissed Tyre's death as a "tragic accident." A jury found Swain guilty earlier this year, and awarded Tyre's parents more than $3.5 million in damages; thanks to compounding interest, the award now stands at more than $6 million. For his part, Swain has declared bankruptcy and asked the Rhode Island Supreme Court for a new trial, claiming that Superior Court Judge Patricia Hurst denied him his right to an attorney by refusing to delay the start of his trial after one of his lawyers grew ill from cancer. However, earlier this month, the State rejected the re-trial, on the grounds that Swain failed to raise this issue while the trial was underway. SOURCE: BOSTON.COM ■

Diver "Missing" for 56 Hours Will Not Be Charged

One Saturday morning in September, 35-year-old Guernsey-resident Matthew Harvey told his family he was going for a solo dive in a shallow bay off the Channel Islands. Several hours later, after Harvey had failed to return from the dive, his family notified local authorities, and police frogmen, lifeboat crews, and coastguard helicopters began to search for him. Missing for 56 hours, Harvey astonishingly appeared 200 yards from shore -- exhausted but alive -- claiming he'd been knocked unconscious by a motorboat and swept out to sea. Naturally, media outlets went crazy with the story, marveling at Harvey's miraculous 2-and-a-half-day ordeal. Some news sites even reported that a pod of dolphins brought him to safety. However, on the British mainland, people reported having seen Harvey at a pub while he was "at sea," and a Guernsey storage facility reported that Harvey had deposited his dive gear with them for safekeeping. In reality, Harvey hadn't been knocked unconscious: he left his dive gear at the storage facility, took a ferry to the British mainland on Saturday, and returned to Guernsey on Monday morning. Despite the fact that the rescue effort cost in excess of £10,000, Guernsey Police duty inspector Jean-Pierre Le Breton said no charges will be brought against Harvey. The motives for Harvey's disappearance remain a mystery; although no "other woman" has been implicated, many wonder about Harvey's mental health. So far, the best excuse has come from Harvey's father: "He just lost his mind. It was some sort of breakdown. He just decided to get on that ferry in a moment of madness. To get back into the water like that was a cry for help. He told me that he has no recollection and cannot account for what he did." SOURCE: SCOTSMAN ■

Katie Melua Sets Record for Deepest Underwater Concert

Guinness World Records has confirmed that British singer Katie Melua has entered the record books by playing the world's deepest underwater concert. Melua and her band performed for commercial oil workers 303 meters below sea level on the Statoil Troll A gas rig in the North Sea. Claiming the concert was the "most surreal gig I have ever done," the 22-year-old singer underwent extensive medical tests—and even survival training in Norway!—before switching on her mic. SOURCE: BBC ■

Katie Melua at work

news

Edited by
Willy Volk

John Chatterton in action

PHOTO COURTESY OF JOHNCHATTERTON.COM

Nanologix Retains John Chatterton as a Consultant

NanoLogix, Inc., a nano-biotechnology company engaged in the research, development and commercialization of technologies for alternative sources of fuel, recently announced that deep sea diver John Chatterton has been retained as a consultant for the firm. A former commercial diver, Chatterton is a U.S. Coast Guard licensed captain, and holds numerous commercial, scuba, and rebreather diving certifications. Currently, Chatterton co-hosts the Deep Sea Detectives television series, which showcases his groundbreaking diving adventures. Documentaries about Chatterton's diving expeditions and discoveries have also aired on HBO and PBS. In August of 2005, Chatterton and his partners explored the RMS Titanic, diving to a depth of approximately 12,500 feet in MIR submersibles. Chatterton is probably most famous, however, for his work in the discovery and subsequent identification of the German submarine U-869, off the coast of New Jersey. The story of the discovery was turned into a bestselling book by Rob Kurson called Shadow Divers, and the movie rights were purchased by 20th Century Fox. Bret Barnhizer, Energy Marketing Consultant for NanoLogix, said, "John and I first worked as a team when we served together in Vietnam in 1970 and 1971... As a deep sea diver, John's knowledge of the technical aspects of rebreather devices and gas mixtures as they apply to biological processes is directly relevant to our patented hydrogen bioreactor system."

SOURCE: PRNEWSWIRE.COM ■

Marine Biologist Brad Norman Honored

Australian Brad Norman, a marine biologist who has spent 14 years researching whale sharks at Ningaloo Reef in Western Australia, has been chosen as a Laureate in the 2006 Rolex Awards for Enterprise, which recognize outstanding contributions to humanity, science and the environment. Assembling data and photographs from divers all over the globe, Norman has created an online library of whale shark encounters from around the world. This work has helped monitor the status and abundance of Earth's largest fish, considered "vulnerable" to extinction by the World Conservation Union. Despite Norman's work, however, little is known about the population numbers, breeding habits and habitat preferences of the whale shark. Norman's use of the data of thousands of people in the conservation of whale sharks was described as "visionary" by the Rolex Awards. Appropriately, Norman plans to use his £53,000 award money to devote two years to training local authorities, tourism operators and 20 research assistants around the Pacific, Atlantic and Indian oceans to observe, record and protect whale sharks. He may pop a bottle of bubbly, too. SOURCE: DIVEMAGAZINE.CO.UK ■

FILE PHOTO: TIM HOCHGREBE

Whale shark

Diver Outreach Program Unveiled by Oceana.org

In line with its ongoing efforts to encourage ocean users to protect, conserve and restore the oceans, Oceana has unveiled a new website called www.oceana.org/dive which is dedicated to the SCUBA diving community. The new website is a key component to the organization's diver outreach program. For eco-conscious divers, the website will serve as a reference tool from which they can learn more about threats to marine ecosystems. They can also find fun ocean facts and other divers committed to the ocean's future. There are hopes that the website will encourage the scuba diving community and other conservation-minded individuals to become engaged in the organization's campaing to stop destructive trawling and increase the protection of deep-sea coral and sponge habitat, which more and more divers experience personally in their dives around the world. SOURCE: OCEANA.ORG/DIVE ■

Beautiful Oceans Science Diver

Want to learn more about diving and coral ecology at the same time? Now you can with Beautiful Oceans new courses for the Science Diver. Beautiful Oceans lets divers go beyond basic dive training and gain knowledge about the coral ecosystems they love and the creatures that inhabit them. With the Science Diver education, divers gain fascinating insights into these creatures' lifecycles, behaviors and relationships with other organisms through linked land-based tutorials and discovery dives with a trained Science Instructor.

Upon completion of at least one science course, a certified SCUBA diver receives the distinction of Science Diver. After completing all five science courses, the diver receives the title, Master Science Diver.

Science Divers are recognized for their knowledge of and commitment to the world's coral reefs. For more information about the course, visit: **Beautifuloceans.com** ■

Scientists Discover Bacteria That Use Radiated Water as Food

Deep inside a gold mine about 2.8 kilometers below Earth's surface researchers from Indiana University have found a self-sustaining community of bacteria that rely on radioactive uranium to convert water molecules to useable energy, according the journal Science

Many scientists have been skeptical of subsurface bacterial communities being completely disconnected from surface ecologies fed by the sun's light but new evidence points out that the bacterial communities are indeed permanent—apparently millions of years old—and depend on radiation from uranium ores for their existence.

The scientists sampled the flowing fracture water which contained hydrocarbons and hydrogen not likely to have been created through biological processes, but rather from decomposition of water exposed to radiation from uranium.

DNA analysis revealed a vast number of bacterial species present, but the samples were dominated by a single new species related to hydrothermal vent bacteria from the division *Firmicutes*. Analysis also suggests subsurface Firmicutes were removed from contact with their surface cousins anywhere from 3 to 25 million years ago.

Firmicutes do not use radiation directly as a source of energy, however. Radiation emanating from uranium minerals in or near the fracture allows for the formation of hydrogen gas from decomposition of water and formation of sulfate from decomposition of sulfur minerals. Firmicutes are able to harvest energy from the reaction of hydrogen and sulfate, allowing other microbes in the fracture community to use the chemical waste from the Firmicutes as food. ■

Lampreys Have Been Around for 360 Million Years

Scientists from South Africa and the US have uncovered a remarkably well-preserved fossil lamprey from the Devonian period in an ancient South African lagoon. The find of the 4.2-centimeter fossilized specimen reveals that the blood-sucking, eel-like fish of today hasn't changed much in 360 million years.

The ancient lamprey attached its toothy, sucker-like mouth to, for example, prehistoric sharks almost exactly the same way that modern lampreys latch onto other fish today. This jawless mouth sets the lamprey and its cousin, the hagfish, apart from all other modern vertebrates—animals with backbones.


GREAT LAKES' FISHING COMMISSION

Lamprey's mouth.


WWW.FOSSILMALL.COM

The lamprey fossil is only 4.2 cm wide — and 360 million years old

Like modern lampreys, the ancient lamprey had a backbone made not of bone but of cartilage—the generally translucent, somewhat flexible substance that gives human noses and ears their shapes and that makes up shark skeletons. Unlike bony fish, only a handful of lamprey fossils have ever been found, because cartilage usually decays too fast to become fossilized. Perhaps most important, the new lamprey fossil is the first to give us a good view of the mouth.

It is believed that jawless marine animals were the first vertebrates and that they emerged sometime after 540 million years ago. When the fossilized lamprey lived, there were probably many types of jawless vertebrates. Of the 46,000 known species of vertebrates, lampreys and hagfish are the only surviving jawless vertebrates. The evolutionary split between jawless and jawed fish probably happened close to 500 million years ago.

SOURCE: NATURE ■

Sea 'Monster' Fossils Found in the Arctic

Norwegian scientists have discovered a "treasure trove" of fossils belonging to giant sea reptiles that roamed the seas at the time of the dinosaurs. The 150-million-year-old fossils were uncovered on the Arctic island chain of Svalbard. The finds belong to two groups of extinct marine reptiles—the plesiosaurs and the ichthyosaurs. These animals were the top predators living in what was then a relatively cool, deep sea.

One skeleton, which has been nicknamed The Monster because of its enormous size, may measure more than 8m in length. Palaeontologists from the University of Oslo's Natural History Museum discovered the fossils during fieldwork in a remote part of Spitsbergen, the largest island in the Svalbard archipelago.

Jorn Harald Hurum, co-director of the dig, said he was taken aback by the sheer density of fossil remains in one area.

"You can't walk for more than 100m without finding a skeleton. That's amazing anywhere in the world," he told BBC News. ■


HEINRICH HARDER, 1923

West Australian Fish Fossil Find Rewrites Land Mammal Evolution


AUSTRALIAN NATIONAL UNIVERSITY (ANU)

A primitive fish that swam in tropical reef systems before life clambered up on land had more advanced features than previously thought, a new study finds.

Gogonasus was an ambush predator, about 12 inches long. Once the species died out, the skeletons got buried by layers of shale in what is called the Gogo Formation.

A 380 million-year-old fossil fish called Gogonasus fossil fish has been unearthed in the West Australian Kimberley. The specimen, whose middle ear and limbs resemble those of land vertebrates, could be one of the missing links between fish and four-legged land vertebrates, bringing researchers closer to the point when life reached the water's edge.

The fish's skull had large holes for breathing through the top of the head but importantly also had muscular front fins with a well-formed humerus, ulna and radius—the same bones that are found in the human arm. The new fossil proves that features of land-living tetrapods (four-legged vertebrates) evolved much earlier in their evolutionary history than previously thought. This means that humans can trace their evolutionary roots, and adaptations for life on land, further back in time, to more than 380 million years ago.

The research findings are published in the journal Nature. ■

wreck rap

Polluce

Case closed

The trial for the three British divers accused of modern-day piracy was held in October. They were accused of stealing items from the *Polluce* wreck and damaging the artistic and cultural patrimony of property belonging to Italy, and were facing up to four years in jail. The men recovered quite a coin stash— silver, gold and diamonds—and they initially claimed that they had consent from both the British and Italian governments to do so. The prosecutor did not agree, he claimed that the divers used false paperwork to get access to the wreck. Today, the men on trial claim that everything is returned, and that they are sorry. ■

Get the full intriguing story about the *Polluce* wreck in X-Ray Mag #7 and #8

A Future Reef with a Lot of History

The *Texas Clipper*, who served America well through a number of wars and occupations takes the plunge in the Gulf of Mexico next year as part of The Texas Parks and Wildlife's Artificial Reef Program. A lot of history follows her on this, her last mission as an artificial reef on the sandy bottoms of the Gulf.

The *Texas Clipper* was originally a troop transport ship in World War II. She ferried troops into battle and brought back wounded. After that, she was part of the American occupation at Sasebo, Japan. She was decommissioned in 1946. From 1948 to 1958, she served as one of the post-war four aces for American Export Lines. Then she sailed in the Mediterranean as a cruise liner. Her longest mission was as a training ship for the Texas Maritime Training Academy, from mid 60's to 1996. I am sure she will be remembered by many students, fondly or not. Those with a dive certificate will have a chance to relive their time on board next year when the *Texas Clipper* takes the plunge to settle on the sandy bottom of the Gulf of Mexico off Port Isabel. She will be more than a typical artificial reef. Chances are that she will become a world class diving destination, an oasis for marine life in an otherwise vast expanse of open Gulf of mostly sand and mud bottom. ■

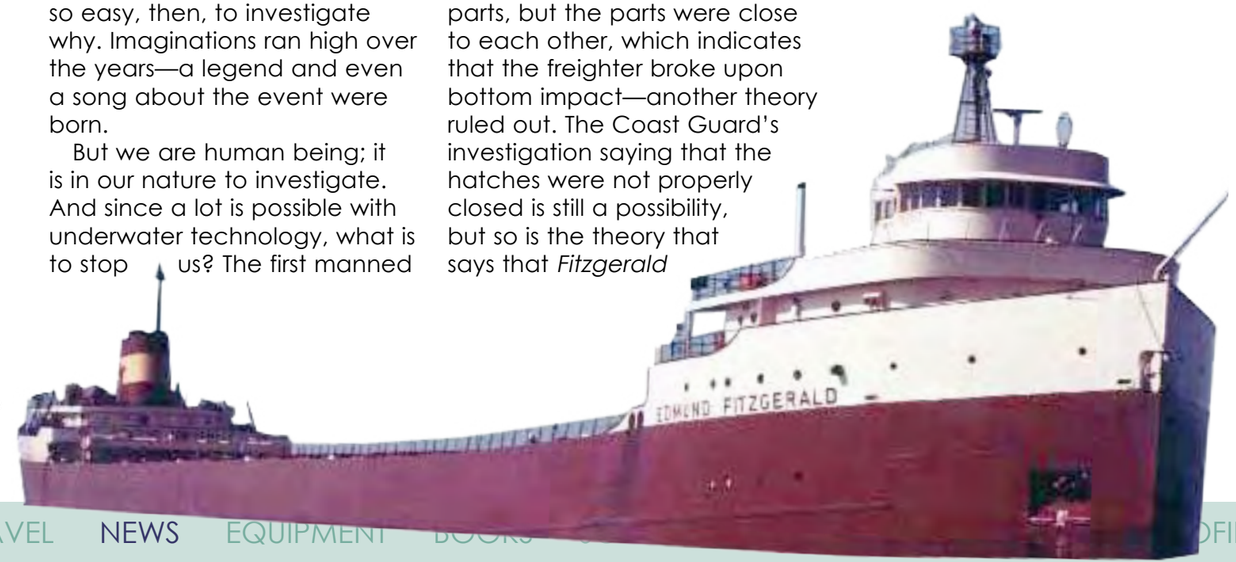
The *Edmund Fitzgerald*, Stuff of a Legend

15th November 2006 was the 31st anniversary of the sinking of the *Fitz* in eastern Lake Superior. Not one of the 29-man crew survived. No one knew why *Edmund Fitzgerald* went down.

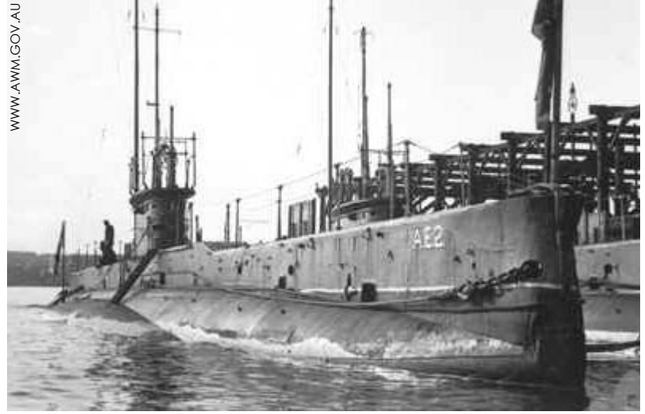
A number of theories as to why she sank have been bounced around over the years, and up to this day, it is still a mystery. The freighter went down in a full-blown storm with hurricane force gusts and huge waves. The Coast Guard investigated the sinking. Their theory was that the hatch covers might not have been secured. Another popular theory was that she broke in two sections due to the wave actions. Only one way to find out, right? Look for your self. Well the wreck made a landing 530 feet down. Not so easy, then, to investigate why. Imaginations ran high over the years—a legend and even a song about the event were born.

But we are human being; it is in our nature to investigate. And since a lot is possible with underwater technology, what is to stop us? The first manned dive was made in 1980, with Cousteau in one of his mini subs. Starting in 1989, the Great Lakes Shipwreck Museum sent down an underwater robot with cameras. In 1994, Harbor Branch Oceanographic-Florida, visited the wreck with a submersible, and even though the project at hand was to study the ecology of the bottom of the Great Lakes, three days were spent diving on the *Fitz*.

Other dive expeditions have tried to solve the mystery. What they found was that the wreck indeed was broken in two parts, but the parts were close to each other, which indicates that the freighter broke upon bottom impact—another theory ruled out. The Coast Guard's investigation saying that the hatches were not properly closed is still a possibility, but so is the theory that says that *Fitzgerald* could have scraped a sandbar due to an inoperative radar. So today, November 2006, where do we stand on this mystery from the past? Even though one theory is ruled out, there are many more to investigate, and despite all the underwater technology, we still have a mystery. the *Fitz* is deep in mud, well settled. So, at this time, the hull can't be inspected for damage—hence, still a mystery for future divers and investigating minds. ■



wreck rap



WWW.AWM.GOV.AU

Divers to Explore Historic Gallipoli (WWI) Submarine

Australians may soon know more about one of Gallipoli's untold stories—the Australian submarine *HMAS AE2*. It is referred to as the Silent Anzac and it was the first allied submarine to penetrate Turkey's Dardanelles as part of a wider submarine campaign that paralyzed enemy shipping in the Sea of Marmara. It was also the first allied submarine to be lost after entering the Dardanelles, off the Gallipoli coast, in 1915. The sub entered the straits of the Dardanelles on April 25, 1915, as the Anzacs first landed on the beaches.

Its Australian crew dodged minefields, evaded patrol craft and survived heavy shellfire before torpedoing a Turkish gunboat. But *HMAS AE2* came under attack from a Turkish torpedo boat, resulting in the crew losing control of the vessel and being forced to abandon ship. Thirty-five people survived when it sank, and now it lies about 75 metres under water.

Now the story of the vessel will be told in detail. The Australian Federal Government and the Submarine Institute of Australia are contributing about $800,000 to survey and preserve the *HMAS AE2*.

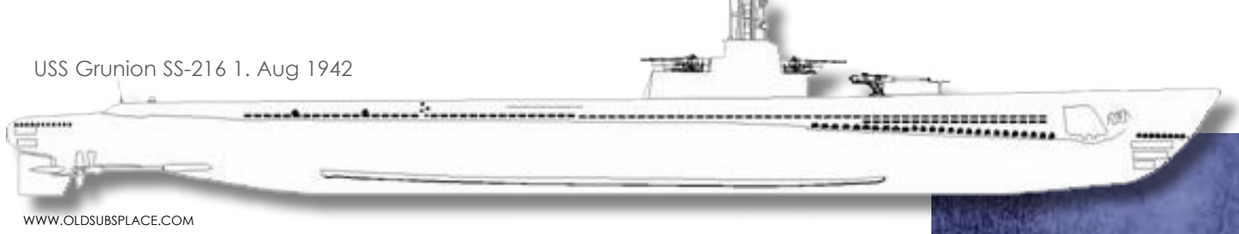
The Minister Assisting the Minister for Defence, Bruce Billson, says Australian divers will carry out the survey sometime next year. "To see how we can best preserve it, how we can best bring to life the story of the *AE2* and then to consider options for its long-term management and care," he said.

Mr Billson says it is too early to know if parts of the submarine can be brought to the surface and restored. "At this stage it's a little too early to know," he said.

SOURCE: ABC NEWS ■

Oriskany DVD

Oriskany CVA34 – Status Report 06.19.06 to be released by the end of 2006 by ClearVis Productions, features the biggest vessel ever to be intentionally sunk to create an artificial reef. See the Books Section on page 77 for details.



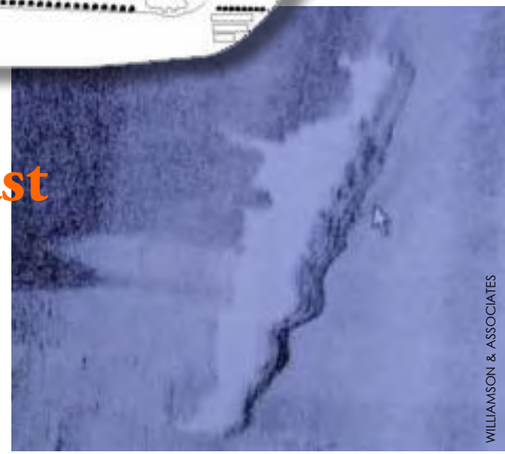
Shadowy Object Off Alaska Coast May Be Lost WWII Sub

For decades, relatives of the *Grunion's* 70 lost crewmen had no information beyond fragmented U.S. Navy records, and a few rumours, about where and why the sub went down. They knew the *Grunion* had sunk two Japanese submarine chasers and heavily damaged a third in July 1942 near Kiska, one of two Aleutian islands occupied by the Japanese. They knew her last official radio message to the sub base at Dutch Harbor, on July 30, 1942, described heavy enemy activity at Kiska Harbor. They knew she still had 10 of her 24 torpedoes during that communication. They knew Dutch Harbor responded with an order to return to the base, but they didn't know if *Grunion* ever received it. Until a few years ago, the clues were too sparse to justify a search, said Bruce Abele, whose father, Mannert Abele, was the *Grunion's* commander.

Four years ago, a man who had heard about the *Grunion's* disappearance emailed Bruce the links to several *Grunion* websites. One site held an entirely new clue, a note from a Japanese model ship builder who said he thought he knew what had happened to the *Grunion*. John Abele contacted the man, Yutaka Iwasaki, who translated and sent him a report written in the 1960s by a Japanese military officer who served in the Aleutians. It described a confrontation between a U.S. submarine and the officer's freighter, the *Kano Maru*, on July 31, 1942, about 10 miles northeast of Kiska—the *Grunion's* patrol area.

The sub dispatched six or seven torpedoes. All but one bounced off the boat without exploding, or missed, the officer wrote, although the hit knocked out his engines and communications. He said he returned fire with an 8-cm deck gun, and believed he had sunk the sub.

The Abeles then hired a marine survey firm, Williamson and Associates which after six hours of negotiating, agreed to send sonar technicians and equipment aboard a Bering Sea crab boat to the frigid waters licking the base of Kiska volcano. The U.S. Navy, citing lack of resources, is not involved in the search, and the Abeles prefer to keep the cost to themselves.



WILLIAMSON & ASSOCIATES

An underwater sonar image of a black shape near Kiska Island that may be the *USS Grunion*, which sank off the island at the tip of Alaska's Aleutian chain in 1942

For more than two weeks, the Aquila carefully towed a sonar cable from east to west and back again inside a 240-square-mile grid that the survey team had plotted using information from naval archives and the *Kano Maru* officer's account. In mid-August, the sonar picked up a 290-foot-long object with the sharp angles and jutting shadows of something man-made wedged into a terrace on the steep underwater slope of the volcano.

The *Grunion*, however, was 312 feet long. The Williamson team believes the bow may have plowed beneath a mat of thick sediment, hence the apparent shortage of about 20 feet. Skid marks show the vessel slid to rest about 1,000 meters from the surface. SOURCE: ASSOCIATED PRESS ■

Wrecks of Two Mysterious Submarines Discovered Off the Coast of Orkney, Scotland

A survey team discovered two wrecks lying in about 70 metres of water to the east of Sanday Sound in an area where there were no reports of wartime sinkings, a coastguard official said.

Grainy images of the submarines were captured using the latest three-dimensional sonar device, but their identity and nationalities are not known. An Orkney diver speculated that the vessels might have been German U-boats sunk during the Second World War. There were reports that the Royal Navy had successfully depth-charged U-boats, but this took place several miles away.

Rob Spillard, hydrography manager of the Maritime and Coastguard Agency, said the sunken submarines were something of a mystery."We have no idea which subs they are, which nationality or who died in them," he said. SOURCE: THE SCOTSMAN ■

Lost and found - *USS Macon*

USS Macon (ZRS-5) was a massive airship made for scouting in the service of U.S. Navy. She was designed to carry five F9C Sparrowhawk biplanes. The planes were kept inside the hull, in bays. A trapeze was used for launching and retrieving the planes. She looked impressive, like a giant blimp, but she had a short career.

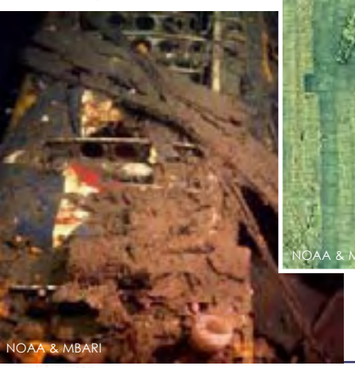
During a storm she went down after only two years of service, 1933 - 1935 , and got lost off the coast of California. The storm threw the *USS Macon* into an updraft; the structure was compromised and trailing cables punctured the rear cells. She fell slowly from the sky; it took almost 20 minutes. Then, she went down. Almost the entire crew survived, thanks to life jackets and warm water.

She was lost for a long time, and it was The Monterey Bay Aquarium Research Institute (MBARI) that found her in 1991, or at least, the debris field left of the *Macon*. Artifacts were retrieved that helped identify the wreck, and video clips, sonar images and photos were taken.

The MBARI returned in 2005-06 to conduct an archeological research project in the bay. Researchers from NOAA were brought in, and video clips from the site are now available to the public through the OceansLive Web Portal, a service of the NOAA. Researchers are mapping the underwater wreckage with an underwater robotic explorer. With the help of 10,000 images captured, they will make a photo mosaic of the site.

The hope is to get the site listed on the National Register of Historic places. The wreck site has not been released to the public, and it will remain a secret for now. No diving is allowed. Not only is it too deep for recreational diving, it is also considered a U.S. Navy gravesite.

SOURCE: NOAA & MBARI.ORG ■



Scenes from the *USS Macon* wreck

US Navy Divers Survey WWII Aircraft

Two U.S. Douglas Torpedo Bomber Devastators, which played an important role in World War II, were surveyed by a team of divers from the *USS Safeguard* assisting the Naval Historical Center and The International Group for Historic Aircraft Recovery.

Lost since the early days of the war, the wrecks were investigated over four days of diving during which data and samples were collected for scientific analysis to find out if the wrecks were suitable for recovery and preservation later.

Safeguard's commanding officer Lt. Cmdr. Doyle Hodges told Navy News: "This was a unique opportunity for *Safeguard* to be involved in the conservation and preservation of an important part of naval history." He added, "Just the process of getting to the wreck site in the Marshalls gives you a good appreciation for the bravery of the Sailors who took these aircraft with rudimentary navigation systems across thousands of miles of open ocean. Additionally, the diving conditions in the lagoon were terrific."

Immediately after the bombings of Pearl Harbor in WWII, the planes went directly after the Japanese headquarters on the Marshall Islands, but were lost in this first U.S. offensive strike. Launched from the *USS Yorktown* (CV5), weather conditions made their mission difficult, and the pilots of the bombers could not make a path for return on the sortie. They ran out of fuel and ditched in the large central lagoon near the Jaluit Atoll where they lay at rest today. SOURCE: NAVY NEWS ■

Pollution Leaking from WWII Ships in Chuuk Lagoon

Sunk more than 60 years ago, some Japanese war vessels are leaking greater amounts of diesel, oil, fuel and toxic chemicals into the island-dotted lagoon of Chuuk, which has some of the best diving sites in the world.

Speaking on the subject at the Stockholm Convention on Persistent Organic Pollutants (POPs), Joe Konno, former Director of the Chuuk Environmental Protection Agency, said,"The rate of leakage is rising dramatically."

It could be one of the biggest environmental catastrophes to hit the shores of on of the most populous states of Micronesia as 57 wrecks made up of cargo ships, destroyers, transports, submarines, tugs, tankers, carriers and other vessels rest on the sea bed carrying enough raw power and munitions now used by locals to blow up areas of the lagoon and its reefs for illegal fishing.

During WWII, the U.S. viewed this Imperial Navy base as primary target. The U.S. unleashed Operation Hailstone at the location for a two-day aerial bombing campaign, which was carried on with several more confrontations until the end of the war.

Environmentalists are very concerned with the imminent environmental threat these wrecks impose on the area and suggest a cooperation between Japan and local government should be developed to take care of the problem. SOURCE: KASELEHIE PRESS ■

Roman Shipwreck Bearing Gifts of Fish Sauce

Delicacies to thrill the richest palates of the Roman Empire filled the storage hull of a shipwrecked first-century vessel. Nestled inside some of the hundreds of meter-tall amphoras, or clay jars, on the ship were 2,000 year-old fish bones.

Archeologists were delighted with the dazzling find which should provide a lot of information about life in the ancient world.

The cargo of amphoras was discovered in 2000 by boaters when their anchor lodged itself in one of the two-handled jars. Years of red-tape later, Carles de Juan was able to begin exploration of the site, which is located off the coast of Alicante in Southeast Spain.

Estimated at 30 meters long with 400-ton cargo capacity, the vessel is twice the size of most other Roman shipwrecks found in the Mediterranean according de Juan who told Associated Press that the freight has approximately 1,500 well-preserved clay amphoras, used to hold a condiment, fish sauce, highly prized by rich Romans.

Archeologists not related to the project such as, Javier Nieto, director of the Center for Underwater Archaeology of Catalonia agree that the shipwreck is very important not only for its size and easy access that it offers—just 25 meters (80 feet) below the surface at about 1.5 kilometers (one mile) from the coast—but also because of the fine condition of the cargo.

"For archaeologists, a sunken ship is a historic document that tells us about ancient history and how its economy worked," Nieto of Barcelona told Associated Press. "This ship will contribute a lot."

It is thought that the ship probably sank in a storm while sailing back to Rome from Cadiz in the south of what is now Spain. It must have been a terrible storm because it was not common for such a vessel to be so close to shore.

"The crew did not care about the cargo or money or anything. They headed for land to save their lives," said de Juan.

Unfortunately, the wreck site was not immune from raiding by pirate scuba divers who stole some of the amphoras after the first announcement of the find in 2000. The action forced the Valencia government to construct a thick metal grating to protect the jars and cover the remains.

Because the seals on the amphoras were not hermetically sealed, the fish sauce isn't in them anymore having not been able to20 centuries under the sea. But fish bone traces do remain inside and can help researchers figure out how the sauces were made according to de Juan.

"We knew it was an important find but had no real idea until now," said de Juan. "It is an exceptional find." SOURCE: ASSOCIATED PRESS ■

MARIAMILANI

Found: Civil War Schooner?

Officials aren't saying yet, but a wreck discovered off the coast of south Baldwin County in Alabama, USA, might very well have been a blockade runner in the Civil War.

Remains of a wooden ship were noticed by local residents after high tides and strong waves revealed parts of the vessel at the surf line near Fort Morgan. The 150-foot ship was found charred near the beach level. Over history, hundreds of ships ran aground in this area, so civil war experts speculate whether or not exact identification of the ship can be made. However, there are military reports that a schooner, *Monticello,* was beached and deserted eight miles from Fort Morgan, then burned by the Union Navy in 1862. Further investigation will be needed to get to the bottom of the mystery. SOURCE: PRESS REGISTER ■

Aquariums in the News:

London's New Coral Reef

The £85m Biota Aquarium in London will be installing an enormous coral reef made up of living colonies from the Pacific and Indian oceans. London zoo marine specialists are "growing" the reef for the aquarium designed by Sir Terry Farrell as part of a 1.5£ billion scheme to rejuvinate the London Docklands. To be completed in 2009, the reef is planned to reach 9ft high and 24ft across in a tank with tropical fish for an exhibit in which visitors can be immersed as they walk through the aquarium. A team from the Zoological Society of London is supervising the project. ■

Public Supports Vancouver Aquarium Expansion

Over 4,000 people took part in a public survey which found higher than expected support for a proposed expansion of the Vancouver Aquarium. The expansion proposal includes a 30% increase in the size of the Aquarium at a cost of $80 million. Improvements mainly benefit marine mammals which may include whales and dolphins if they are returned back into the wild if the public has its way. It is hoped that the construction will start next spring so the facility will be completed by the 2010 Winter Olympics. ■

U.S. aquarium docs examine whalesharks

Scientists at the Georgia Aquarium in Atlanta met with a whaleshark for a ground-breaking check-up. With the help of around 50 staffers, a stretcher big enough to hold a mini-bus and a hose transporting up to 300 gallons of liquid anesthetic, they examined Ralph, a 22-foot (6.6-meter) male, one of four whale sharks at the aquarium. Not much is known about the world's largest fish, so researchers hope the study will produce new information about the mysterious animal of massive size and wide-ranging habitat. Ralph and Norton, the other male whale shark at the aquarium, traveled from Taiwan to Atlanta last June luckily before they met their doom as seafood in Taipei. Two females, Trixie and Alice, joined them a year later at the aquarium where they live together in their 6 million gallon tank. SOURCE: ASSOCIATED PRESS ■

FILE PHOTO: TIM HOCHGREBE. UNDERWATER.COM.AU

Bering Strait Appeared Earlier Than Thought

Researchers from Woods Hole Oceanographic Institution in Massachusetts, USA, have set the record straight on the Bering Strait. According to new findings, it actually appeared 1,000 years earlier than believed. This would have made human travel by foot across the bridge impossible 1000 years earlier too.

The scientists reporting to Geology magazine found evidence along the ocean floor where sediment deposits were deep enough to show a view of geological history. From this data, they calculated that the land bridge between what is now known as Alaska and Siberia flooded 11,000 years ago to make the Bering Strait.

Sediment core samples collected from new core sites north and west of Alaska in the Chukchi Sea revealed skeletons of animals called foraminifera that were radiocarbon dated and could be traced to specific water and atmospheric temperatures. The findings suggest that the first humans to come across the bridge to settle in the Americas came much earlier than previously thought. SOURCE: REUTERS ■

Tsunami Risk in the North Sea?

Over 8,000 years ago, a tsunami hit Europe. Since then it has been very quiet, right? Not so, says a new study which reveals that there have been a number of deep-sea earthquakes around Europe since the last big one hit. Scientists say that cities and towns on the North Sea coast are at risk next time a landslide hits the continental slope.

NOAA

Researchers sifted through libraries of ancient texts, church documents, and historical chronicles from as far back as the year 1089 in Great Britain to find a disturbing number of reports and descriptions of earthquakes that came more frequently and in greater magnitude than previously thought. Further research has been done by Scandinavian scientists investigating landslides and underwater cliffs off the Norwegian coasts where the last big tsunami hit.

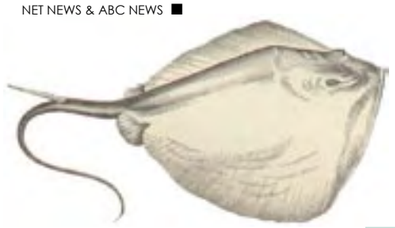
Could a tsunami hit Europe again? Scientists speculate upon several ways it could happen involving an unstable continental slope and the affect an earthquake or rising temperatures and water levels may have on methanhydrates: gas-containing ice caps which keep the sand attached to the slopes like a kind of weak glue. If water levels or temperatures change enough, this 'glue' may fall apart, said Angus Best of the University of Southampton to the scientific journal Eos. Gaps in our knowledge of this subject causes concern in the scientific community who suggest that further research be conducted to better understand the risks of a tsunami in Europe and how to protect ourselves when it comes. SOURCE: SPIEGLE ONLINE ■

Travel News

Edited by Peter & Gunild Symes

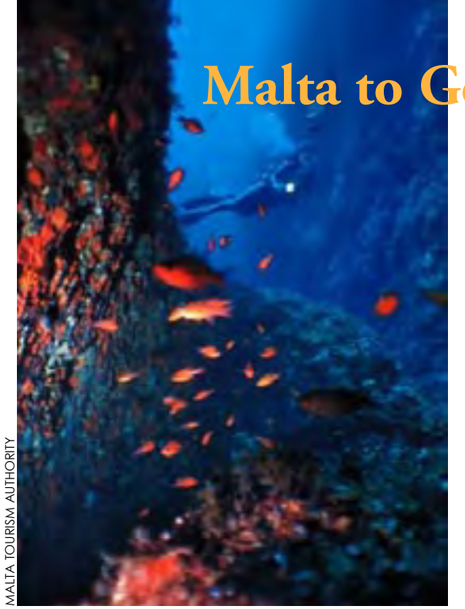
No Major Fall Out in Dive Tourism from Irwin Death

Despite recent doom and gloom reports from some dive news agencies, the death of popular Australian TV personality and conservationist, Steve Irwin, who was killed by a stingray in the fall of this year, has had minimal negative impact if any, according to spokesmen for the Queensland dive tourism industry and the Cayman Islands Tourism Association (CITA), which promotes Stingray City and Sand Bar as local attractions to millions of tourists each year. Indeed, Steve Broadbelt, Chairman of the Water Sports Committee of CITA said that there has actually been a slight rise in numbers of tourists visiting the attractions as compared to the same time last year. While the area is currently experiencing its low season, attendance has been better than expected and may have even been positively affected by the media coverage. Meanwhile, in Australia, tourism agencies are reassuring visitors that the reefs are safe and expect no negative change in the numbers of tourists taking part in scuba diving activities. SOURCES: CAYMAN NET NEWS & ABC NEWS ■



Malta to Get a New "Marine Adventure Park"?

By Willy Volk



MALTA TOURISM AUTHORITY

Malta and Gozo offers some of the most exciting diving in the Mediterranean

According to The Times of Malta, a group of investors—including a fish farmer, a hotelier, and members of the diving community—are proposing a new "highly innovative marine tourist attraction." The attraction would allow divers and snorkelers to swim with sunfish, rays, groupers, sea hounds, dog fish, angel shark, tuna, lampuki and other fish in one of two netted enclosures that resemble modern, large-scale fish farms.

The difference between fish farms and these enclosures is that these fish would be held only for viewing (as opposed to eating). Roughly 10 times the size of Monterey Bay Aquarium, and capable of accommodating up to 125 snorkelers and 75 divers at any time, within the enclosures, the investors plan to install replicas of megalithic temples and ancient shipwrecks to serve as artificial reefs that'll provide habitat for the fish. From the sky, the two enclosures would resemble a ship's portholes. As it would sit half a mile offshore, divers would have to access the area via boat.

The "highly innovative" attraction is currently saddled with the completely innovative-free name Marine Adventure Park. According to a spokesman for the park, "Instead of looking in as one does outside an aquarium, one snorkels and scuba dives among the fish and in many ways interacts with them." The spokesman also claims the Park will adopt a "Noah's Ark" approach to stocking the enclosures, meaning there would not be a large quantity of fish inside the Park, but a healthy and interesting variety.

This sounds like a really interesting concept, meant to make up for the fact that divers and snorkelers are seeing fewer fish while on their excursions. If you're interested in learning more about the proposal, check out the Marine Foundation's PDF proposal or Powerpoint presentation. Although there aren't any designs of the Park, I think you can probably imagine what a giant net enclosure looks like. ■

Galapagos Marine Patrols Get a Leg Up On Poachers

An overhauled U.S. Coast Guard cutter has started patrol duty in the waters of the Galapagos Islands in order to catch poachers at sea. It is the first National Park vessel fast enough to outrun them. Now, park officials finally have a way to catch illegal fishermen that threaten the highly cherished marine life and diverse ecosystem of the Galapagos. Rebuilding of the 95-foot cutter, *Yoshka*, was made possible by funding from the WWF.

The *Yoshka* hails from an illustrious career in its previous life having played an important role in the Cuban missile crisis helping to transport refugees to Miami in 1965. Now, after badly needed repairs, the cutter is again able to reach a top speed of 22 knots and navigate for 7-12 days without refueling, and serve once again on missions to save lives, this time that of precious and endangered sea life. ■

WWF

The U.S. Coast Guard Cutter, *Yoshka*

Philippines, Malaysia and Indonesia to Fight Terrorism With Better Border Patrol

In order to deter operatives of the Southeast Asian regional terrorist network, Jemaah Islamiyah (JI), from entering into Mindanao, the Phiippine Government is seeking to work with Malaysia on bettering boarder patrols.

A proposal from the Defense Secretary Avelino Cruz to the set up sealanes along boarders so officials can effectively monitor the movement of ships was given to Malaysia and Indonesia. According to Cruz, established sealanes would let legitimate traffic flow through the area while helping authorities from the three countries check vessels found outside the lanes. Thereby, strengthening control over unauthorized boarder crossings and illegal activity.

These measures come none too soon as about 30 JI militants are now operating in the Philippines while other bombers and leaders are being hunted in Sulu. SOURCE: SUNSTAR IN MANILA ■

Dahab Gets a own Hyperbaric Chamber

A nine-person chamber is now available at the new hyperbric medical center in Dahab, Egypt, at the northern end of the Red Sea. Although used, the Italien-made chamber is certified and in "great shape" according to Dr Adel Taher, director of the Hyperbaric Center in Sharm El Sheikh.

The Dahab center will help victims of decompression illness more quickly than before when patients had to be evacuated to the Sharm El Scheikh center to be treated. It is also hoped that the chamber will be used for research purposes in coordination with the Italian National Research Center and DAN-Europe. Dr Taher told DIVE that a new recompression chamber will be purchased for Sharm El Sheikh, which will operate in tandem with the current chamber in order to lessen its work load. ■

In Jules Verne's Footsteps

Text by Yann Saint-Yves

Sea Orbiter. Wow. It sounds like a novel by Philip K.Dick or a Stanley Kubrick movie, doesn't it? But the Sea Orbiter is not science fiction but a serious project on its way to become reality. A new Odyssey could soon take its beginning...

Jacques Rougerie is an architect, well known for his incredible boats, which allow passengers to enjoy "undersea sightseeing" through huge plexiglas hemispheres. Long hulls, short hulls, sailing boats with underwater windows to the sea, underwater houses, motor boats—that was his leitmotif between the 70's and the 90's. As every other visionary, he was considered an original and a dreamer.

Right... However, Jacques Rougerie *is* one of those very rare individuals who actually transforms his dreams into reality. His very special boats can be seen all around the world, allowing everyone to discover underwater marvels seated dry and comfortably in the company of the whole family. In a way, his recipe is simple: Aluminium hull, methacrylate panoramic windows, and a particular organic design. Jacques believes that living in the sea, with the sea, is a way to bring its mysteries to light. During one of his recent dreams, he envisioned an incredible boat, able to cruise freely among the longest ocean currents, as the biggest planktonic entity ever met. As a classical boat suddenly put in vertical position, above and blow the water surface at the same time.

Scientific project

Sea Orbiter is not just an impressive boat, it is also a scientific project. Understanding the great ocean currents and their impact on climate and marine life was the first goal of this project. On the other hand, living under the surface is similar to conditions on space crafts where humans need life support systems and have to live in confined spaces while dealing with food, health and energy for long periods of time in relative autonomy. So, it was only logical that NASA took an interest in the project too. After all, they've been training all their astronauts underwater since 1946. Also, the European Space Agency, various environmental protection agencies and scientific organisations have shown interest including Institut de Recherche et de Développement, Woods Hole Oceanographic Institution and the National Oceanographic and Atmospheric Administration. Together, they created the scientific program behind the Sea Orbiter.

The vessel

Imagine a "classic" ship, then cut off the superstructure and seal the deck. Then, place a lot of "plexi" windows along the hull and put a weight of more than 400 tons at the rear end. You finally add a huge underwater wing-shaped

Jacques Rougerie

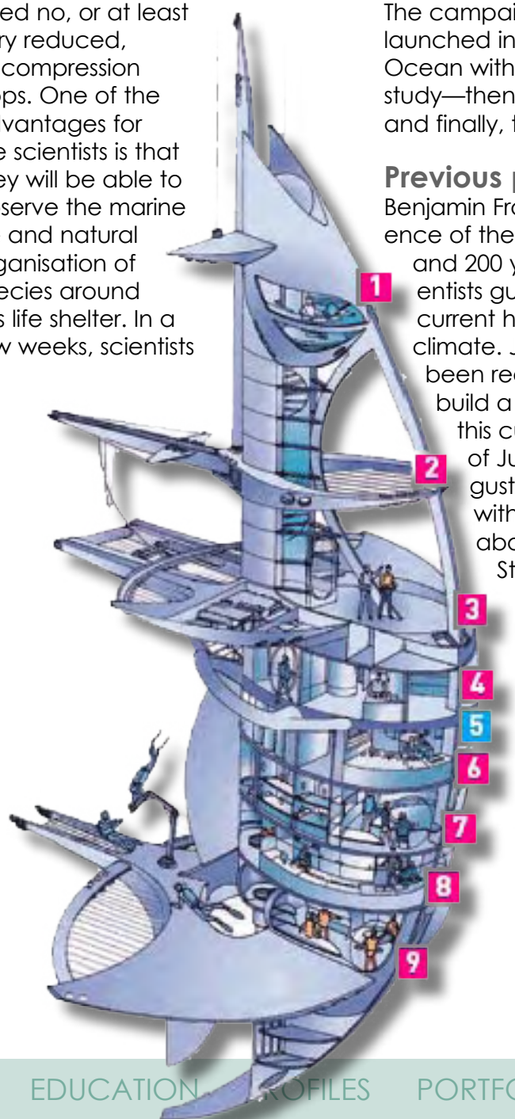
disc all around the now vertical structure for stabilisation. Well, that's the idea anyway...

In reality, it's much better and really quite beautiful. A three-meter high model was first presented in Paris during the centennial anniversary of Jules Verne's disparition (1905) in the Musée National de la Marine. The model, build by MARINTEK in Trondheim, Norway, captivated the imagination of thousands of visitors in the museum. Sea Orbiter is to reach about 51 meters in height and 23,8 meters in width. Twenty meters of the structure is visible above water with 31 meters below the surface.

Clean energy

Originally the project wanted to use 100% "green" energy. But technical solutions for long trips were not efficient enough, and in the end, two of two diesel engines were included for moving the vessel long distances if needed. But this is only for the first model, as the next Sea Orbiter should use some cleaner engine technologies such as hydrogen cells and electric motors. For the rest, fans and solar panels should provide enough energy for life support, steering the vessel and running scientific equipment on board. Crew members will mainly be scientists, divided into two groups since the lowest part of the vessel can be isolated, like a compression chamber, meaning that a part of the team can live in saturation for some time. The pressurized deck has direct access to the ocean, allowing scientists to dive whenever they need to, with great savings in time, as they would need no, or at least very reduced, decompression stops. One of the advantages for the scientists is that they will be able to observe the marine life and natural organisation of species around this life shelter. In a few weeks, scientists may have a complete representation of marine life living at their doorstep. The first missions could last up to two years.

Jacques Rougeries passion for ocean projects goes back a long time. Undersea Village is from1973



1. Upper lookout deck, bridge
2. Trampoline deck, relaxation zone
3. Surface deck
4. Access deck, workshops
5. Sea level
6. Service deck, bathrooms
7. Atmospheric deck, living quarters
8. Research deck, laboratories
9. Pressurised deck, living quarters

Missions

The campaigns should be first launched in 2008-09 in the Atlantic Ocean with the Gulf Stream study—then, the Pacific Ocean, and finally, the Indian Ocean.

Previous projects

Benjamin Franklin proved the existence of the Gulf Stream in 1769, and 200 years later, many scientists guessed that this marine current has a huge effect on climate. Jacques Piccard has been requested by NASA to build a submarine for studying this current : from the 14th of July to the 14th ofAaugust 1969, the *Ben Franklin* with six crew members aboard, drifted in the Gulf Stream at a depth of 100m to 600m. ■

By Tim & Wandy Hochgrebe

Awesome Australia

Diving Down Under the Land Down Under

A coproduction with underwater

YANN SAINT-YVES

Australian Appetizers

Down under Down Under

Introduction text by Wandy and Tim Hochgrebe
Underwater photography by Tim Hochgrebe
all state summaries by Wandy and Tim Hochgrebe
Topside photography by Yann St. Yves
A coproduction with underwater.com.au

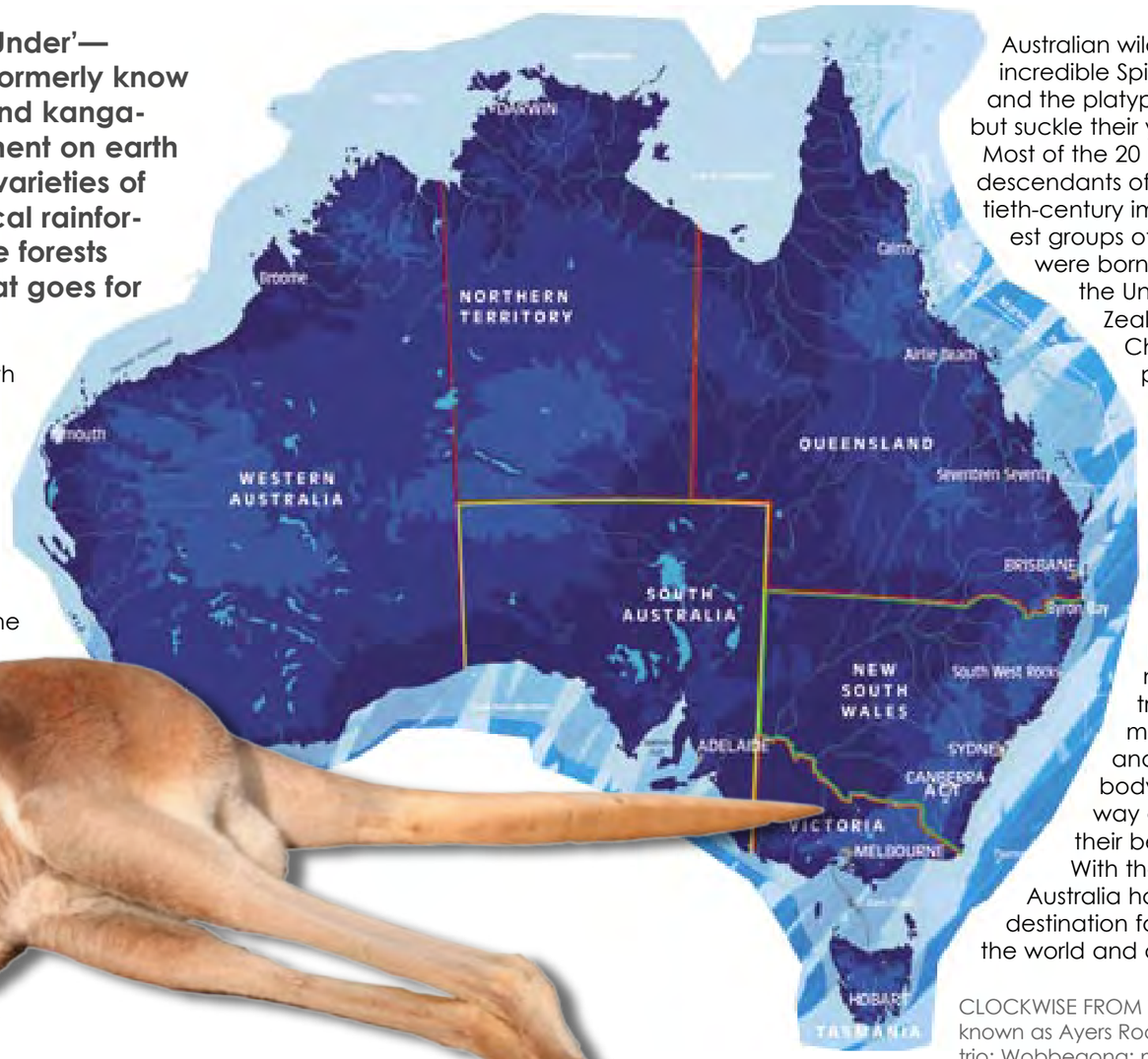
YANN ST YVES

Australia—the land 'Down Under'—renown for Uluru (the rock formerly know as Ayers), its red desserts and kangaroos. But the smallest continent on earth features one of the largest varieties of habitats ranging from tropical rainforest to old-growth temperate forests and alpine heaths—and that goes for underwater as well.

Due to the unique environment with nutrient-poor soils, highly variable weather patterns and geographic isolation, a high percentage of Australia's flora and fauna is endemic and extremely well adapted to their unique surrounds.

The koala in its gum tree is probably one of the best-known icons of the Australian wildlife, but there is also the incredible Spiny Ant-eater (*Echidna*) and the platypus who both lay eggs, but suckle their young.

Most of the 20 million Australians are descendants of nineteenth and twentieth-century immigrants. The five largest groups of the Australians who were born overseas come from the United Kingdom, New Zealand, Italy, Vietnam and China. Only a very small percentage is made up of the indigenous people—mainland Aboriginies and Torres Strait Islanders.



Relaxed

Australians are known for their relaxed attitude, their openness and their love of nature—and all of that is true. Australia is home to many races and religions, and on the whole, everybody accepts each other's way of life—and they all love their beer …

With the increase of air travel, Australia has become a popular destination for tourists from all over the world and anything to do with

CLOCKWISE FROM TOP: Uluru formerly known as Ayers Rock; Seahorse; Dolphin trio; Wobbegong; map of Australia; resting Kangaroo

JOHN SMITH - UNDERWATER.COM.AU

KAREN WILSHAW - UNDERWATER.COM.AU

STEVE GRIFFIN - UNDERWATER.COM.AU

YANN SAINT-YVES

Koala bears snuggle in deep sleep, nestlied in the branches of their favourite Eucaliptus tree

Australia

RON WALSH - UNDERWATER.COM.AU

So where the 'bloody hell' are ya ?

water is extremely popular with locals and tourists alike. The 2005 Surfing World Tour featured five Australians in the top ten—surfing is a cultural icon of Australia. But other watersports like diving and snorkelling enjoy growing popularity.

Although most tourists are aware of the Great Barrier Reef off the North-East coast of Australia, more and more people are discovering the excellent diving in other parts of the continent as well. With a coastline of almost 26,000 km—much of it still reasonably unspoilt—it should not come as a surprise that there are plenty of spots to find amazing marine life.

In the harbour of Sydney, the largest city in Australia, in only a few meters of water dumpling squids, anglerfish, Port Jackson sharks and seahorses as well as their close relative the endemic and incredibly beautiful Weedy Seadragon have found their home.

Further south, kelpforests, seal colonies, rock lobsters, abalone and a multitude of sponges and ascidians colour the rocky reefs.

Off Adelaide, divers have the opportunity to see the majestic Great White Shark from the safety of a cage.

On the other side of Australia, a fringing reef, called Ningaloo provides a magic and unspoilt dive destination. Fantastic coral gardens and walls not far from the mainland and snorkelling with whalesharks and manta rays are some of the highlights—as are spotting dugongs and dolphins.

There are plenty of wrecks to explore, caves to dive, off-shore islands to dream of, endangered animals, aggregation sites for rare species such as the Leopard sharks, the Grey Nurse Sharks, stingrays, cuttlefish and of course the annual coral spawning events.

About 89% of temperate fish species are unique to Australia, so there is no excuse not to come and visit the cooler regions.

This feature about Australia is aiming to go slightly beyond the "road well travelled" and includes some destinations that some divers might not yet have heard about. Australia is a fantastic place to live and dive—so, as they say down under, "Where the 'bloody hell' are ya?" ■

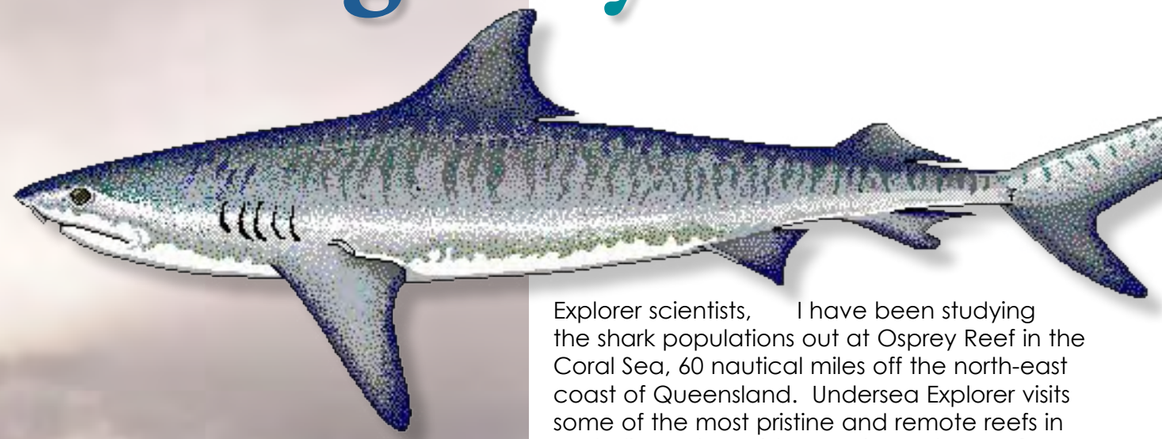
YANN SAINT-YVES

YANN SAINT-YVES

TOP: A pair of Nurse sharks, or Ragged tooth sharks, patrol the waters for prey. ABOVE INSET: Discover Aboriginal culture

SMALL INSET LEFT: Kangaroo X-ing
LEFT: A view of Kata Tjuta from afar

Catch a Tiger by the Tail!



Text by Richard Fitzpatrick
Photos by John Rumney

Hanging onto the dorsal fin of a tiger shark as it swims is a truly awesome experience. Feeling the immense power and strength of these animals is incredible.

Many people think I must have a death wish because tiger sharks are known to be pretty aggressive. I have stopped telling people what I do at social gatherings, it is a guaranteed conversation stopper. "What do you do?" "I tail rope sharks in the open ocean". People either think I am liar or a loony!
I started off working with captive sharks in aquariums around Australia but eventually left the aquarium world to move into underwater filming and to pursue my dream to do hands on research with wild sharks. I teamed up with a research and adventure diving venture Undersea Explorer to help establish a long-term shark monitoring program. For the last nine years, in conjunction with Undersea Explorer scientists, I have been studying the shark populations out at Osprey Reef in the Coral Sea, 60 nautical miles off the north-east coast of Queensland. Undersea Explorer visits some of the most pristine and remote reefs in Australia and provides a unique chance for tourists to do four dives a day whilst interacting with research scientists. Each week divers are able to join expeditions featuring projects on Sharks, Minke Whales, Nautilus, Coral Monitoring and Water Quality.

Osprey Reef

Osprey reef is an ideal dive site and a hot spot for sharks. White tip reef sharks, Grey Reef Sharks and Silver tips are guaranteed and hammerheads also seen regularly. To study the sharks here I need to insert a small id microchip underneath the skin, and for this I need to bring the shark up to the boat. This is easier said than done. Even the smaller sharks are incredibly powerful and quick, so I developed a technique of underwater shark rodeo! A crate of bait is placed on the reef and while the shark is preoccupied by the food, I grab hold of its tail and slip a rope around it. After that it is a gentle swim to the Undersea Explorer where we can do the necessary research with the aim of having real field data on growth, reproduction and home range of these sharks. Our goal is to obtain the information to work towards long term sustainability and conservation of sharks.

THIS PAGE: Researchers tag tiger sharks in Australian waters

Australian Tigers

After working with smaller sharks for a few years I set myself a new challenge- working with the mighty tiger shark. Reef sharks are strong, but being the largest tropical predatory shark, tigers are a whole new ballgame!

I was introduced to the Tigers at Raine Island during Undersea Explorer's scheduled trips to the Far Northern Great Barrier Reef. Raine Island in the remote Far Northern end of the Great Barrier Reef is famous as the world's largest turtle rookery. In November it has been known for more than 14,000 turtles to come ashore to nest here in just one night. Raine Island's impressive turtle aggregations are no secret to marine predators like the tiger shark. As the turtles come in to nest, the tigers come in to feed.

Very little is known about tiger shark behaviour and I wanted to find out just how far the tiger sharks were travelling to feast on the migrating sea turtles at Raine Island. To do this I needed to be able to track the sharks' movements and the best way to do that is from space. I needed somehow to attach a satellite tag to the dorsal fin of tiger sharks at Raine Island so that I could follow them once they left the island.

How?

The first hurdle was 'How?' My initial idea was just to up scale the existing technique. After all tigers are just big reef sharks. The saving grace to capturing an animal of this strength and size is the bizarre way that sharks behave once their tails are secured. Nobody really knows why, but the minute the tail is caught they stop swimming and lie relatively placidly in the water.

However until the moment that that tail is secured the shark is far from placid! Grabbing the tail of a thrashing three and a half meter shark is pretty difficult, especially as the power of the shark turns the water to foam and visibility becomes almost nil. The only way I could get hold of the tail was by jumping in the water with the sharks. I managed to catch four tiger sharks like this, but it was pretty frightening. Seeing the gaping mouth of serrated teeth over two foot wide suddenly materializing just inches from your face is an image that is not easily forgotten.

Not surprisingly the scientific community eventually decided that this method was too dangerous and quietly encouraged me to look in to safer options.

The Claw

After a year of development and testing I successfully used my new safer invention—The Shark Claw'. On the end of a long pole, the 'Claw' is designed to clamp on to the shark's tail. I attract the sharks using a floating bait. Approaching the bait in a small dive tender the tiger often comes over to investigate. The claw has to circle the peduncle in exactly the right place so timing has to be perfect. When we are close enough - I can grab the sharks tail using the 'Claw' without jumping in the water. The 'shark claw' is attached to a rope and large float which the shark drags through the water till it stops swimming. This new technique is much quicker and less stressful for both the animal and me.

Adam

The most recent tiger shark I have tagged was a 2.5 metre male, named 'Adam'. The satellite tag is attached to Adam's dorsal fin, where a salt water switch activates the tag every time the fin breaks the surface, allowing us to track her movements from space for months to come.

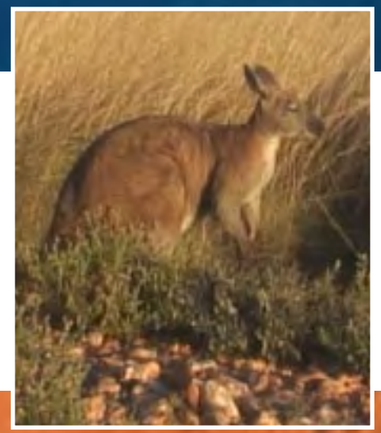
The satellite tags have revealed some fascinating new information about the lives of tiger sharks. We now know that they do cover huge distances after leav-

Queensland

Of course everybody has heard of the Great Barrier Reef and its numerous drop offs, coral atolls and coves. The waters here are home to 1500 species of fish alone in addition to thousands of different molluscs, crustaceans and other invertebrates. Further out in the Coral Sea the waters are even more pristine with visibility often exceeding 50 metres. The islands that are located on the Southern Great Barrier Reef are all surrounded by colourful coral reefs, pinnacles and clear turquoise water. Sail and dive around the well-known Whitsunday Islands. When on land you can watch turtles lying eggs or turtle eggs hatch, depending on the time of the year. Further down on the Sunshine cost the newly sunk wreck of the *HMAS Brisbane* has become a big attraction to divers. Brisbane also offers artificial reefs in Morton Bay or make your way to Morton Island and dive some wrecks. Plus you will find that Manta Rays pay regular visits to North Stradbroke Island. ■

Australian Tigers

Leave this type of encouter to the pros. Don't try this at home!



ing Raine Island travelling in all directions. For shark management this kind of information is essential to match the most appropriate conservation plans with the behaviour of the species. For most large migratory species like sharks current marine parks only cover small sections of their habitat. The shark data suggests that we must rethink and find more realistic methods to protect these ocean wanderers.

This research has been possible through the Undersea Explorer research program, Digital Dimensions, and CSIRO. To follow the shark research go to **www.sharkresearch.com** ■

Undersea Explorer Remote Far Northern Expedition – 7/8/9 day expeditions available Oct-Dec

Expeditions to Great Detached Reef, Raine Island, Mantis Reef and Wreck Bay near the top of Australia, with Richard Fitzpatrick as special guest scientist. Travelling to the Far Northern regions of the Great Barrier Reef will always be the pinnacle of extreme adventure diving. Australia's spring is the best time to dive the outer walls, offering a great chance of encounters with megafauna. Brydes Whales, Manta Rays and Whale Sharks and of course Tiger Sharks are all regular visitors to this region. Raine Island is the world's largest Green Turtle nesting site.During this expedition you'll experience the excitement of 3-4 superb dives per day in remote areas, drift dives and deep dives. Onboard activities range from informative presentations in the biologist room, 'creature feature' talks on the top deck, and barbecues on the top deck.Your panoramic flight to or from Lockhart River gives you the opportunity to view the vast wilderness of the Cape York coastline and reefs.In addition to our Far Northern Expeditions, Undersea Explorer also offers 6 day Osprey Reef Shark Encounters throughout the year, and 6 day Minke Whale Expeditions in Jun/Jul. Prices are from AU$2100 per person for a 6 day expedition including twin share cabins and all meals. Check our schedule on the web: **www.undersea.com.au/2007.htm** or call 61 7 4099 5911

YANN SAINT-YVES

New South Wales

SEAN PHILLIPSON - UNDERWATER.COM.AU

In the North, tropical and temperate currents meet and you can swim amongst Leopard Sharks in summer as well as loads of turtles, especially around Byron Bay. The critically endangered Grey Nurse Sharks, or Ragged Tooth sharks are resident in the southern part of the North Coast as well as further down the coast. Try the awesome cave dive at South West Rocks about half way down to Sydney. While there, don't just look at the opera house; Sydney's waters are surprisingly rich in marine life. Discover the rocky reefs and kelp beds teeming with life, such as Port Jackson sharks, Eastern Blue Gropers, Giant Cuttlefish, Weedy Seadragons and moray eels. South of Sydney offers anything from penetrable shipwrecks to diving with inquisitive Australian Fur Seals. ■

TRURINA COOK - UNDERWATER.COM.AU

Byron Bay

Where Tropical And Temperate Waters Merge

By Wandy and Tim Hochgrebe
Photos and video by Tim Hochgrebe

The township of Byron Bay lies on the east coast of the Australian continent, a mere two hours south of Brisbane and about nine hours north of Sydney. Byron Bay is quite well known for being the most easterly point of the Australian mainland and is home to the most powerful lighthouse in the southern hemisphere.

Known for the alternative lifestyle and friendly people, Byron Bay has grown into one of Australia's most popular holiday destinations for people wanting something more than beach alone.

The many cafes and the relaxed atmosphere put you in a holiday mood right away. For those seeking culture, nightlife and fine dining, Byron also has a lot to offer. Art exhibitions, gallery openings, fire dancing performances and plenty of live music are always on offer.

People do not only visit Byron Bay for its culture it also has some major natural attractions. One of them is the annual whale migration of the majestic Humpback Whale. Between May and October 5000 individuals make their way up North and back down to the Antarctica each year. Both land based whale watching and the close-up experience from boats has increased in popularity over the last few years.

Although Byron Bay is one of Australia's most popular holiday destinations, only few people realise the fantastic marine environment Byron Bay has to offer. This popular subtropical township renown for its beautiful beaches and stunning hinterland is part of the Cape Byron Marine Park and home to the Julian Rocks Marine Sanctuary.

School of Goatfish

Julian Rocks

Julian Rocks consists of ancient igneous rock, remains of a volcanic eruption more than 20 million years ago. It is an extension of Cape Byron separated by water and forms a most unique habitat, providing shelter and food for more than 500 tropical and temperate fish species alone. Boulders, sand gutters and trenches form a fantastic underwater landscape, coloured by sessile life such as sponges, hard and soft corals and tunicates.

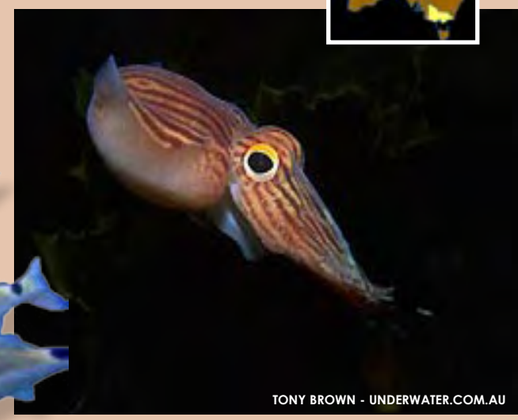
Since 1982, marine life has been protected to a certain extent through the creation of Julian Rocks Marine Reserve. This helped the emergence of a unique underwater Mecca for marine life at this rock formation only 2.5km off shore.

In December 2002 Julian Rocks became part of the Cape Byron Marine Park and in May 2006, the Marine Park zoning plan came into action, which amongst other things means that an area with a radius of 1500m around Julian Rocks has become a Sanctuary Zone for most of the year. This will hopefully see fish stocks increase even more and give the critically endangered Grey Nurse sharks, or Ragged Tooth sharks, some well deserved additional protection.

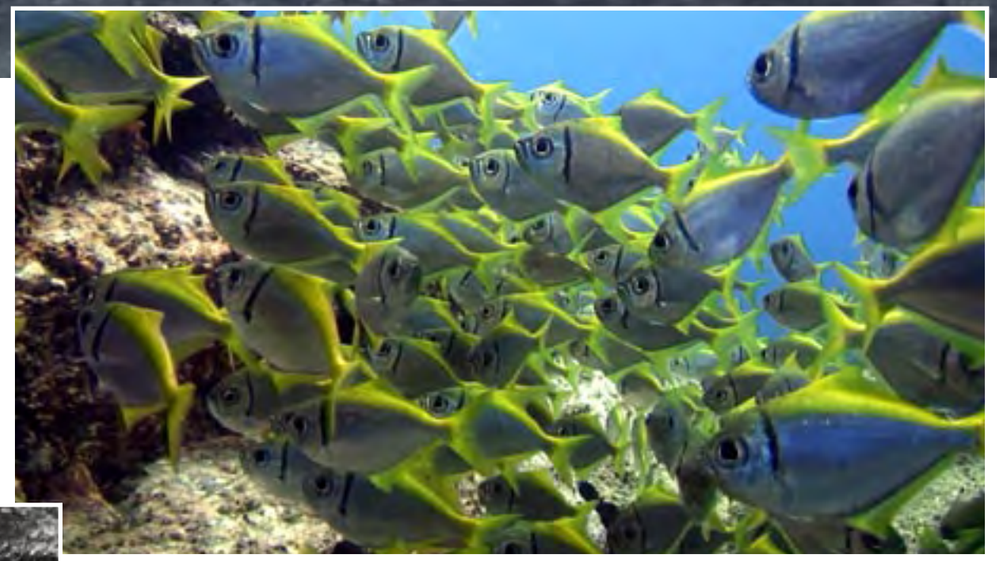
Even though Julian Rocks looks rather small, dive sites are plenty and its rocky reefs extend to Spot X, Mackeral Boulder and the Cape Pinnacles. Diving is pleasant all year round with temperatures ranging from 18˚ C in winter to 27˚ C in

Loggerhead sea turtle cruises the reef

Victoria



East of Melbourne. imagine a landscape made up from granite boulders, drop-offs and pinnacles, coloured by sessile growth. Yes, the water temperatures can drop to 12ƒC, but visibility can be up to 45 metres! Swim through kelp or past stunning sponge gardens. Melbourne itself is a big city with some great diving! Interact with Australian Fur Seals at the largest colony in southern Australia at Seal Rocks. Explore the wrecks of the J-Class submarines. West of Melbourne you find even more accessible shipwrecks. The Fiji, Schomberg and Loch Ard are located less than 10 metres deep. Explore the rocky reefs made up out of ledges, pinnacles and gutters, which are covered in sponges, zoanthids, bryozoans and kelp. ■



CLOCKWISE FROM TOP: Leopardshark displays dramatic markings and elegance in its streamlined form and fins; schooling reef fish; Brilliant red seastar

summer. Due to its sheltered location diving takes place almost every day of the year, with visibility ranging from 5 to 30 meters.

The marine environment around Byron Bay is quite unique as both tropical and temperate currents that flow past Julian Rocks contribute equally to the abundance and variety of marine life. With water temperatures and currents changing throughout the year there are many seasonal visitors. Every dive at Julian Rocks is different unlike diving on many coral reefs and many people return to this dive site on a very regular basis to experience it during different seasons and conditions.

Winter

The month of May, when water temperatures start to drop, marks the start of the Grey Nurse Shark season. These endangered and in NSW fully protected sharks are fantastic to encounter. Although these sharks look ferocious they are perfectly safe to dive with.

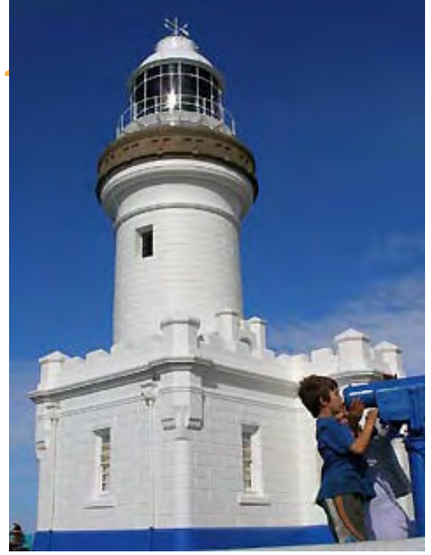
The Grey Nurse Sharks (*Carcharius taurus*), or Ragged Tooth Sharks, prefer the deeper waters and they often congregate in the sandy gutters on the North side of Julian Rocks at a depth of around twenty meters.

Through the 1950s and 60s these sharks were hunted to near extinction in Australian waters as they were wrongly believed to be man-eaters. With their total population estimated to be less than 500 the Grey Nurse Shark population on the East Coast of Australia is now considered Critically Endangered. Fortunately, Julian Rocks has been identified as one of thirteen Critical Habitats for Grey Nurse Sharks along the NSW coast. Some fishing and even dive behavioural guidelines were put in place in the hope this will increase the chance of survival of this species.

Spring

In spring when the water temperature starts rising, a variety of tropical species become more common around the rock and different kinds of butterfly fish, angelfish and surgeonfish dart around the coral outcrops that can be found in different places.

The juvenile Half-circled Angelfish (*Pomacanthus semicirculatus*) can be easily identified due to its bright blue colouring and white semi-circles on the side. Once it becomes an adult the rings disappear, but they are still stunning. Of the Surgeonfish the Blue Tang (*Paracanthurus hepatus*) must be the most noticeable one and juveniles can be found hovering just above table corals together with Headband Humbugs (*Dascyllus reticulatus*), ducking inside for cover as soon as anything approaches.



Byron Lighthouse was bulilt in 1901

Butterflyfish

The butterflyfish are less shy and are found mostly in pairs, nipping on coral polyps or grazing. The Threadfin, Vagabond and Dusky Butterflyfish (*Chaetodon auriga, C. vagabundus* and *C. flavirostris*) are some of the species common at Julian Rocks. By the way, don't cross into the territory of the Girdled Scalyfin (*Parma unifasciata*) as those little farmers are fierce in protecting their algae patches.

Of course everybody knows the anemonefish, which live in symbiosis with their anemone. At Julian Rocks a number of different species can be encountered, the most common ones being the Barrier Reef Anemonefish (*Amphoprion akindynos*) and the Blue-lip Anemonefish (*Amphiprion latezonatus*).

Around mid December the anemonefish start laying their bright orange eggs. Interestingly, the eggs are cared for mainly by the male, which can be found fanning the egg mass with their fins, providing its offspring with oxygen rich water. Hatching generally occurs after a period of 6 to 10 days.

It is at this time that the large stingrays arrive. Black Stingrays (*Dasyatis thetidis*), the Cowtail Stingray (*Pastinachus sephen*) and the Smooth Stingray (*Dasyatis brevicaudata*) can be seen on most dives. With their huge wingspan of almost two meters or more they are a quite impressive sight.

Summer

As the water temperature starts to reach its maximum in early January, Leopard Sharks (*Stegatosoma fasciatum*) aggregate at Julian Rocks.

Very little is known about these prehistoric looking and mysterious sharks. They mainly lie together in small groups on sandy patches and can be easily recognised by their round forehead, pale skin with leopard-like spots and their characteristic tail.

Leopard sharks are egg-laying sharks, but no egg cases have ever been found near Julian Rocks. Much of the biology of the leopard shark is still unknown including where the individuals found at Julian Rocks go in winter and whether the same animals return to the few known aggregation sites each year.

As the water begins to cool in early May the Leopard Sharks simply disappear from Julian Rocks. Manta Rays visit Julian Rocks on occasion, however the end of summer and early autumn seems to be their preferred time of the year.

Byron Bay

ABOVE: Red Morwong. BELOW: Manta Ray

MAXI ECKES. UNDERWATER.COM.AU

Other Sharks and Rays

The most commonly observed shark around Julian Rocks is the wobbegong shark. Three different species have now been identified and they are present all year round.

The Dwarf Ornate Wobbegong only grows to one metre and is the smallest species. It is observed regularly in the shallower waters, draped over a sponge or table coral. The larger Ornate Wobbegongs are not as common in this area as the other two species. It has only just recently been decided that this is a separate species from the Dwarf Ornate Wobbegongs and they can grow up to

Around mid December the anemonefish start laying their bright orange eggs. Interestingly, the eggs are cared for mainly by the male, RIGHT: Frog, Planula

Tasmania

ERITH ISLAND'S WEST COAST ANCHORAGE. PHOTO: GARY MYORS

Travel south and discover Tasmania's rocky reefs in clear water. Do not miss the famous Kelp Forests and immerse yourself in this completely different world with a myriad of species, such as seahorses, crabs, stingarees and Weedy Seadragons. Explore the off shore islands and swim amongst wrecks that have been there over a 100 years. These waters are rich in nutrients and without even trying you will find rock lobsters, abalone, leatherjackets, perch, handfish and morwong. ■

three metres in length.

The similar looking Spotted Wobbegong can be distinguished from the Ornate Wobbegongs by its colour patterns, which consist of broad dark saddles and the distinct circles formed of groupings of small white dots. Most of the time the wobbegongs lay at the bottom and feeding occurs mainly at night. Their prey includes fish, crayfish, crabs and octopus.

Closely related to the sharks are the rays, most of which are regulars at Julian Rocks. Although the Blue Spotted Stingray (*Dasyatis kuhlii*) is believed to be a solitary species, these rays seem particularly active in summer and can be found in the shallows, piling on top of each other in the sand. Hundreds of Blue Spotted Stingrays can be observed in very tight groups in the same area, usually in early to mid January which could be interpreted as mating behaviour.

Electric

Another ray species seems to have found a meeting place at Julian Rocks as well. The Numbfish (*Hypnos monopterygium*), also called Electric Ray, becomes visible in higher numbers during the beginning of autumn in March. Normally they bury themselves in the sand and wait for their prey to swim past, but during this time they actively swim around in the shallows. This behaviour has been observed during the same weeks of the year for many years at Julian Rocks and has not been reported elsewhere.

These odd-looking rays have specialized muscles located on their back which can generate a significant electric current (50 amps, with peak of pulses sometimes exceeding 1 kilowatt). Not only does the Numbfish use this to stun their prey; it can also seriously deter any predators.

Julian Rocks' reefs are also home to the White-spotted Eagle Rays (*Aetobatus narinari*), the Sparsely Spotted Stingaree (*Urolophus paucimaculatus*), the Eastern Fiddler Ray (*Trygonorrhina fasciata*), the Eastern Shovelnose Ray (*Apytychotrema rostrata*), the Giant Guitarfish (*Rhynchobatus djiddensis*) and very occasionally the Southern Eagle Ray (*Myliobatis australis*). And if you are very lucky you can witness spectacular schools of up to 200 Cow-nose Rays (*Rhinoptera neglecta*) that sometimes pass by Julian Rocks.

Most of the time the wobbegongs lay at the bottom and feeding occurs mainly at night. Their prey includes fish, crayfish, crabs and octopus.

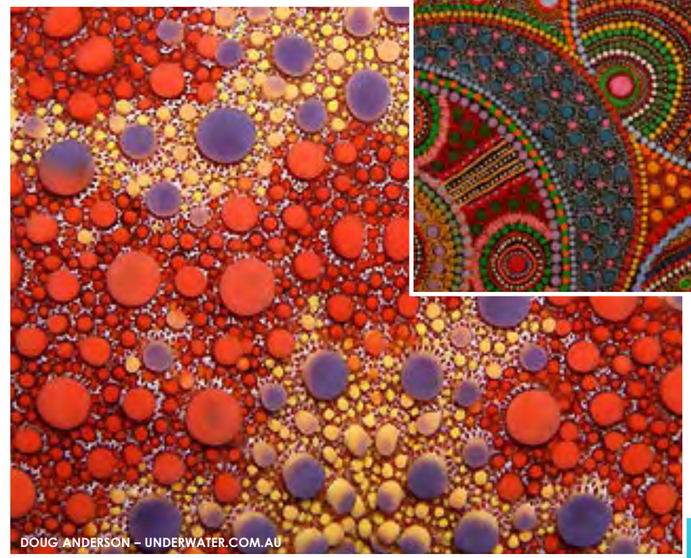
Marine Turtles

One of the big attractions when visiting Julian Rocks must be the friendly sea turtles that live here. Julian Rocks is home to three different species: the Green Turtle (*Chelonia mydas*), the loggerhead turtle (*Caretta caretta*) and the Hawksbill Turtle (*Eretmochelys imbricata*).

All three marine turtle species are currently experiencing serious threats to their survival.

Not many people know that adult Green Turtles are unique among sea turtles in

Byron Bay



Art resembles nature or nature resembles art... ABOVE: Traditional dot on dot technique used by Aboriginal artists to create vibrant designs. LEFT: Close up of a seastar BELOW: Diver greets Leapardshark. (image from Fido Reef)
BOTTOM IMAGES: Wobbegongs

that they have a completely vegetarian diet and feed on seagrasses and algae, whereas Hawksbill Turtles feed mainly on invertebrates like sea squirts and anemones.

Most divers know that Loggerhead Turtles can reach enormous sizes. One very large Loggerhead seems to call Julian Rocks its home. Its size indicates that it must have been around for a long time! The lifespan of a Loggerhead turtle is estimated to be 50 years or more and adults grow to an average weight of about 100 kilos. Equipped with powerful jaws they can crush crabs and molluscs and even the spines of a sea urchin are no defence.

Even though turtles are very much at home underwater they are in fact reptiles and need to go the surface to breathe. During resting periods they can stay submerge for long periods of time. If they become more active they will need to return to the surface more often—which is why turtles are very commonly seen by snorkellers. Julian Rocks therefore not only attracts divers, many people that have never ever snorkelled in their life come out here to swim and snorkel with turtles… and some of them will turn into divers eventually

Blue Groper

Cephalopods

The rocky reef provides an ideal habitat for many Cephalopods—literally meaning head-footers—which include octopus, cuttlefish and squid.

Several species of octopus have been sighted on the reefs around Julian Rocks. Generally shy creatures these invertebrates prefer to crawl into their burrow when they feel threatened, holding shell fragments and rubble in front of them.

The cuttlefish around Julian Rocks can be found hovering just above the ocean floor, and usually move around in pairs

When cuttlefish feel threatened they initially might try to blend in with their surroundings and almost disappear from sight. They are true masters of camouflage. If approached too close for comfort they will try to make themselves look as large as possible by extending their arms and rapidly flashing colours are displayed often as a warning.

Another member of the cephalopods, the squid, is seen around Julian Rocks only occasionally.

Like the other cephalopods they use a specialised foot called a siphon, which enables them to hunt and escape quickly by expelling water under pressure.

Pelagics and Predators

Marine life does not only come to find shelter at Julian Rocks, food is abundant here attracting schools of streamlined predators. Pelagic hunters such as Mulloway (*Argyrosomus japonicus*) and Yellowtail Kingfish (*Seriola lalandi*) are fast swimmers that can be found regularly in the deeper waters around Julian Rocks. Other pelagics include Big-eye Trevally or Jacks, as well as Golden and Blue-fin Trevally.

Occasionally barracudas pay a visit to the rocky reefs and can be seen in small schools out in the blue.

Hunting closer to the reef are the spectacular lionfish. Several species are observed in this area including the Common Lionfish (*Pterois volitans*), the Dwarf Lionfish (*Dendrochirus brachypterus*) and the Spotfin Lionfish (*Pterois antennata*). It is common diver knowledge that Lionfish have extremely venomous dorsal fin spines, but they are generally not dangerous to approach.

Detail of a sea anemone

Dusky Flathead

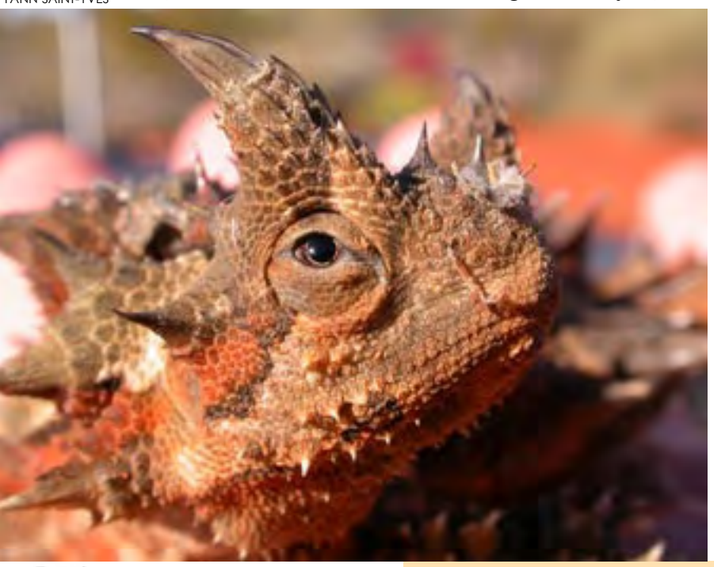
Lionfish prey on a wide variety of smaller fishes, shrimps and crabs. They have few predators in their native range. Their prey, which is hunted mainly at night is obtained with a lightning quick snap of the jaws and swallowed whole.

Several species of moray can be found at Julian Rocks, including the Abbot's Moray (*Gymnothorax eurostus*), the White-eyed Moray (*Siderea thyrsoidea*), the Green Moray (*Gymnothorax prasinus*), the Mosaic Moray (*Enchelycore ramose*) and the Sieve-pattern Moray (*Gymnothorax cribroris*)

Moray eels can look quite fearsome, as their mouths are equipped with razor sharp teeth. The wide open jaws are generally not a sign of aggression, the gape is necessary for respiration as water has to be actively pumped across the gills. During the day most morays are found in crevices and holes affording protection from predators and allowing them to strike at prey from a hidden position.

Besides the animals mentioned already there is plenty more to see such as the playful Blue Gropers, bullseyes, fusiliers, Old Wives, Harlequin Ghost Pipefish, Pineapplefish hiding under ledges, Sergeant Majors, Barred Soapfish, cowry shells, a variety of brightly coloured nudibranchs, and plenty of other molluscs, crayfish and an array of smaller crustaceans. Sometimes there are so many fish you can hardly see where you are going.

YANN SAINT-YVES



Thorny Devil, *Moloch horridus*

Byron Bay and Julian Rocks offer a unique environment that celebrates and nurtures diversity, abundance and colour and is considered one of Australia's top 10 dive sites – and of course our number ONE.

In addition to the amazing wildlife that can be encountered at Julian Rocks, this diving site also has the advantage that it is only a short boat ride from the shore. You can do up to four dives a day, but it is also possible to do just one or two; leaving plenty of time to relax and enjoy Byron Bay or explore the surrounding national parks and villages.

Diving is done on a small scale and there are only two dive shops in town, which ensures that the dive sites are never crowded.

Getting there

Apart from the obvious driving there, there are two airports nearby: one at Ballina (20 minutes south) and one at Coolangatta - Gold Coast (40 minutes north). Regular flights from all Australian capitals and some international flights into Coolangatta. Shuttle busses from Brisbane airport for those from further afield. More info from Planula Divers Retreat – **www.planula.com.au.** Please view videoclips to this story at **www.byronunderwater.com** ■

Hydroid bearing reproductive polyps and hosting a family of Amphipods

Red Indianfish

Time to chill at Bondi Beach

Sydney Harbour

Text by Richard Vevers and photos by George Evatt

Diving in Sydney is like drinking beer, it can take a while to get used to but once you get the taste for it, you're hooked for life. It can be cold, it can have poor clarity, but you'll be hard pushed to find anywhere in the world with such great diving a stones through from your office in the city.

Australia is renowned for its tropical diving: seeing Nemo on the Great Barrier Reef, schools of sharks in the Coral Sea, manta rays and the majestic whale shark on Ningaloo Reef, so it is not surprising that the diving in cooler waters goes largely unnoticed. Especially diving in a major city, which is rarely a priority for divers.

Yet the temperate waters of Australia boast one of the most diverse marine ecosystems in the world—an amazing underwater world that few ever explore—Sydney is at its heart. There are over twice as many species in the harbour within sight of its famous Harbour than in the entire British Isles.

The secret behind Sydney's, marine life is its proximity to the continental shelf, bringing with it nutrient rich water and a vast array of visitors including several tropical species caught up in the East Australian Current coming down from the Great Barrier Reef.

Bondi Beach epitomises the diving in Sydney. Visited by millions of people each year, it is arguably the world's most famous beach. A beautiful surfing beach, within 15 minutes of the city centre, it is home to the oldest surf lifesaving club in the world. However, despite its high profile, only a handful of people ever check out what lies beneath the waves.

Bondi Beach has become world famous as a surfing beach because of it's accessibility, so why isn't its diving equally famous? It certainly has the marine life to justify it. A typical example is the Weedy Seadragon—one of the world's most amazing creatures. Growing up to 45cm, it is related to the seahorse, but as its name suggests, it looks like a dragon, complete with blue stripes and yellow spots. How can a dragon living on the world's most famous beach not be famous itself? The fact is, even the majority of locals don't know it exists. In virtually any other country, everyone would be aware of this beautiful creature, but Australia is so spoilt with incredible wildlife that it gets ignored.

Despite their bizarre appearance, Weedy Seadragons are actually pretty difficult to spot. There are only about 20 at Bondi Beach and they blend in perfectly with the kelp—which seems completely ridiculous after you spot one and then consider how brightly coloured they are.

Even if you don't get to see the Weedy Seadragon on a dive at Bondi, there's no shortage of other bizarre life to look at. The giant cuttlefish is a favourite. Its ability to change shape and colour in an instant is impressive on its smaller cousins, but when you are faced with a group of cuttlefish all over a metre in length, imitating their sur-

CLOCKWISE: Polyp, Diver spots red coral, Mosaic Leatherjacket, Sydney Opera. INSET: Old Wives

South Australia

The area west of Adelaide is well known for the appearance of the magnificent Great White Shark, King of the Sea, Predator Extraordinaire. This experience is not for the faint hearted or the impatient. Luckily, there are other sites to safely dive amongst encrusted pylons, rocky reefs and sponge gardens, harbouring cephalopods, seahorses, spidercrabs, the Leafy Seadragons and soft corals. Visit Whyalla where huge numbers of the Giant Cuttlefish aggregate to mate and spawn. Just off Adelaide discover history and dive the *HMAS Hobart*, which now lies upright at a depth of 30 metres. Kangaroo Island, just off shore from Adelaide, offers plenty of opportunity to find the Leafy Seadragon. In the state's east, discover diving with a difference and plunge into the fresh water lakes, sinkholes, cave and caverns at Mount Gambier. Besides the thrill there is also some life in the crystal clear lakes such as yabbies, eels, lobsters, and pygmy perch. ■

Bondi Beach

CLOCKWISE FROM FAR LEFT: Sydney Bridge; Anemonefish guarding anemone; Stargazer; Sydney Opera House at night

roundings as the swell takes them from sand to rock, the image is mesmerizing.

The Wobbegong, a three-metre Carpet shark, aptly named for its ability to look and act like a kitch 1970 carpet is another local favourite. It lies on the bottom motionless until an unsuspecting diver swims too close and is shocked to suddenly see the seafloor bust into action.

Other marine life seen regularly at Bondi Beach include piles of a dozen or more Port Jackson sharks having their afternoon siesta (a shark that can't bite you but can give you a nasty sting from its horn), large bull rays, fiddler rays, octopus, schools of squid and the large sex-changing, bright blue grouper that follows you around like a puppy. Then there are the balls of stripped catfish that you can swim through (if you dare—their poison never leaves your body if stung), the large schools of salmon tuna and kingfish that form a perfect barrel around divers, brightly coloured nudibranchs, big red stonefish… the list goes on. They all live a few hundred metres from the 35,000 oblivious topless sun-worshippers on this famous strip of sand.

Diving in Sydney surprises virtually everyone

However, Bondi is not even considered the best shore dive site in Sydney—there are many other contenders. The more popular sites include Shelly Beach and Fairlight in the northern beaches, Camp Cove and Gordon's Bay on the eastern harbour foreshores, Bare Island—a small island on the northern foreshore of Botany Bay—and Shiprock, in Port Hacking.

Manly, the other great surfing beach of Sydney, like Bondi is also typical of Sydney's amazing marine life. Ten metres off the crowded harbour beach, in three metres of water, lives a colony of 200 seahorses on the man-made shark nets. Tell anyone on the beach about them and they'll think you're crazy.

Frogfish

Bare Island is a personal favourite—one of the most scenic shore dives. It has many of the same species as Bondi but with a few stunning additions including the red indian fish that looks exactly like a red indian chief and the elusive blue devil fish that never ceases to amaze divers. They live in a surreal landscape consisting of bright orange and pink sponge.

Although the shore diving is excellent, sometimes it is great to get on one of the dive boats in Sydney and get out to some of the other dive sites. Almost all of the 30 odd dive facilities either own, or have on permanent charter, a dive boat—capable of carrying anywhere between six to twelve divers. Whales and dolphins are regular visitors to Sydney and frequently appear alongside dive boats and even the occasional giant sunfish makes a trip in close to shore.

One of the most popular boat dive sites is Magic Point—a fabulous dive that starts off at a large amphitheatre with an overhang that goes back under the cliff. This is where the endangered Grey Nurse Sharks cruise by. There are only approximately 500 of these sharks left in Australia and you feel very privileged to be able to get up close and personal to these harmless rare large sharks.

Sydney is the oldest settled city in Australia and its coastline and waterways are littered with wrecks of every description; some the result of maritime misfortune and others that have been purposely scuttled. In Sydney Harbour alone there are more than twenty-five known wrecks and offshore there are an even greater number. Although many of these vessels lie in water depths only accessible to technical divers, others are in shallower waters just metres from shore.

One of the most popular is the *Coolooli*—a large wreck scuttled off Long Reef. An old bucket dredge that now lies on her side on a sand bed in 48 metres off long reef. This dive has something for everyone and begins at 36 metres. The wrecks superstructure is intact and it is possible to penetrate various areas. For the more adventurous, you can swim through the funnel and come out through a hole in its side.

Diving in Sydney surprises virtually everyone. Once you get used to the colder water (16 to 24°C) and the lower visibility than the tropical diving up north, you'll find the experience unique. The sheer diversity of life in the temperate waters means that there are always new things to discover. In fact, despite being in a major city, even in the harbour there are new species waiting to be discovered and named.

For more information, please contact Richard Vevers at: ***www.underwateraustralia.com.au*** ■

Tasmania
Bound For Adventure

Text by Gary Myors
Photos by Baron and Gary Myors
and Karen Gowlett-Holmes

One look at the prognostic weather chart told me that we would not sail on schedule. The forecast was for 30 knot north-westerlies with gusts to 45 knots throughout the night and for the next 24 hours.

Our destination, the Kent Group of islands, was north west of our departure point, Inspection Head at the mouth of the Tamar River in northern Tasmania. The vessel of the brigantine *Windeward Bound* had taken aboard a motley crew organized by Christian Bell, the Tasmanian Co-ordinator of the Marine and Coastal Community Network. We had eight divers out of a full complement of twenty four, twenty five if you counted Oscar the ships dog.

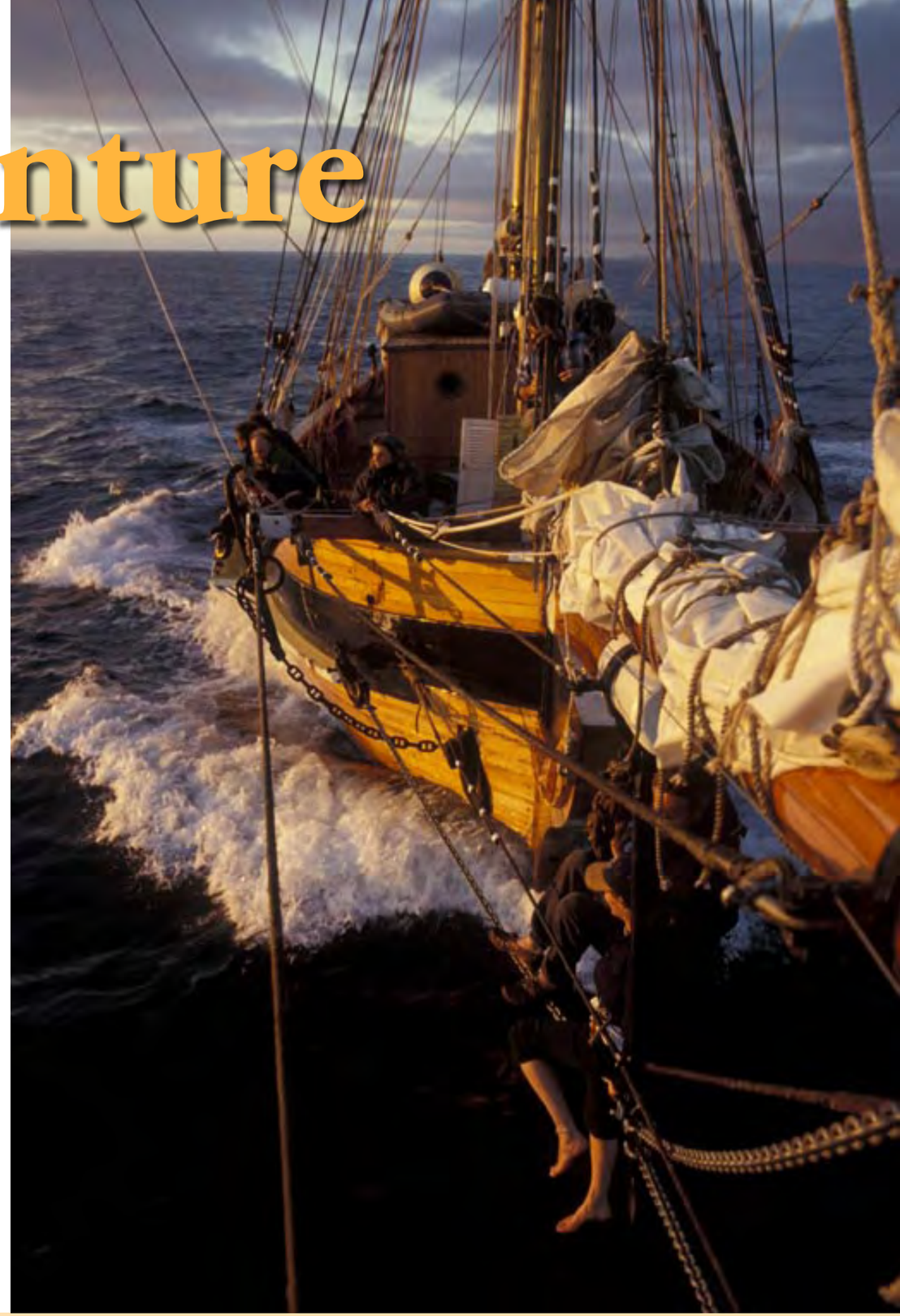
The aim of the voyage from my point of view was to video and photograph as much of the marine life and historic ship wrecks as possible to help with the creation of the Kent Group Marine Reserve.

Nudibranch graces the dark coral reef
LEFT: Traveling to the Kent Group Marine Reserve the old world way aboard the wooden brigatine *Windeward Bound*

We threw off the lines late the next afternoon and motored to the mouth of the Tamar and into Bass Strait. The wind was still a gusty 25 knots from the North West but was forecast to swing west, then South West hopefully giving us ideal sailing conditions early next day. We were divided into groups under the supervision of the experienced crew to stand watch during the journey. Many of the new crew and some of the old fell victim to the poor sea conditions, which the skipper Brian Parry-Adams rated, by chunder factor. My watch was the middle watch from midnight to 0400 and it was an experience that I'll remember forever.

The moon was nearly full and on the bow, bathing the ship and the heaving sea in silver light for all of my four hours at the helm on the opened quarter deck. The clear cold sky and the fresh wind that combined with the natural light show made standing at the helm pass rapidly. I became aware for the first time in many years of just how insignificant we are when nature chooses to display her charms. All too soon it was time to crawl back into my warm bunk and catch some sleep.

Several hours later, I re-emerged to find the wind had changed and the square sails had been set creating a new feeling to replace the magic of the wild night with a superb morning with ideal sailing conditions. Several of those who



Engraving of the *SS Bulli* in its glory days

Tasmania

to make an effort in case the weather deteriorated in coming days. We had two small inflatables aboard and we assembled the smaller of the two first. It was able to deliver us one at a time onto the wreck, which sits upright on a sandy bottom in about 17 metres of water.

The *SS Bulli* laden with coal and bound for Launceston had taken shelter from heavy southerly weather on the afternoon of the 28th June 1877. The weather cleared that evening and the master of the vessel recommenced his journey.

Unfortunately, the vessel struck rocks near NE Island and was forced to return to West Cove. The crew tried to save the ship by throwing the cargo overboard this however failed and the ship was abandoned. The crew of 26 landed on Erith Island and later with the help of the lighthouse keeper, signaled a passing New Zealand steamship the *SS Tararua* which rescued the crew and transported them to Melbourne.

The wreck is marked on all current charts and being 180 feet (54 metres)

LEFT: Anthropod

ABOVE: Erith Island's West Cove anchorage

LEFT INSET: View of the stern of the wreck of the *SS Bulli*

hadn't been able to crawl from their bunks to take turn on watch began to appear green faced into the fresh air as the weather mellowed and our destination materialized on the horizon. Almost 24 hours to the minute since departing Inspection Head, the anchor plunged through the glassy surface of West Cove on Erith Island.

Steamship *Bulli*

This vantage point was most suitable from my point of view as the wreck of the steamship *Bulli* was only 50 metres from us and although almost sunset Mick Baron, Graham Collins and I decided to gear up and go for it. My theory was that we were already one full day behind and needed

'The DVD 'BYRON UNDERWATER - where tropical and temperate waters merge' is now available from **www.underwater.com.au**

Filmed by Tim Hochgrebe
Edited by Andrew Bambach
Directed and produced by PLANULA and In Your Face Productions
Soundtrack by Simon Perroni (former DO3) and Bhakta. Release date: 10 December 2006. DVD: 58 minutes, full narration, multi region PAL format

Take a marine journey through the seasons of Byron Bay to encounter an amazing kaleidoscope of life with the latest DVD release from Planula Productions and In Your Face Productions. Byron Bay is unique and reknowned for its increadible diversity and abundance of marine life caused by its water temperatures and currents changing throughout the year.

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> Neville Coleman

On the reel, you'll see mating octopus, hunting wobbegongs, massive schools of pelagic fish such as kingfish, mulloways and trevallies. Nature celebrates in astonishing abundance of life at Julian Rocks where tropical and temperate currents converge, to form this unique environment. Over 1000 dives and hundreds of hours of film over six years went into this production.

The DVD 'Byron Underwater - where tropical and temperater waters merge' is now available at **underwater.com.au** FREE SHIPPING WORLDWIDE offer good from now until end of 2006. Extra features: Byron Underwater—a musical journey, Cape Byron Marine Park zoning plan, Marine Passions DVD trailer. ■

Shipwreck of the *Karitane*

long is easy to locate as its shape is visible from the surface. The current in the area is strong and inexperienced divers should be supervised carefully. The ship is extemely photogenic; the stern makes a wonderful silhouette. The interior forward of the boilers is stunning with some of the most colorful invertebrate life in the region. I did three dives on the *Bulli* and still didn't get all the video footage I would have liked.

The next morning, Mick and I decided to dive on the southwest corner of Deal Island near a place we called Indian Head. This was a deep wall dive that took us to 35 metres. It was another of those dives that, should the chance arise, I would not hesitate to repeat. Clouds of Butterfly Perch swarmed around us almost blocking out the sun on some occasions. Several Old Wives, a big bull seal and spectacular invertebrate life kept us spellbound for nearly 40 minutes. Our fear of being swept away in the current that passes through Murray Passage was unfounded although Stuart Lennox, our boat watch, had trouble finding us. Eventually, we were retrieved and returned to the ship none the worse for wear.

Tasmania

ABOVE: Strange forms of a Ctenophor
LEFT: Schooling fish hover over a garden of sponges and corals

SS Karitane

Thursday's plan was diving another historic ship wreck, the 1,376 ton *SS Karitane*.

The *SS Karitane* was bound for Port Kembla and Sydney in December 1921. She carried copper ingots from Mount Lyell mine, timber from Burnie and produce from Devonport. While steaming across Bass Strait, she encountered thick fog and crashed into the rocky headland on the southeast corner of Deal Island. Captain Spain assessed the damage and chose to beach the vessel in Squally Cove about two miles from where she first struck.

We moved the *Windeward Bound* to Squally Cove on the south side of Deal Island and located the wreck easily, as part of the bow is visible on the shore. Originally 247 feet (73m) in length, the remains of the ship lies with the stern in 12 to 15 metres of water and can be seen easily from the surface of the clear water. Unfortunately, the vessel was blown to bits by the enthusiastic salvors led by the Johno Johnstone (of *Niagra Gold* fame). The ship has very little in the way of artifacts as it has had a pretty good going over since 1921 and is shallow enough to allow snorkellers to dive most of it easily. From the boilers to the stern is the most photogenic area with the stern laying starboard side down on a sandy bottom. If you want good photos, warn the other divers to stay off the bottom as the sand stirs up very quickly.

This is a dive for all levels of diver if there is no swell. Just remember that the weather can change very quickly and make returning to a safe anchorage difficult. The fish life around the wreck was inspirational and includes species that are not found further south plus many others that are not found further north. It

The fantastic fronds of a Lionsmane jellyfish

Tasmania

The crew of the *Windward Bound* enjoy a moment over the waves

was a real mixing pot and offered many great photo and video opportunities.

Owing to a later than normal first dive and the necessity to move the *Windeward Bound* back to West Cove on Erith Island, four of us elected to do a night dive in the sea grass bed near the anchorage. For me, this was a disaster of a dive with first my video light failing, then my video battery going flat. There were many interesting night critters to see and just having the lights and camera strobes firing made the whole scene seem like something out of the X-Files. At one stage, while under the ship, I noticed that the mast head and deck lights cast a silhouette of the whole ship onto the sandy bottom. The masts and people walking on deck cast their shimmering ghost-like shadows down through the clear mill pond calm water. It was a dream like feeling as we sank towards the bottom and focused on the job of finding the small creatures of the night.

Port Jackson shark

I rose early on Friday to see and photograph the sunrise and wasn't disappointed by the dazzling light show provided by the location and the vessel. The main dive of the day was to be another deep one this time on the north-east side of Erith Island, which was more or less just around the corner from where our ship lay.

This was another awesome dive Mick and I followed the almost barren bottom down to 33 metres and along the sand edge into a world of brilliantly colored encrusting corals, sponges and thousands of fish. All too soon we had to leave this amazing dive site and head up into reality for a deco and safety stop. This was not as bad as it sounds as far as deco stops go as the fish life, including a good size Port Jackson Shark, kept us occupied

Free swimming anemones

Gary Myors with Port Jackson shark

KAREN GOWLETT-HOLMES

A carpet of golden Zoanthids bloom on red sponge

Graceful pink jellyfish dances in the deep

KAREN GOWLETT-HOLMES

for the remainder of our dive.

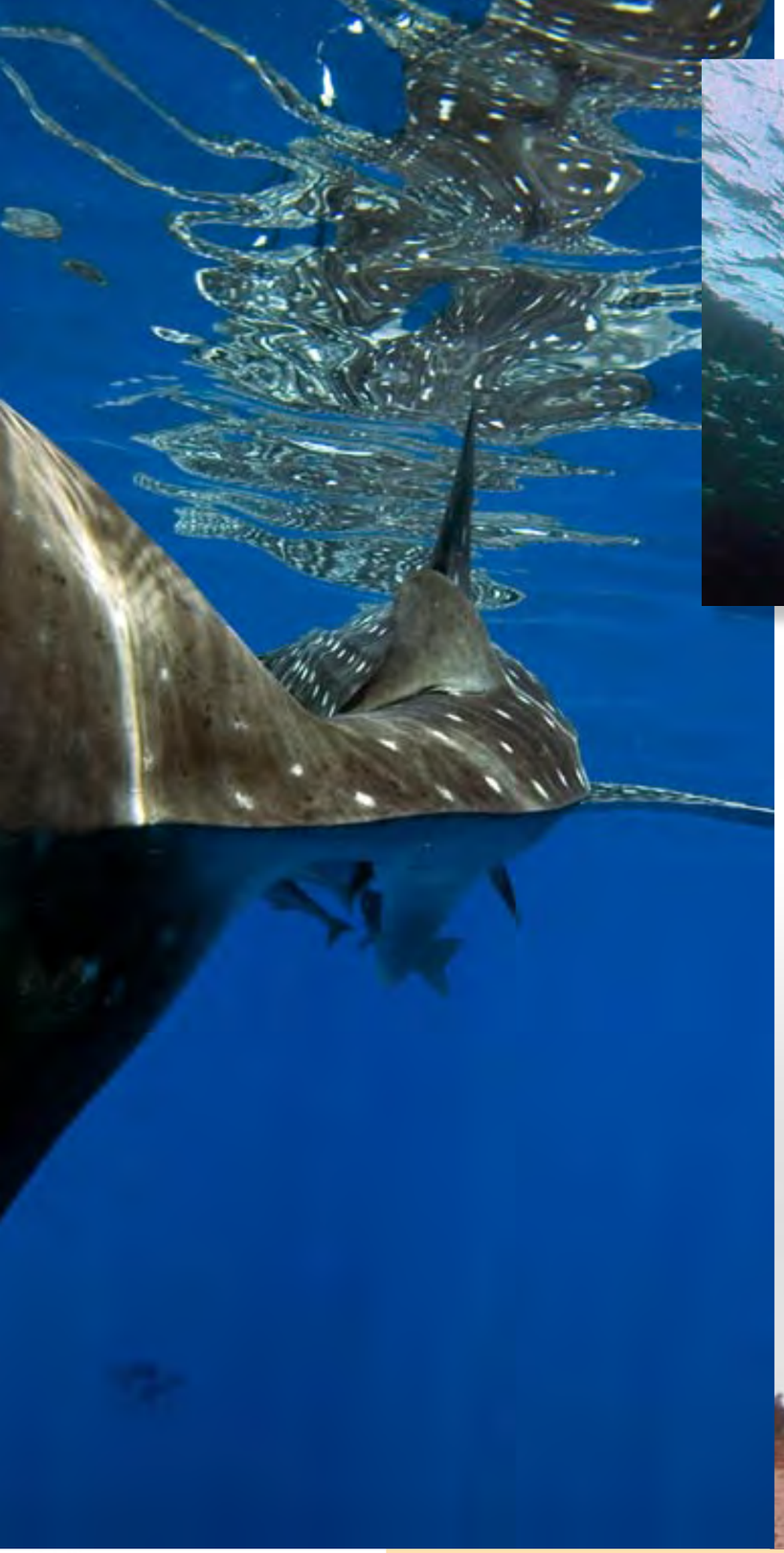
This was our last night at Erith Island and first light on Saturday morning saw us circumnavigating Deal Island to catch the beautiful soft morning light on the eastern side of the island. Then off to the west to Judgement Rock seal colony. While most of the divers had a swim with the seals, I shot some top-side footage from the rubber duck and Mick did the diving. Then it was back to the business of heading home. The return trip overnight to the mouth of the Tamar River was uneventful and very pleasant if not a little sad. We had made some very strong friendships, done some world class diving, and had a week the likes of which usually happen only in adventure documentaries.

New Marine Reserve

As a result of the work done on this expedition and following work by Christian Bell from MCCN the Tasmanian Government made the announcement in 2005 declaring the Kent Group of Islands a Tasmanian marine reserve.

It is our hope that we will return to Bass Strait to continue the saga and broaden our knowledge of the dive sites in this magnificent group of islands. ■

A garden of sponges and soft corals decorates the reef



CLOCKWISE FROM LEFT: Tail end of the whaleshark; Divers try to keep up with a whaleshark; Underwater photographer encounters schooling fish; The ubiquitous emu in the desert

Western Australia

Text and photos by Paul and Kelly Waghorn

Divers the world over can be divided into two groups, those who would like to visit Exmouth and Ningaloo Reef and those who would like to go back there. Of course, this could be said of hundreds of highly promoted, well managed tropical diving destinations offering resort facilities, reliable diving conditions and top notch service, and herein lays the difference. Exmouth is remote, facilities are basic and conditions are unpredictable, however the marine life is abundant, the reef is highly accessible and the area is largely pristine. Ningaloo Reef is a place where divers can experience a diverse range of depths, marine life, topography and visibility and patronise genuinely local operators who can customize diving packages based on experience, budget and seasonal diving conditions. Exmouth is not a place where divers can expect exciting nightlife, shopping or a large selection of restaurants. The allure lays in the rich, natural resources of the region, which are currently under consideration for World Heritage Listing, most significantly Ningaloo Reef!

Ningaloo

Traditionally Ningaloo Reef has been referred to as having a 'season', being somewhere between April and July. This is largely due to the desire of many visitors to coincide their visit with the presence of Whale Sharks which visit Ningaloo to feed during these months. The weather during this period is generally considered milder and more bearable, particularly for European travellers who find the 40°C days, common through the summer months, unbearable. However, the preference for the 'season' is becoming less obvious as more visitors arrive to take advantage of the less busy months, where the chance for a beach or dive site to oneself becomes more likely. Diving is great all year round, as long as divers are prepared to be flexible and make choices based on conditions and local knowledge provided by local operators and internet weather forecasts. The word is also out that whale sharks aren't the only reliable 'big' animal at Ningaloo.

Options for diving Ningaloo Reef from Exmouth span several locations. Not all can be dived at all times of the year and are heavily dependent on wind, swell, currents and tides, all of which the Ningaloo Reef are at the mercy of. However, due to Exmouth's location of the North West Cape peninsula, at least

The Ningaloo calendar

November- January:
Turtles mating in the Shallows and nesting in the evenings. Sharks mating and nursing in shallows. (Good diving unless cyclone)

February- March:
Baby turtles hatching, baby sharks in shallows. (Good Diving unless cyclone)

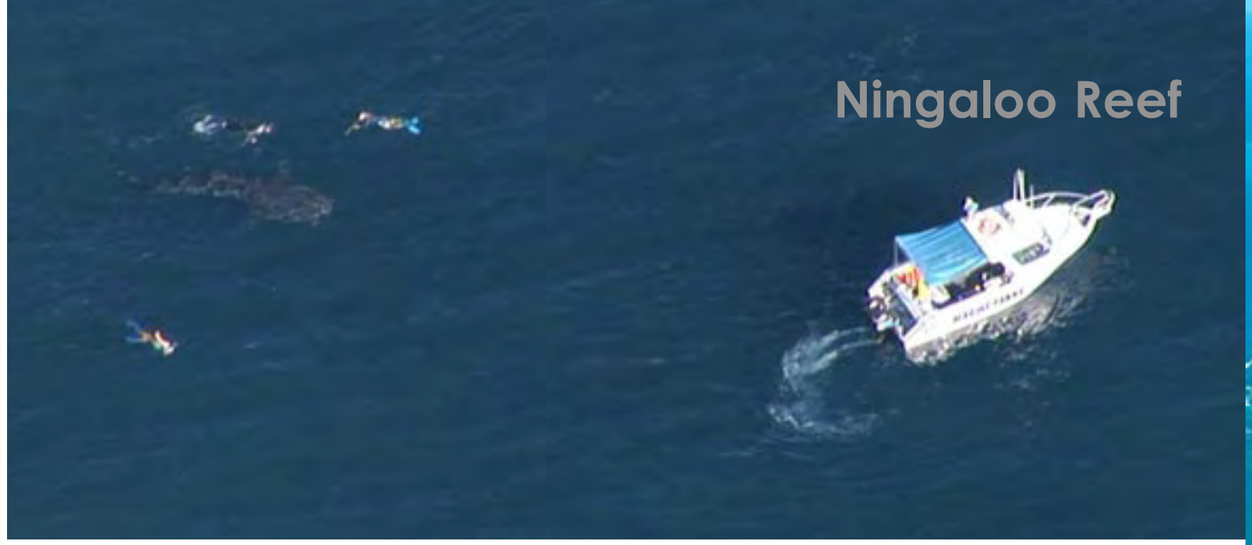
March- July:
Whale Sharks on West Coast

June- July:
Manta Rays feeding/ cleaning on West Coast

June- August:
Humpback Whales West Coast

August- November:
Humpbacks in Gulf

Pilot Whales, Minke Whales, dolphins, dugongs, manta rays, orcas and other 'big' animals appear sporadically throughout the year to the delight of divers and crew- anything can happen on Ningaloo Reef!



one side is partially protected from the prevailing conditions. In a perfect world, divers could visit each location during their stay, but the reality is that their money and time underwater are better spent by working with the conditions. This may well be the reason divers come back time and time again, in the hope that the Indian Ocean will allow them access to visit a different, wondrous part of Ningaloo Reef of each visit. And given time it will…

The following is a brief description of each of the areas of Ningaloo Reef accessible to divers from Exmouth. Unfortunately, even if conditions are conducive to diving the more remote areas, often operators won't deviate from their local 'cattle truck run' due to expenses, logistics and time. However, the discerning diver with a few Aussie dollars to play with will always find an operator willing to negotiate a private, customised charter.

Nudibranch

Lighthouse Bay Referred to as 'Local Reef Diving' by operators, is a 30 min boat trip from the boat ramp at Bundegi Beach. This is considered the 'bread and butter' diving of Exmouth due to close proximity, reliable marine life sightings, numerous dive sites, and shallow depths. Dive sites include 'Blizzard Ridge', the Labyrinth, Gulliver's, Eldorado's and the Fish Hole. These are huge limestone outcrops, which appear like oases in the sand, attracting thousands of fish of all sizes and regular appearances of sea snakes, turtles, manta rays, sharks and colourful nudibranchs. Most of the dive sites here are in an easy 8-15m depth, and allow for long, relaxing dives and great light and colour.

West Coast

The West coast is where the actual exposed; fringing reef runs parallels to impossibly white sandy beaches, whose shores are protected by the shallow inner lagoon. The Whale Sharks congregate on the west coast, feeding on the nutrient rich waters during 'the season' and there are opportunities to dive both inside and outside of the lagoon. The deeper water outside the back of the reef has some interesting country, ranging from steep walls to huge overhangs and swim thrus in15- 25. At certain times of the year, these swim thrus fill up with glass fish creating 'bait cracks'. The bait cracks attract all types of pelagic fish, schools of Trevally, Rankin cod, sharks, snapper and bull rays. The outcrops are also permanent homes to huge sea turtles, friendly potato cod and lazy wobbegong sharks. Unfortunately big, constant swells limit the number of clear days on the west coast, but there is some deeper ground that has more reliable visibility although notable less life. The inside of the reef also delivers some great diving to those that can overcome their contempt for shallow diving. The lagoon has a maximum depth of 9m and has provides great snorkelling opportunities, however the advantage of being on SCUBA and being able to remain sub-

COUNTERCLOCKWISE FROM TOP LEFT: Snorkelers swim with a whale shark; the islands of Ningaloo Reef; Gaping jaws of a whale shark

COUNTER CLOCKWISE FROM LEFT: The sea splits a gorge into the rocky desert plateau; Guitarfish with remoras and cleaner wrasses; Octopus on reef

merged allows for excellent light filled photos with brilliant colour. Life includes chevron barracuda, lagoon rays, schools of puffer fish, colourful reef fish and even a dugong slinking by.

Muiron Islands

For most divers, the term Island conjures an image of lush green palm trees stretching towards sheltered clear water, fringed by shallow coral reef. The Muiron Islands are a little different. Pronounced 'Myoo- rons', these Islands are recognised as the most Northern boundary of the Ningaloo Marine Park. The Islands take around 50mins to reach from Exmouth and the crossing is not always appealing to divers susceptible to seasickness.

Once at the Islands, there is usually somewhere sheltered to dive, however conditions are unpredictable and heavily affected by wind, swell and current. Visibility is rarely exceptional at the islands, due to the constant movement and the powder find sand of the seafloor being constantly tossed into the water column. Seasickness and poor visibility aside, the Islands do provide an awesome opportunity to explore some wild country. The strong currents make this an ideal place for soft coral s and sponges to live and the colourful gardens stretch out as far as football fields. There are swim thrus that wind from 5m to 12m and some BIG pelagics! Kamikaze mackerel and tuna fly overhead, while curious manta rays inspect divers' bubbles. Lazy nurse sharks rest in caves and BIG cod appear from nowhere. The Islands are a place for BIG things and the best piece of advice here is to look up! Unfortunately the Muiron Islands have experienced significant fishing pressure over the years and stories of huge cod feeding frenzies and bommies choc full of jumbo crayfish are becoming harder to believe. Unfortunately, this is also the reason why local diving operators have declined marine park management offers to install moorings at heavily dived locations. The reasoning is that for the small amount of coral destroyed by anchor damage, leaving the dive sites unmarked will minimise the loss of fish life from the area.

Bundegi Reef

Bundegi Reef is the "get out of jail card' for local operators, although ask any Exmouth locals and dive crew and they will tell you that it is one of THE most underrated dive sites of Exmouth and no less spectacular that the Eastern sites on the Muiron Islands. Bundegi reef is recognised by coral reef scientists as having

Ningaloo Reef

Western Australia

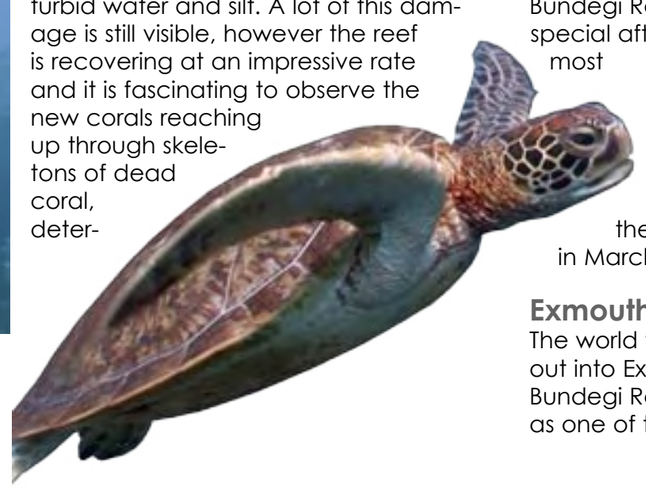
The North West of Western Australia is remote, but you can experience an untouched coral habitat that is visited by less than 200 divers a year—the Rowley Shoals! Imagine 400-meter drop offs, diving while surrounded by wrasse, other colourful fish and schools of pelagics such as mackerel, tuna and trevally. Further down is Ningaloo Reef, which is just as spectacular as the Great Barrier Reef and offers an impressive combination of marine life, such as Dugongs, aggregation of Whalesharks and schools of Manta Rays. Around Perth you will find magnificent Marine Parks with a mixture of tropical and temperate marine life. Just south of Perth, limestone reefs have formed an astounding underwater landscape with swim-throughs and caves. Access Rottnest Island from here and explore the whole range of dive sites available. Further down, you can't miss to dive Busselton Jetty as well as a few awesome wrecks including the *Swan* and the *Lena*. Still considered Australia but really much closer to Indonesia, are the exotic Christmas and Cocos Islands. Envision yourself in a tropical paradise with nothing else to worry about other than floating weightless amongst colourful fish and corals. ■

Exmouth Navy Pier


MEGHAN STEUDLER – UNDERWATER.COM.AU

TOP TO BOTTOM: Diver peers through a school of reef fish; Abundant soft coral decorate the reef housing numerous reef fish species; Bannerfish and reef fish; Sea turtle chases jellyfish

one of the highest coral recruitment rates in the world and has been deemed a productivity hotspot. This is hardly surprising as it is nestled between the nutrient rich Exmouth Gulf, (the lifeblood of the area) and the Ningaloo Reef. The dives here a shallow and need to be timed for slack tide or executed as a drifts. When category five cyclone Vance hit Exmouth Gulf in 1999, a lot of the coral here died either as a direct result of being pounded by storm surge or being smothered by the turbid water and silt. A lot of this damage is still visible, however the reef is recovering at an impressive rate and it is fascinating to observe the new corals reaching up through skeletons of dead coral, determined to return Bundegi reef to its former glory. The larger boulder corals which survived the cyclone are like huge apartment blocks, filled with fish and animals at every level. Bundegi reef is "busy" with fish. Reef sharks, turtles, sweetlips, coral trout and Spanish flag can be found loitering amongst the bommies and manta rays will glide past later in the year. Bottom scratchers enjoy diving Bundegi reef due to never ending species of nudi branchs which crawl past as well as triton shells, flatworms, sponge crabs and other critters. Although night diving isn't offered by most operators in Exmouth, Bundegi Reef offer's something special after dark action- most notably the coral spawning which occurs, seven to ten days after the first full moon in March.



Exmouth Navy Pier

The world famous Navy Pier stretches out into Exmouth Gulf and is next door to Bundegi Reef. The Pier has been rated as one of the top ten dive sites in the Australia and one of the top ten Pier dives in the world- and with good reason! The pier has been closed to fishing for a number of years all the life has been left to grow and breed. As a result, the water beneath the Pier is filled to the brim with fish of all sizes and species. The max depth is around 10m, providing an easy dive and allowing plenty of bottom time. Entries are from the shore or a giant stride from a platform and dives need to be made during the window of slack tide. Due to tidal movement, visibility on the Pier is rarely exceptional, however the trade of is that the sheer abundance of life requires the diver to look little more than 5m for the next breathtaking sight! Despite low visibility the dive is easy to navigate and is a photographer's dream, with life everywhere and seemingly unafraid of divers. Huge, curious estuarine cod follow the groups of divers over the top of wobbegong and white tip sharks sleeping on the bottom. Sea snakes wind through the coral encrusted pylons and frog fish stare out from the discarded piping which litters the sea floor. Thousands of trevally swim laps close to the surface and elegant lionfish hang suspended in the water column and most divers exit the pier completely exhilarated and

Northern Territory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Not very well know for its diving but it is definitely worth it to check out the wrecks scattered in Darwin harbour, remains of a Japanese air raid in 1942. Find an abundance of reef fish darting around trucks, rifles and a Harley Davidson. Take a trip out to the Fenton Patches Artificial Reef with it reefs formed by tires, confiscated Chinese fishing vessels, bus stop shelters, barges and concrete pipes now harbouring tropical reef fish and schools of Jewfish. North of the Gove Peninsula you can find Barramundi, turtles, Whalesharks, Manta Rays, Trevally and Barracuda. ■


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The Great Barrier Reef in a nutshell

Text by Michael Arvelund, PhD

(SOURCE: THE AUSTRALIAN GOVERNMENT; DEPARTMENT OF THE ENVIRONMENT AND HERITAGE. SEE ALSO: WWW.DEH.GOV.AU/HERITAGE/WORLD-HERITAGE/SITES/GBR/VALUES.HTML)

The Great Barrier Reef, one of Australia's first World Heritage Areas, was inscribed on the World Heritage List in recognition of its outstanding natural universal values:

- as an outstanding example representing the major stages in the earth's evolutionary history;
- as an outstanding example representing significant ongoing ecological and biological processes;
- as an example of superlative natural phenomena; and
- containing important and significant habitats for in situ conservation of biological diversity.

It is the world's largest World Heritage Area extending 2,000 kilometres and covering an area of 35 million hectares on the north-east continental shelf of Australia. Bigger than the entire area of Italy, it is probably the best known marine protected area in the world. The Great Barrier Reef's great diversity reflects the maturity of the ecosystem, which has evolved over hundreds of thousands of years. It is the world's most extensive coral reef system and is one of the world's richest areas in terms of faunal diversity.

School of Big Eye Trevally

The Great Barrier Reef World Heritage Area contains more than just coral reefs. It also contains extensive areas of seagrass, mangrove, soft bottom communities and island communities. Contrary to popular belief, the reef is not a continuous barrier, but a broken maze of coral reefs and coral cays. It includes some 2,800 individual reefs, of which 760 are fringing reefs. These reefs range in size from less than one hectare to more than 100,000 hectares, and in shape from flat platform reefs to elongated ribbon reefs.

The Great Barrier Reef provides habitats for many diverse forms of marine life. There are an estimated 1500 species of fish and more than 300 species of hard, reef-building corals. More than 4,000 mollusc species and over 400 species of sponges have been identified.

Other well-represented animal groups include anemones, marine worms, crustaceans (prawns, crabs etc.) and echinoderms (starfish, sea urchins etc.). The extensive seagrass beds are an important feeding ground for the dugong, a mammal species internationally listed as endangered. The reef also supports a wide variety of fleshy algae that are heavily grazed by turtles, fish, sea urchins and molluscs. The reef contains nesting grounds of world significance for the endangered green and loggerhead turtles. It is also a breeding area for humpback whales, which come from the Antarctic to give birth to their young in the warm waters.

The islands and cays support several hundred bird species, many of which have breeding colonies there. Reef herons, osprey, pelicans, frigate birds, sea eagles and shearwaters are among the numerous sea birds that have been recorded.

(CONTINUED ON PAGE 52) ►

Whale watching, anyone?

Breaching Humpback Whale

determined to dive it again. Night dives on the pier are equally amazing and are offered to advanced divers when tides are conducive.

Ningaloo is exposed, unpredictable and pristine. It is one of the few places with world where you can visit and dive the exact same dive site three dives in a row and see something different on each. It is a place where you can sit at 14m and just 'be' with a turtle, or share a cleaning station with a manta ray three meters across and weighing 700kgs.

Come during the winter and you are virtually guaranteed to encounter the biggest fish on earth

Come during the winter and you are virtually guaranteed to encounter the biggest fish on earth. Come during the summer and observe a sea turtle orgy.

Divers around the world come back here because Ningaloo gets under their skin. They are seduced by the red dirt and turquoise sea, the casual and aloof nature of both the local people and marine life. They come back because there is nothing plastic, micro managed, strategically marketed or consumer driven about Ningaloo. The life is there and the diving speaks for itself. No five stars, no performance, just a box of chocolates- you never know what you're gonna get!

Wags and Kelly live, work and breath the Ningaloo Reef. They have dived and filmed the reef extensively and their high definition footage has appeared in documentaries, DVDs and on televison around the world. Their passion is for educating people about the underwater world and nurturing a love and respect for the ocean. They have produced several underwater DVDs and continue to add to their archive year after year as Ningaloo Reef continues to surprise and delight them with new creatures and behavious year after year. They are highly active in assisting local researchers with whale sharks, turtles and other marine life and vocal on local conservation issues arisng on Ningaloo Reef. They also run their own small diving charters for experienced divers and are sought after by film crews and professionals to help capture the best of Ningaloo Reef.

More pictures on Ningaloo reef can be found here: ***www.ningalooreefteach.com/pictures/page1.htm***

To contact Wags and Kelly, please visit ***hdvunderwater.com*** ■

Serene azure waters at Heron beach

A Taste of the Cocos (Keeling) Islands

For many, this question still arises: "Where the heck is the Cocos (Keeling) Islands?" and more than likely they proceed to look for Cocos in the Pacific Ocean. WRONG! Now I have to confess, I am one of those geographically challenged people. After grabbing the ever trusty and very dusty atlas that had been deeply buried since school days and after much searching, I found this tiny speck in the middle of the Indian Ocean.

COUNTER CLOCKWISE FROM ABOVE: Divers explore the reef around the Cocos Islands; fan corals and lacey soft corals grace the ledges of the reef; An octopus stands on its arms in an upward stretch

Text and photos by Karen Wilshaw

Still not sure where it is? Well, draw a line from Perth in Western Australia to Sri Lanka and then a horizontal line from Darwin and where the two lines meet is approximately where this tiny horseshoe shaped atoll is located. By the way, Charles Darwin visited the Cocos (Keeling) Islands in 1836 aboard the *HMS Beagle,* and it was during this visit that he developed his theory of atoll formation. He spent some time exploring the southern atoll and also visited the northern atoll some 24km further away. In his publication on coral reefs in 1842, he was the first to propose the theory of reef formation and evolution, building on his discovery of coralline fossils in inland areas and in mountains earlier in the journey and his visit to the islands. That theory, which is still held as valid, explains the dynamics of the three principal categories of coral formation.

Before moving to Cocos, I was a non-diver. So, after a few months of being land-locked, it became obvious that I really needed to learn to dive. That was nearly seven years ago. My open water sessions were conducted in pool-like conditions at Direction Island, one of the most beautiful islands in the atoll. Here, whilst taking my first fin strokes and learning to trust the reg, endless schools of small fish came in close to investigate this clumsy noisy bubble blowing human. My first 18-metre dive was conducted at the Cabbage Patch, and this is the first "taste of Cocos" I am going to share.

The Cabbage Patch is one of my favourite dives and I suppose, as it was my first experience seeing the extraordinary colours the underwater world has, it remains etched for life. Huge stands of pristine golden and green *Turbinaria reniformis*, Cabbage or Salad corals, adorn the steep drop-off. It covers an area well over 500 metres square and is home to a myriad of fish life. Thousands of Goldenback Anthias (*Pseudoanthias evansi*) and Ternate Chromis (*Chromis ternatensis*) use the leafy formation of this hard coral as their refuge. When the sunlight hits the anthias and the cabbage coral, it literally glows golden. With a blue water background, it really is an unbelievable sight.

The corals end around a depth of 18 metres. From there, the scenery changes to a rocky substrate before ending on a pure white sandy beach adorned with red whip corals. Indian Ocean Bannerfish and Golden Damselfish appear to have

ABOVE: Dugong. TOP CENTER: Dugong and dolphins. LEFT INSET: Coral reef fish

This little guy has its eggs lined up on an old strand of wire coral and is very photogenic and extremely co-operative while he protectively guards his eggs. It's just one of the many fish friends I like to check on regularly to see what has changed in the family.

Returning towards the boat at a shallower depth, the enormity of the Cabbage Patch becomes apparent. It truly is a spectacular dive site with its most amazing marine inhabitants.

The Ski Run, as the name suggests, truly looks like a ski slope, falling gently at first to get your confidence before it drops steeply into an endless abyss. It's another favourite for the photographer, as this is critter heaven. Here, you can spend weeks and never really see all of what it has to offer. There are bombies dotted here and there that have treasures of marine life that I am only just beginning to discover. Dotted over the snow-like slopes, the bombies are covered in soft leather corals, porities, Lobophyllia and delicate sea ferns. Within these bombies, with their many hidey-holes are Durban Dancing Shrimps (*Rhynchocinetes durbanensis*), Yellow-margin Morays, Juvenile Emperor Angelfish, nudibranchs and thousands of tiny glassfish just to name some of the marine life. During my last dive, our dive group discovered three different species of tiny pipefish and an indescribable tiny see-through shrimp.

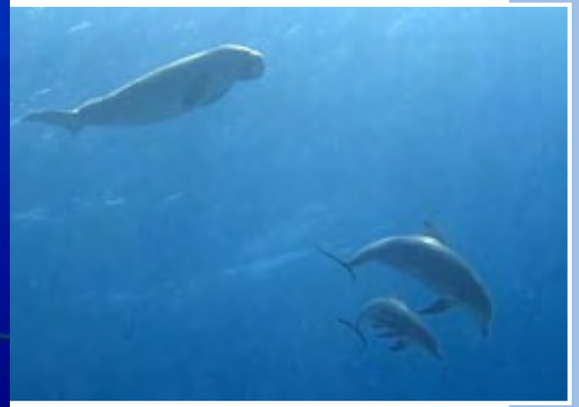
Each time I go to the Ski Run, I rarely fail to see octopus and usually it's not just one, but several. They are amazing to watch, particularly when hunting with the scavenger mates, the Bluefin Trevally or Goatfish.

claimed these whips as their piece of paradise. Travelling slowly along the slope, the coral comes to an end and opens up to a lovely white sandy chute—home to hundreds of curious and shy Spotted Garden Eels (*Heteroconger hassi*). Great to watch, hard to photograph successfully. Whitetip Reef sharks are often found sleeping on the sand—now these are great to capture digitally as they tend to allow you a close encounter before slowly moving off.

Just a little further along the corals change to another greenish hard coral, *Porites rus*, a prostrate type of coral with fingerlike formations. Here, I like to visit a very friendly Golden Damselfish.

Lizardfish

Cocos Islands



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(THE GREAT BARRIER REEF, CONTINUED FROM PAGE 50)

The World Heritage property is also of cultural importance, containing many middens and other archaeological sites of Aboriginal or Torres Strait Islander origin. Some notable examples occur on Lizard and Hinchinbrook Islands, and on Stanley, Cliff and Clack Islands where there are spectacular galleries of rock paintings.There are over 30 historic shipwrecks in the area, and on the islands are ruins and operating lighthouses that are of cultural and historical significance.

About 98 per cent of the World Heritage Property is within the Great Barrier Reef Marine Park, the remainder being Queensland waters and islands. The Great Barrier Reef Marine Park was declared in 1975 with the purpose of preserving the area's outstanding biodiversity whilst providing for reasonable use. This has been achieved using a spectrum of zones ranging from General Use Zones to Preservation Zones. In very broad terms, these zones allow ecologically sustainable activities, but all have an overriding conservation objective. Most reasonable activities such as tourism, fishing, boating, diving and research are permitted to occur but are controlled through zoning and management planning to minimise impacts and conflicts with areas of high conservation value and other users.

Today, the great majority of the Marine Park is still relatively pristine when compared with coral reef systems elsewhere in the world. An independent report published in 1997 concluded that the Reef is in good condition and is being managed effectively. These are also the findings of two major workshops to which over 100 scientists and management experts contributed. Both these workshops have now been summarised in the report titled State of the Great Barrier Reef World Heritage Area 1998, released in November 1998.

FIONA LIGNUM - UNDERWATER.COM.AU

The Australian Government and State Government have a cooperative and integrated approach to management of the Great Barrier Reef World Heritage Area. The Great Barrier Reef Marine Park Authority (GBRMPA) is the Australian Government agency responsible for overall management, and the Queensland Government, particularly the Queensland Parks and Wildlife Service, provides day-to-day management to the Authority. Integrated management is also assisted by: a Commonwealth Act specifically for the Marine Park that, if necessary, provides over-riding powers; complementary legislation for most adjoining State waters; formal agreements with Queensland, and with various government departments, industry, research institutions and universities; and strategic zoning plans and site-specific management plans.

GBRMPA's current work program stems from four issues that have been identified as being critical for achieving adequate protection and management of the Reef in the short to medium term: water quality and coastal development; fisheries; tourism and recreation; and conservation, biodiversity and world heritage.

Further reading

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Cocos Islands

CLOCKWISE FROM TOP LEFT: A pair of Trapezia crabs share a shelter in the hard coral; Fusiliers school in a blue mass; Blacktip sharks slither along a shallow bed of a lagoon

I can spend hours with these guys (and sometimes my entire dive is with the occy's). Once they realise you aren't going to interfere, they happily allow you to accompany them on their hunt.

But, I must move on from the shallows. If you are a deep dive junky, then the Ski Run can cater for you as well. Heading down the kiddies' slope, the terrain drops sharply into a steep canyon with beautiful healthy stands of Gorgonian Fans and Whip Corals adorning its sides. And it is here at around 35 metres (and sometimes deeper) a very unique angelfish is found, the Ornate Angelfish (*Genacanthus bellus*). Rarely seen, let alone photographed, these gorgeous fish have the most tenacious character, swimming towards you most defiantly before taking cover under one of the ledges. I have only seen the females and can only assume the males are around somewhere. However, the female's unusual markings and colouration is most beautiful. Obviously, at these depths, bottom time runs out pretty quickly. However, as most of the smaller bombies and their hidden treasures are at 10 metres and shallower, you can spend heaps of time off gassing whilst exploring.

The Cabbage Patch and Ski Run are just a miniscule taste of diving on the Cocos (Keeling) Islands. There are over 30 regularly dived sites and hundreds more to discover. I haven't even mentioned the mantas, sharks, dolphins, turtles, tuna and barracuda that are regularly seen, or the unusual and gentle dugong, Kat, who made Cocos his home some 4 years ago. The diving is extremely diverse and caters to the majority of divers, whatever their interest.

Crowds are not an issue as Cocos Dive is the only dive operator. Between their two vessels, *Putri Laut* and *Sayap Kecil*, the maximum number of divers they cater to is sixteen, with preferred numbers from four to ten.

For more information contact: Dieter Gerhard, Cocos Dive, at tel. +61 8 9162 6515, www.**cocosdive.com** or email **scuba@cocosdive.com** ■

The Vanishing Dragon

Text by Carly Maple

When cameraman Brenton Dean first approached me a few years ago, about writing a wildlife documentary script that would tell the life ecology of leafy sea dragons, I thought, "an entire hour on the one sea creature?" That would absolutely bore people to sleep right?! I had only just got my scuba diving ticket and my diving experience was little to none. The leafy sea dragon is the state marine emblem in South Australia, where we both live and our filming production company; 'Abyss Pictures' is based. And the thought of filming a creature in our own backyard was something that I thought really wouldn't interest many, especially an entire documentary on what is, the larger cousin of a sea horse. But 4 years later, the completion of the documentary that we would come to name, "The Vanishing Dragon," would be seen and heard by more people than we ever anticipated and even begun to imagine. Having screened twice already Australia wide on the National Nine Network, to now being distributed internationally by National Geographic, it seems the entire world has a fascination with one of our biggest secrets downunder. This is an insight into the documentary on leafy sea dragons…

LEFT: Close up of the lacey countanance of the Leafy Sea Dragon
BOTTOM CENTER: Close encounter with a dragon

Vanishing Dragon DVD

"The Vanishing Dragon" (a winner at the Japan Wildlife Film Festival 2005) is a visually spectacular 52' wildlife documentary based on perhaps the most camouflaged of all ocean creatures; the leafy sea dragon. Unique to the rugged and fierce coastline of Southern Australia, the delicate leafy sea dragon resides. In order to survive in such a hostile environment, the leafy sea dragon relies completely in its ability to mimic a piece of seaweed. The leafy appendages placed on the head and body of the sea dragon mean that it can perfectly blend into its own environment.

For scuba divers, the chance of seeing one of these 'medieval' creatures in the wild, is to travel to the southern coastline of Australia. One of the dragon's most favourite of homes is under Rapid Bay Jetty situated on the Fleurieu Peninsula in South Australia. Under this particular jetty there are known to be over 30 breeding pairs and another 15 individuals that haven't yet paired up for mating. Because of their tremendous ability to camouflage, the leafy sea dragon is hard to find. Not to mention, they all look the same. The only way to tell one individual from another, is to take a close up photo of their head and compare it to other photos the white markings on their face and snout, are just like finger prints and are unique to each and every dragon.

In terms of sexing dragons, the easiest way to tell is during breeding season. The leafy sea dragon belongs to the *Syngnathidae* family, and just like its cousins, the weedy sea dragon, seahorse and pipefish, it's the male that has the extraordinary role in reproduction. After a courting dance that can continue up to weeks at a time, it's the male that will eventually fall pregnant once the female has deposited around 250 eggs onto his tail. For the next 5-6 weeks, the father will spend his time buried deep in the thick kelp meadows of the ocean floor and protect his young relentlessly from predators. Eventually the father will give birth and the eggs will drop.

Sadly, only 5% of the newborn will survive to reach maturity of 2 years of age. Once born, the tiny cm long dragons are highly susceptible to predators. But surprisingly, these predators are not the biggest threat to the species. The sea grass loss along the southern coastline of Australia is astounding. Effluent disposal and stormwater run off have been killing off the sea grass along this coastline for years. The degradation of sea grass not only affects the leafy sea dragon, but is the initial feeding ground for all creatures that live in the ocean. All sea creatures rely on it.

The underwater world makes up over two thirds of our planet. To preserve this world and the creatures that live in it, means the sea grass must flourish like it once did before. This is a story about a dragon that symbolises all of these creatures and is told by those who know it best. Prepare to lose yourself in a beautifully shot film and learn more about a dragon so majestic in nature and appearance… the vanishing dragon.

The making of...

"The Vanishing Dragon" took well over a year to completely research and write. Little has been recorded about these creatures, and information is very hard to find. The only way to properly research them was to visit them and study their behaviour in their own environment. The documentary reveals information, which has never been recorded before. For example, the incubation period… it was believed that leafy sea dragons took only 4-6 weeks to hatch the eggs. But this isn't the case. The male carries the eggs for a period of about 7-8 weeks, and as the eggs begin to turn a ripe purple, he drops them all in 24-48 hour period. But the eggs don't just drop off, he aids in the babies hatching by shaking his tail, causing the eggs to jiggle. Also, he rubs his tail gently against seaweed and rocks as an aid in dislodging them. Such information as this, has been corrected and the documentary is full with new and exciting information and footage.

Cameraman and Producer, Brenton Dean, spent summer after summer under Rapid Bay Jetty in South Australia attempting to capture the breeding and the egg transfer in the wild. He has been following one pregnant male leafy sea dragon in particular over the eight week course of incubation. This is the only recording ever, of a male leafy sea dragon giving birth in the wild.

"The Vanishing Dragon" DVD is available for purchase from ***underwater.com.au*** ■

fact file

Australia

▼ Map of Australia

ÁKOS LUMNITZER - UNDERWATER.COM.AU

Delicate spiral forms of the Christmas worm. INSET: Tiger anemones

History About 40,000 years ago, aboriginal settlers arrived on the continent from Southeast Asia. In the 17th century, the first Europeans began exploration. Formal territorial claims were first made in 1770, when Capt. James Cook took possession of the land in the name of Great Britain. In the late 18th and 19th centuries, six colonies were created which federated and became the Commonwealth of Australia in 1901. Rich in natural resources, the new country began to rapidly develop agricultural and manufacturing industries. The country made a major contribution to the British effort in World Wars I and II. During the past century, Australia has transformed itself into an advanced, internationally competitive market economy. Due in large part to economic reforms in the 1980s, the country boasted one of the OECD's fastest growing economies during the 1990s. Long-term concerns include pollution, ozone layer depletion, and conservation and management of coastal areas, especially the Great Barrier Reef. Government: federal parliamentary democracy. Capital: Canberra

Geography Located in Oceania, Australia is a continent between the Indian Ocean and the South Pacific Ocean. It is made up of six states and two territories: Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia. It has several dependent areas including Ashmore and Cartier Islands, Christmas Island, Cocos (Keeling) Islands, Coral Sea Islands, Heard Island and McDonald Islands, Norfolk Island, Macquarie Island. It is the world's smallest continent but sixth-largest country with a majority of the population concentrated along the eastern and southeastern coasts. Perth, on the west coast, is affected by the invigorating tropical sea breeze known as the "Fremantle Doctor". It is one of the most consistent winds in the world. Coastline: 25,760km. Terrain: mostly low plateau with deserts and fertile plains in southeast. Lowest point: Lake Eyre,15m. Highest point: Mount Kosciuszko 2,229m

Climate is generally arid to semi-arid. It is temperate in south and east and tropical in north.Natural hazards: cyclones along the coast, severe droughts and forest fires. Environmental issues: industrial development, urbanization, soil erosion from overgrazing and poor farming practices, rising soil salinity due to the use of poor quality water, desertification. Clearing for agriculture threatens natural habitats of many unique plant and animal species. The Great Barrier Reef off the northeast coast is the largest coral reef in the world and is threatened by increased shipping and its tourism. There are limited natural fresh water resources.

Economy A Western-style capitalist economy with a per capita GDP on par with the four dominant West European economies keeps Australia economically competitive. What's fueling the economy? Rising domestic output, robust consumer and business confidence and rising exports of agricultural products and raw materials. Key factors include low inflation, Australia's emphasis on reforms and growing ties with China. However, drought, weak foreign demand, and strong import demand inflated the trade deficit from $8 billion in 2002 to $17 billion in 2005. But Conservative fiscal policies maintain Australia's budget in surplus from 2002 to 2005. Natural resources: bauxite, coal, iron ore, copper, tin, gold, silver, uranium, nickel, tungsten, mineral sands, lead, zinc, diamonds, natural gas, petroleum. Agriculture: wheat, barley, sugarcane, fruits, cattle, sheep, poultry. Industry: mining, industrial and transportation equipment, food processing, chemicals, steel

Population 20,264,082 (July 2006 est.). Ethnic groups: Caucasian 92%, Asian 7%, aboriginal and other groups1%. Religions: Catholic 26.4%, Anglican 20.5%, other Christian 20.5%, Buddhist 1.9%, Muslim 1.5%, other 1.2%, unspecified 12.7%, none 15.3% (2001 Census)

Languages English 79.1%, Chinese 2.1%, Italian 1.9%, other languages 11.1%, unspecified 5.8% (2001 Census)

Currency Australian dollar (AUD); Exchange rates: 1 USD= 1.31 AUD, 1 EUR=1.67 AUD, 1 GBP=2.48 AUD, 1 SGD=.84 AUD

Internet Users 14,663,622 (2006)
SOURCE: WWW.CIA.GOV

Decompression Chambers

Wesley Hospital (07) 3371 6033
The Alfred Hospital (03) 9276 2269
Royal Adelaide Hospital
(08) 8222 5116
Royal Darwin Hospital
(08) 8922 8888
Fremantle Hospital
(08) 9431 2233
Royal Hobart Hospital
(03) 6222 8308
Prince of Wales Hospital
(02) 9382 3880
Townsville General Hospital
(0)7 47962080 ■

Going It Alone:

Tips for Diving Divas Traveling Solo

Text by Cindy Ross

Many women dream of taking a solo adventure. Kayaker extraordinairre Sheryl Clough coined the phrase, "Go now, and go solo". Women travel safely all over the world, both solo and in the company of others. As you embark on a solo adventure, you'll have naysayers. Thank them for their concern, prepare yourself well and then you'll be ready as you arrive at your destination.

Before you go, research your destination. Not just the fish that you'll see on your dives, but the culture of the country so you'll know what to expect when you arrive. Be sure to understand their dress code. In some cultures, women are expected to wear long skirts or not expose their shoulders and arms. Some cultures are "beach casual" where others dress more formally for land based activities. It's important as you travel to respect the culture you're exploring and avoid negative attention.

Pack smart. You will be bringing your dive kit along, so think carefully about the clothing/accessories that you'll want to bring so you can cart your gear and get around without assistance from others.

Take a self-defense class This is not just a good idea for foreign travel, but also for day to day explorations. Bad guys don't just abide overseas. Being aware of your surroundings and learning a few techniques to ward off would-be attackers can give you a greater sense of confidence.

When traveling abroad, realize that though a foreign environment may seem intimidating at first, if you stay alert and in tune with the surroundings, you'll soon feel like the locals. To ensure your safety while abroad, make sure someone knows where you're going. Leave your travel itinerary with someone at home and send an email or phone call upon arrivals and departures. Many cell phones are able to be used overseas so you may want to check with your carrier to see if yours is compatible with your destination.

FILE PHOTO: PETER SYMES

A woman diver explores the wreck of the *Island* in Storebelt, Denmark

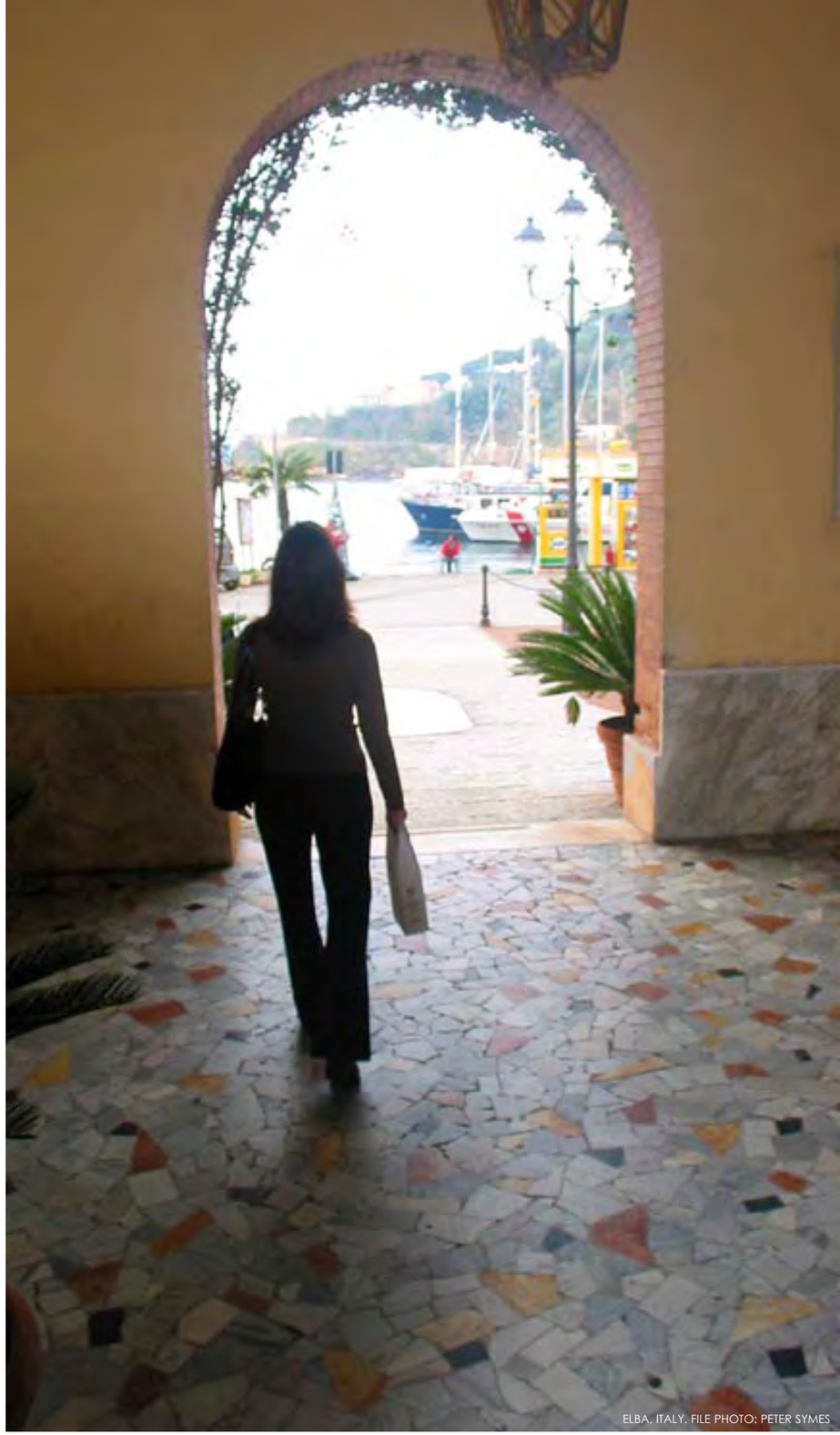
Arrive at your destination during the day This does two things, first it allows you to take in the area by daylight and second, it helps your body to adjust to the lag time when changing time zones. If you must arrive at night, be sure to secure your lodging and your transportation ahead of time. If the hotel does not have a driver for airport arrivals, then definitely hire a "registered" taxi driver. These drivers have been approved by the local municipalities to drive visitors and are a safer choice.

Walk with a purpose Even if you don't know where you're going, by appearing that you're confident and in control, you'll avoid looking like a target. If you must carry a map, try to leave the poster sized version at home. Be discreet and don't hesitate to ask for directions, afterall...we're girls, we can do that. Be aware of how other women in the country interact, as non-verbal signals mean different things in different cultures. When in Rome....

Safe travel is about common sense Don't walk down a dark street, late at night by yourself. Don't allow men you don't know into your room. If you didn't call for room service, and "room service" knocks, call the hotel desk. Remember...there is no such thing as a free lunch. Be wary of men who offer free, private dive tours. They may have something else in mind.

So, what do the "bad guys" look like? Yes, there really are men who set out to prey on women travelers. They typically fall into a few basic categories that will help you to pick them out.

The Silent Type: This man is the one who seems to be constantly where you are. They'll trail you for a couple of hours, trying to make eye contact or get recognition from you. They may even try to start a conversation. This gentleman can be annoying, but normally is not a danger. To deal with Mr. Silent, ignore him and avoid eye contact, while keeping an eye on the situation



ELBA, ITALY. FILE PHOTO: PETER SYMES

The world is your oyster if only you take just a few savvy precautions...

mermaid matters


FILE PHOTO: PETERSYMES

Diving diva explores the wreck of *Dr Eichelbam* in Storebelt, Denmark

at large. If this doesn't drive him away, consider going to a police station or hotel, and chances are he'll not follow.

The Crossing Boundaries Guy: This man will start with questions. Maybe in multiple languages, if needed, until he finds the language that you speak. Again, if you ignore him, he'll probably go away. Note here, that not all gentlemen who try to engage you in conversation are dangerous. Brilliant stories abound about women meeting the love of their life on holiday. Just be aware that if the questions get to personal, dealing with where you are staying, are you traveling alone or other questions that make you feel uncomfortable, you should simply stop talking to him.

The Guide: This is the local native who offers the free boat ride, jungle exploration or simply a car ride. These types usually inhabit touristy destinations and can be easily dissuaded, as there are many other travelers for them to focus their attention on. Trust your instincts...if they seem creepy, they probably are.

If you find yourself the target of unwanted attention, you'll want to deal effectively with it. First, intuition is a gift that we have been given...embrace it. If that little voice says somethings wrong, it's usually right. Don't let someone talk you into something you don't want to do. You are ultimately responsible for your decisions, make sure your decisions are the responsible ones for you.

Don't be afraid to ask for help

Worldwide, most people are eager to help travelers to their country, especially women going solo. If you're being followed on foot, the local police station or hotel front desk will gladly give you assistance. On a bus or train, ask a fellow passenger or driver for help. Men like playing the part of hero. It's in their wiring, no matter where they are from.

Leave your polite self at home

If you're being harrassed or encroached upon, stop talking and ignore the person, while being aware of their actions. If you need to say "NO!", say it repeatedly and loudly to get your point across. If you're attacked, be loud and aggressive to show that you're not an easy target. Remember, the bad guys are not a hard working lot, and they like victims that don't require a lot of work.

Passport

The crown jewel of Canada, Vancouver Island, was only a quick trip across the border just a year ago. However, with the new passport regulations, I have found that I need to have my documentation in order, to keep that trip fast and carefree.

Post 9/11, the tightening of border security and new passport requirements mean that as a traveler, you don't want to overlook pertinent details of the passport policies, only to find out when it's too late.

Mexico, Canada and the Caribbean were travel destinations that only required a birth certificate if you were from the US. However, the new Western Hemisphere Travel Initiative goes into effect on December 31, 2006. At that time, all US citizens traveling by air or sea, to or from Canada, Mexico, Central and South America, the Caribbean and Bermuda will need to possess a valid passport. And on December 31, 2007, the initiative will be extended to include land border crossings to these countries as well. So, the Caribbean cruise or ski trip to the popular Canadian Rockies will be accompanied with a passport.

Without a passport, you will still be able to travel to US Territories, such as Puerto Rico, the US Virgin Islands, Guam, the Northern Mariana Islands and American Samoa. However, if you plan on hopping from a US Territory to a foreign region, such as from the US Virgin Islands to the British Virgin Islands, you will need a passport.

The State Department hosts an entire website dedicated to information about applying for passports, as well as the appropriate forms and a search engine to find a passport acceptance facility in your area. You can also find details about international travel and visa regulations. Or, you can call 877-4USA-PPT (877-487-2778) to request further information.

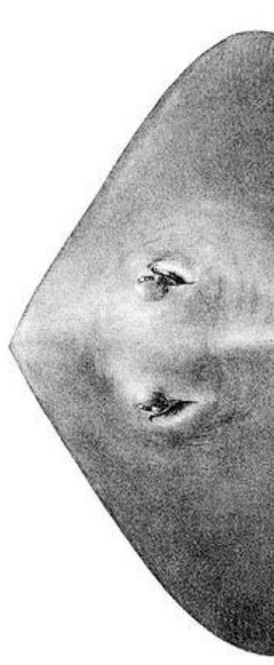
Cindy Ross is a dive instructor and writer dedicated to promoting the scuba lifestyle for women of all ages worldwide. For more information, please visit: ***Girldiver.com*** ■

ILLUSTRATIONS BY PETER SYMES

The biology of Stingrays

Can they be handled?

PETER SYMES

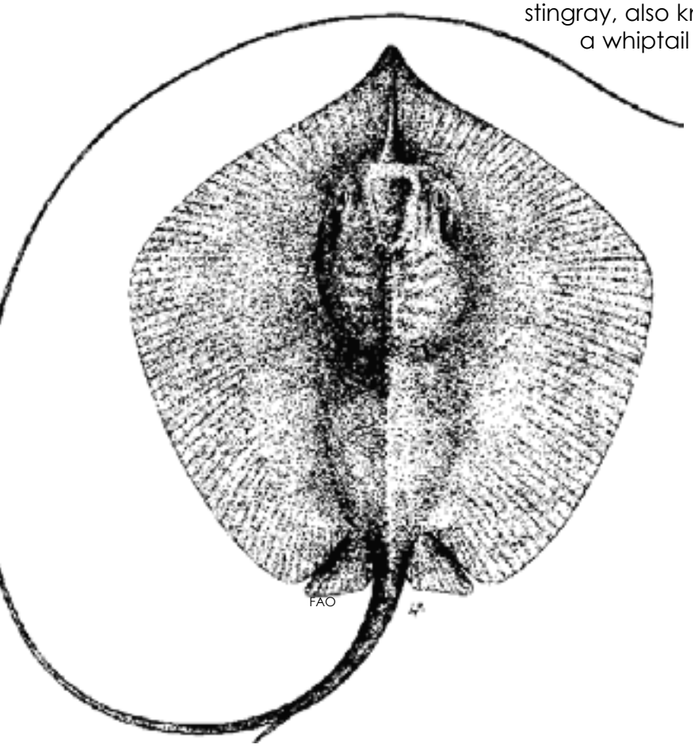


Text by Michael Arvedlund, Tyge Dahl Hermansen and Peter Symes

There are more than 500 species of rays and skates

Stingray kills television host

The headlines soon spread all over the world when the famous Australian philanthropist and television host, "crocodile hunter" Steve Irwin, was recently killed by a stingray, also known as a whiptail stingray.



FAO

During the filming for a documentary, Steve Irwin was swimming along with the ray and apparently spooked it, causing it to raise its tail in defence. In a terrible instant, the sharp and serrated barb on the tail went into Irwin's chest inflicting a lethal injury by perforated his heart. Steve Irwin just managed to pull the denticle out before he lost conciousness, and soon after, he died.

Steve Irwin often took chances, yet, somewhat paradoxically, risk taking didn't lead to his demise. This time, he didn't do anything other than swim. Based on these and other similar conditions, it may be worth revising the belief that stingrays are harmless.

The 'sting', which gives these fishes their common name, is a modified dermal denticle mounted near the base of the tail, about one-third along its total length. The sting consists of a blade-like barb with serrations along both edges and a venom gland at the base. (see figure next page)

What kind of fish are stingrays?

Stingrays are rays, i.e. cartilaginous fishes related to skates and sharks. Rays and skates comprise a scientific so-called super-order of cartilaginous fishes named *Batoidea*.

Cartilaginous fishes do not have a skeleton of bone. Instead, it consists of cartilage, a type of dense connective tissue. It is composed of collagenous fibers and/or elastic fibers, and cells called chondrocytes, all of which are embedded in a firm gel-like ground substance called the matrix.

Over 500 species

There are more than 500 species of rays and skates in twelve families, including stingrays, skates, electric rays, guitarfishes and sawfishes (Box 1). The Batoids are closely related to sharks. In fact, in the early part of the Batoid life cycle, they look much alike young sharks. It is interesting to notice that there while there are only approximately 370 extant species of sharks—which is over 100 less species than rays and skates—sharks have received considerably more attention than rays and skates, both from the general public and from the scientific community... at least until now.

The Dasyatids

The scientific name for the family of stingrays, or whiptail stingrays, is *Dasyatids*. They are common in tropical coastal waters throughout the world. Freshwater species are also known from e.g. Asia and Africa. The species of the genera *Potamotrygon, Paratrygon,* and *Plesiotrygon* are thus endemic to the freshwaters of South America.

Rays range in size from just a few cm to several meters wide. The smallest ray is probably the short-nose electric ray, which is the size of a pancake; it is only 10 cm across and weighs about half a kilo. The biggest ray is the manta, which can reach a width of over three meters as an adult.

Their habitat

Most species live on the sea floor, in a variety of geographical regions—many in coastal waters and a few species live in deep waters. Most batoids have a rather cosmopolitan distribution in tropical and subtropical marine environments or temperate waters. Only a few species, like manta rays, are oceanic, i.e. they live in the open sea. A couple of species are confined to freshwater. Some batoids can live in brackish bays and estuaries. Bottom-dwelling batoids breathe by taking water in through so-called spiracles, rather than through the mouth as most fishes do, and passing it outward through the gills. Their mouths and gills (like almost all rays) are located on the underside of their flat bodies making breathing an issue if you lie on or are more or less buried in sand. To overcome this hurdle they have developed extremely large

NOAA

The biology of Stingrays

PETER SYMES

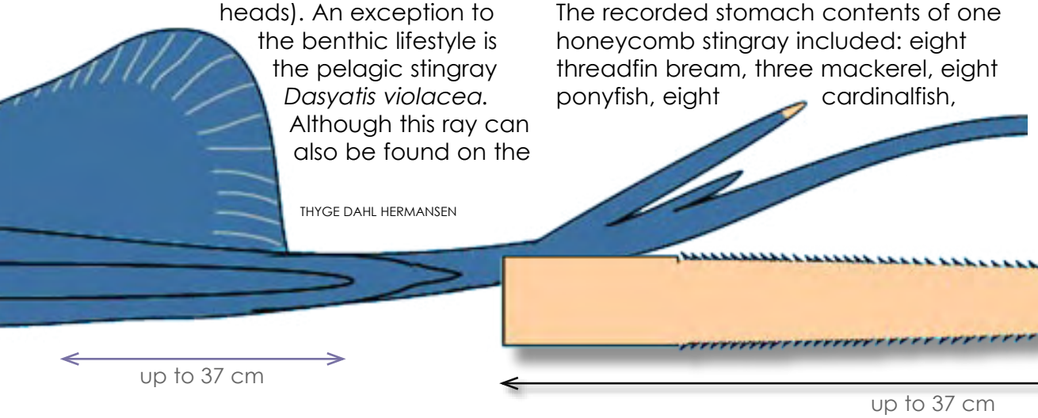
A whiptail stingray lies buried in the sand, keeping a watchful eye on matters

spiracles (spiracles are the openings positioned just behind the eyes through which a shark or ray can suck in oxygen rich water to flush over the gills). Through this mechanism rays are able to remain motionless for hours at a time.

Many whiptail stingrays are restricted to marine habitats but some are known to migrate into brackish estuarine environments. A few species can live year round in both fresh and salt water. Whiptail stingrays are benthic. They spend much time buried with only their eyes sticking out. This is a defensive strategy rather than a stealthy way to surprise prey. Because they tire easily when swimming, remaining buried is the ideal way to avoid becoming lunch. Whiptail stingrays are heavily preyed upon by a number of shark species (especially by hammerheads). An exception to the benthic lifestyle is the pelagic stingray *Dasyatis violacea*. Although this ray can also be found on the substrate it is a free swimming ray that preys on oceanic squid and mid water fishes, which it manipulates by holding them between its pectoral fins. Because of its unique behavior the Pelagic Stingray is sometimes categorized in its own genera—*Pteroplatytrygon*. Whiptail stingrays usually inhabit shallow coastlines down to 100 or 200 meters, but some species can be found at 600 meters or even deeper.

Diet

Most batoids have developed rounded teeth for crushing the shells of snails, clams and crustaceans and some fish, depending on the species of ray or skate. Manta rays are plankton feeders Whiptail stingrays known to eat mollusks, crustaceans, jellyfish, and bony fishes. The recorded stomach contents of one honeycomb stingray included: eight threadfin bream, three mackerel, eight ponyfish, eight cardinalfish, three sardines, three anchovies, two flatfish, one mojarra, four flatheads, three pufferfish, five squids, two crabs, and two mollusk shells!



THYGE DAHL HERMANSEN

up to 37 cm

up to 37 cm

The tail spines of a whiptail stingray are actually highly modified dermal denticles. Each spine features a soft center of venom-producing tissue and an enameloid casing with serrations pointing toward the base. This is a feature that makes removal hard and painful for the unlucky victim. Like other dermal denticles, such as shark teeth, these stinging spines are replaced continually. Most stingray species have two such spines, each stemming from its own site on the tail and with its own cycle of development, growth and replacement. Substitute spines usually interchange between loci spread out by about half a cycle, so that one spine (the older) is typically larger and more worn than the other.

PETER SYMES

Stingrays are crawling all over visitors in Stingray City on Grand Cayman. This location is probably the island's biggest tourist attraction

Whiptail stingrays are known to gather at fishermen's fish cleaning stations to take advantage of the scraps that end up on the seabed. In some locations, such as Stingray City in Grand Cayman and Hamelyn Bay in Western Australia, their tolerance towards humans has reached the point where they will eagerly accept scraps straight from the hands of tourists. Although these interactions have altered the stingrays natural behavior, there is no evidence that they have lost the ability to hunt on their own.

Stingray City tours are now a multimillion dollar industry that attracts hundreds of tourists daily. Although the large Southern Stingrays get quite aggressive while they are competing for handouts of squid, they rarely harm the tourists, preferring to back off when trodden on rather than use their defensive tail stings. Traditionally, stingrays were feared by fishermen and beach goers alike, so the positive press that the rays receive from these encounters is a welcome change that may be a critical factor in their future survival.

NATIONAL INSTITUTE OF WATER AND ATMOSPHERIC RESEARCH

Reproduction

The batoids are extraordinarily varied in their mode of reproduction. Most rays and skates are benthic, lying on the substrate for extended periods, often to some extent buried. Some forms, however (particularly the eagle, cownose, manta and devil rays) are secondarily pelagic, swimming strongly in mid-water and rarely resting on the bottom. Mating season occurs in the winter. When a male is courting a female, he will follow her closely, biting at her pectoral disc. During mating, the male will go on top of the female (his belly on her back) and put one of his claspers into her vent. Most rays are viviparous bearing live young in "litters" of five to ten. Therefore, batoid eggs, unlike those of most other fishes, are fertilized inside the female's body. The female holds the embryos in the womb without a placenta. Instead, the embryos absorb nutrients from a yolk sac, and after the sac is depleted the mother provides uterine milk. Skate egg cases are often rectangular with extended tendrils at each corner, which serve to anchor them to bottom growth (washed ashore, the empty cases are known as "mermaid's purses"). Fetal electrical rays (Torpediniformes) are nourished by protein-rich secretions from the uterine wall, while fetal stingrays (Myliobatiformes) get their nourishment delivered to them via secretions from pseudo-placentae that enter their bodies through the spiracles.

Are stingrays dangerous?

Stingrays are not, as their close relatives, the sharks, known for being dangerous. While sharks through history have worked up quite a reputation among other things thanks to their impressive denture, large

Jan Derk

Stingray

bodies and sometimes aggressive behaviour the rays have rarely made much headlines and for a good reason. Rays do not present a direct threat to humans venturing into the water. Unlike sharks, they can't eat or bite us, nor do they usually display any aggressive behaviours but tend to mind their own business. But that doesn't mean that stingrays are not dangerous at all.

Like so many other animals, they can become defensive if they feel cornered or bothered and their stinging barb, a cartilaginous spine situated on the root of their tail, can inflict some nasty wounds.

Self-defence

Stingrays use their stinging spines only in self-defense. Dasyatids generally do not attack aggressively or even actively defend themselves. When threatened, their primary reaction is to swim away. However, when they are attacked by predators or stepped on, the barbed stinger in their tail is whipped up. This attack is normally ineffective against their main predator, namely sharks. Humans are usually stung in the feet (depending on the size of the stingray). The stinger often breaks off in the wound, which is non-fatal to the stingray, and will be re-grown. Contact with the stinger causes local trauma (from the cut itself), pain and swelling from the venom, and possible later infection from bacteria on parts of the stinger left in the wound.

The 'sting', which gives these fishes their common name, is a modified dermal denticle mounted near the base of the tail, about one-third along its total length. The sting consists of a blade-like barb with serrations along both edges and a venom gland at the base. The serrae point toward the base of the spine, making removal difficult and very painful. The venom is a fairly powerful nerve toxin which affects the heart in complex and dangerous ways. World-wide, several stingray-related fatalities are recorded every year - as sometimes occurs when a diver swims too close over a partially buried ray and is stung in the neck or chest.

As regards to Steve Irwin's fatal accident, it is widely regarded as an unlucky combination of unfortunate circumstances—a freak accident in other words—but it goes to show that divers and snorkellers should always keep a minimum distance from stingrays of one to two meters.

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Ray and Skate Taxonomy

Rays and skates (Batoids) are divided into three orders:

(A) Order *Rajiformes* (true rays)

Within the order *Rajiformes* are the stingrays (Family no. 2). They are named for the venomous spines along the tail; these contain a poison that causes pain and may cause symptoms such as nausea, vomiting, fever, chills, muscle cramps, tremors, paralysis, fainting, seizures, elevated heart rate, and decreased blood pressure (depending on the species). Some species' toxins and, or, sting can be fatal to humans.

1. Family *Anacanthobathidae* (smooth skates).
2. Family *Dasyatidae* (stingrays).
3. Family *Gymnuridae* (butterfly rays).
4. Family *Hexatrygonidae* (sixgill stingray).
5. Family *Myliobatidae* (eagle ray). The largest of rays, including the giant manta ray. Most eagle rays have one poison-carrying spine.
6. Family *Plesiobatidae* (deepwater stingrays).
7. Family *Potamotrygonidae* (river stingrays).
8. Family *Rajidae* (skates).
9. Family *Rhinobatidae* (guitarfishes). Contain a body structure similar that of the sawfishes, but are not thought to be closely related.
10. Family *Urolophidae* (round rays).

PETER SYMES

Skate

(B) Order *Pristiformes* (sawfishes)

Sawfishes are shark-like in form, having tails used for swimming and smaller pectoral fins than most batoids. The pectoral fins are attached above the gills as in all batoids, giving the fishes a broad-headed appearance. They have long, flat snouts with a row of tooth-like projections on either side. The snouts are up to 1.8 m long and 30 cm wide, and used for slashing and impaling small fishes and to probe in the mud for imbedded animals. Sawfishes can enter freshwater rivers and lakes. Some species reach a total length of up to 6 m.

1. Family *Pristidae*.

(C) Order *Torpediniformes* (electric rays)

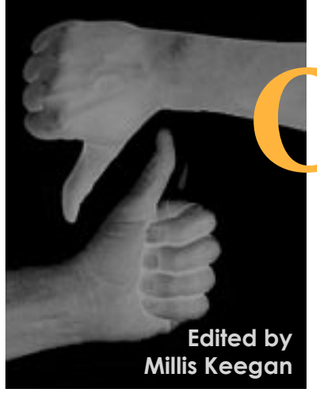
Electric rays have organs in their wings that generate electricity, used to immobilize prey and for defense. The current is strong enough to stun humans.

Family *Narcinidae*

1. Family *Torpedinidae*

NOAA

Lesser electric ray



Edited by
Millis Keegan

Letters & Opinions

All perspectives expressed in this section are those of the individual author and do not necessarily reflect the views of X-RAY MAG, DiveGuru.Net, or their associates

Thank you all, for your opinions on Terrorism and Diving and on the subject of DO WE EVEN CARE ANYMORE? Your comments show some real insight, knowledge and concern, and we would like to share some of them with you:

What do *you* think?

Get heard! Send us you opinion to diveguru@xray-mag.com by Jan 10, 2007, and get a chance to win these exquisite *Silver Hammerhead Cufflinks* generously sponsored by **ReefJewellery.com**

Right or wrong?

We would like to think that divers bring to the water the notion of "take nothing but memories, leave nothing but bubbles". Traveling as much as we do here at X-Ray Mag, we find that that is not always true, and in many cases, bad behavior is encouraged by the dive centers and dive resorts. This time, we at Diveguru.net and X-Ray Mag want to bring up the subject of feeding fishes while diving, a popular activity to bring the marine life to the divers/snorkelers in a misguided attempt to enhance the under water experience.

At DEMA, we came across a few vendors selling the latest in fish feeding equipment—a squirt bottle with fish food. The sales pitch was that the food is safe for the fish, and the squeeze bottle promises a safe encounter since it squirts the food away from you, which keeps the fish from nibbling at you by mistake. All sounds good in theory, but we divers, we know better, right? We know that feeding the marine life teaches fish to associate human beings with food, which disturbs that very important balance on the reef, essential to the survival of species.

Our viewpoint is clear: only under a very few and specific circumstances, is it okay to feed the marine life.

What's your take on this?

Is it right or wrong to feed the marine life? Is it right or wrong for dive centers and dive resorts to enable fish feeding by selling these kinds of products?

Let us know what you think

Millis Keegan, editor

MILLIS KEEGAN

Good or bad idea? A squirt bottle with fish food meant to be brought on a dive was on display at the recent DEMA show, meant to be sold through resorts and dive centers

On Terrorism and Diving

I would intellectually agree with the sentiment that we should not let terrorism dictate nor control our lives. That being said, I personally believe diving can be dangerous enough without the added adrenaline of deliberately putting myself (or my loved ones) into a potentially dangerous arena.

One of the goals of the terrorists is to cause object disruption of all aspects of the targeted society. The terrorists care nothing about life —yours or theirs. The terrorists care nothing about your brand-new dive wing or regulator. The terrorists care not whether you dive split fins or use the long primary hose. The terrorists want you dead.

We, the casual traveler and visitor, can do nothing to prevent the terrorists. But, if sufficiently motivated, governments might. I can choose to spend my dive vacation funds where I like, and I will not be supporting any element of a nation or a people that choose to "look the other way" where terrorism is concerned. I know this attitude hurts the "little guy", the hotelier or dive shop, whomever, but maybe, just maybe, this form of economic pressure can generate sincere local pressure from within, and maybe THAT can persuade governments to get more serious about the matter. As when underwater, I will not be holding my breath! Thanks for a great Magazine!!

We, the casual traveler and visitor, can do nothing to prevent the terrorists. But, if sufficiently motivated, governments might.

Bill Hilson, professor,
Pratt Institute, New York, USA

NOWAK

Dahab, beach promenade

I just read the letters about diving in Egypt and had to reply. My girl friend and I were on a trip to Egypt in February. We spent three days in Dahab, and while we were there, we ate at the restaurant Al Capones; it is one of the places where bombs went off and killed people. While we were there, we found all the people there to be extremely friendly and got to know the staff as well as you can in a couple of days. If we weren't on the beach or diving, we would be found at the restaurant. One of the people that was killed there, was a very friendly man that worked the entrance. He would joke around with us and was a joy to see and talk to. It is a great shame that innocent people are dying. As far as traveling back there, I was asked a week after the bombing if I would return. I would have left in an instant and still would. Yes, it is important to watch where you are going, but if I was to worry about anywhere a bomb might go off, or an act of terrorism happened, I may as well stay at home. Thanks,

I was asked a week after the bombing if I would return. I would have left in an instant and still would.

Ron Cooper
TransAlta Utilities, Poplar Creek Power
Fort McMurray, Alberta, Canada

Do We Even Care Anymore?

We asked this simple and straightforward question in a past issue.

From Jim Culter:
Actually, a very complicated question. The simple answer is some care and some don't. Some readers have an altruistic response while others express the rather myopic juvenile opinion that the only thing that matters is personal gratification and anything that interferes with personal consumption is either a fallacy or a conspiracy.

The human species has a difficult time relating to global issues or even regional issues of ecology. Unfortunately, education has not enabled the general population to logically assess these issues. There is a great paradox present in the role of the human species on the quality of life on earth. The actions of a single individual on consumption of materials, food, energy, conservation, are of no consequence on a global scale. However, as a species, our combined effect is changing the fundamental nature of the earth's biosphere. So, the statements, "It's not my fault" and "It's my fault", are both true as odd as that seems.

As a species, we have not yet developed a sense of global scale. For millions of years, the human species had relatively small effects on the planet, and by most measures, the earth was infinite in size and resources. However, all of this changed with the advent of agriculture and subsequent industrialization. Suddenly, an individual in concert with billions of other individuals was capable

LONNIE THOMPSON, BYRD POLAR RESEARCH CENTER, OHIO STATE UNIVERSITY

Ice Core sample taken from drill

of depleting resources, creating toxic substances and causing global ecological changes. At present, the human species is the most important organism on the planet, because we are altering the fundamental ecological conditions that enabled mammals and humans to evolve and nurtured our success as a species. It should be pointed out that the current world climate conditions have been relatively stable when compared to larger time scales. Now, we are irreversibly tinkering with and changing the climate conditions that fostered human life.

Now we are irreversibly tinkering with and changing the climate conditions that fostered human life.

The implications of these changes are onerous, and we cannot predict the outcome. We imagine that we will be able to adapt to a changing planet, one that could be quite different from today's conditions. This may not be possible. The latest information indicates the effect of green house gases on global warming may be underestimated. Also, the rate of change in global habitats associated with the effects of climate change has been happening faster than originally predicted. Studies of ice cores have indicated that there may be climatic trigger points, and when these points are reached, there are profound global climate changes that happen rapidly, on the order of decades rather than centuries or eons.

Sadly, the human species is its own enemy. The basic tools needed to create a sustainable society are simple: reduce the number of humans on the planet through family planning and access to birth control, practice sustainable agriculture, utilize renewable energy sources, stop contamination of the environment with persistent toxic substances.

Sadly the human species is its own enemy.

I do not have much hope that such things will happen. Sadly, the "Tragedy of the Commons" continues to be the norm for humanity. (If you do not know what this means, look it up. Wikipedia is a good start.)

Jim Culter, Staff Scientist
Center for Coastal Ecology Benthic Ecology Program
Mote Marine Laboratory
Sarasota, FL

NASA

Hurricane Catarina as seen from the International Space Station

About Hurricanes

Living in the relatively hurricane free UK tends to make us unaware of the true suffering of those countries that suffer the consequences of a very strong blow. On a recent trip to Grand Bahama (last February), I was amazed at the destruction still very much apparent after two years of bad hurricanes. Desolate, abandoned and derelict hotels and half empty shopping malls seemed to be the norm. So many locals out of work with little or no prospects gradually slipping nearer the bread line. Yet, most of the dive sites were still in good condition. So, why all this desolation and depression? It would appear that as soon as we softies hear of hurricane damage, we immediately cancel our holidays, pack our bags and go elsewhere. Thus, island communities not only suffer from nature but from a great drop in tourist revenue, which prohibits repairs, which means less tourism, which means less dollars, and so on. I even spoke to an American friend of mine who put it: "When I vacation. I like comfort. So, buddy, repair your island, and we will return." Surely, a very cynical and selfish approach.

What these communities need is not for us to neglect them, but for us to continue as before. They still have rich natural beauty for us to see. They still have wonderful undersea sites to visit, and most of all, they still have a great population who would welcome us tourists and our dollars. Despite the damage, Grand Bahamian people showed me great hospitality and displayed great resilience.

What these communities need is not for us to neglect them, but for us to continue as before.

Brian Naylor
United Kingdom

Drysuit article in X-Ray Mag #13 created some debate

How to Dive With a Dry Suit ... or Not

I have read several issues of your magazine and quite enjoy the articles. I have found them very informative up to now, but feel I have to write to you about the article on how to dive with a drysuit. The author of the article recommends diving with a BC, but only using the BC inflation at the surface or in an emergency. This is both incorrect and dangerous. A drysuit should have just enough gas to prevent a squeeze and allow the insulating material gas to insulate. To use the additional gas required for buoyancy especially on deeper dives results in, at best, difficulty maintaining proper trim when shifting position in the water, and at worst, makes an uncontrolled foot first ascent a very likely possibility. I do not know of ANY technical diving training agencies that recommend this technique for dry suit diving and would suggest someone look into this and submit a follow up on how to use a drysuit.
Yours Truly,
Jeffrey Mark, no adress supplied

Millis Keegan, Training Editor replies:
Well Jeffrey, as with most things, there are more than one way to do things right. While recreational dive training agencies do recommend performing your buoyancy control the way the article described it, technical diving procedures are different. But although the article did not target technical divers, I believe you have a point. There are indeed differences and they should be highlighted.

We approached NAUI, PADI, IANTD and ANDI for a comment and got swift replies from ANDI and PADI. This doesn't imply that NAUI and IANTD has chosen not to comment but, in all fainess, I must emphasize that the lead time we gave everybody was very short. We thank ANDI and PADI for their reply, which I believe clearly shows the different procedures between recreational and technical diving—and may no one confuse one with the another!

ANDI, *technical training agency writes:*
There are different procedures on how to use a dry suit and a BCD, depending on if you dive recreationally or technical, and it is important to know the difference. Technical divers are highly trained to use extra equipment while diving and they are probably capable of handling two buoyancy devices or more. However, to adress the issue issue in question:

Recreational training agencies tend to teach the diver to use the drysuit as a buoyancy device, feeling the diver is incompetent to control two buoyancy sources. When diving with more than just a single tank, this is outright dangerous.

Think of the following scenario: You have enough gas to offset 22lbs (10kg) of negative buoyancy—this is a fairly large gas bubble. You now orient yourself away from the prone position with a head up attitude. Unless your neck seal is tight, you WILL burp gas out of the neck seal and quickly become negative. Using the drysuit as a buoyancy device is only done during emergency procedures IF

Letters & Opinions

FILEPHOTO: ADAM BUTLER

Drysuit and/or BCD for main bouyancy device? It all depends it seems. Photo is of Leigh Cunningham and Mark Andrews during their record dive to locate the *Yolanda* wreck

your wing fails.

The managing of two or more buoyancy sources takes a bit more work, but once mastered, the diver's buoyancy control is superior to that of a diver using just one source (such as the drysuit) for buoyancy.

The proper procedure when diving with multiple tanks (and also better even with a single cylinder—it is just a bit harder at the beginning) is to just add enough gas into the drysuit to manage squeeze and manage buoyancy with the wing/BC.

There are several reasons why using the drysuit for buoyancy is dangerous. First, the amount of gas needed to offset additional negative buoyancy calls for a large volume of gas that causes a gas bubble to move around. With additional gas, it's impossible to dive with head slightly down and feet up without ending up with too much gas in the boots. Whereas, using just enough gas to eliminate squeeze, this attitude is easy.

The proper procedure (...) is to just add enough gas into the drysuit to manage squeeze and manage buoyancy with the wing/BC.

When I conduct rebreather training, we now have ***three*** gas spaces to manage: BC(wing), drysuit and the breathing loop. Divers who were trained to use the drysuit for buoyancy have all sorts of trouble until I can retrain them on how to correctly use a drusuit. I have trained several Instructors from agencies like PADI that teach drysuit diving as a specialty, that I have had to retrain because they can't maintain the proper orientation and buoyancy control.

The procedure using a drysuit for buoyancy is OK as long as the diver does not have to overcome a large negative buoyancy or have a large buoyancy shift during the dive. Neoprene drysuits are especially bad here...

Joe Radomski, ANDI ITD#10

***PADI**, recreational training agency writes:*
There are no rules that forbid anyone to use both a BCD and a dry suit for buoyancy control while diving, but for recreational divers using a dry suit, we recommend the following:

1. **Get proper dry suit training.**
2. **Use your BCD on the surface for buoyancy, and if necessary, to help if a dive buddy in distress needs extra buoyancy.**
3. **Use your dry suit for buoyancy control while diving.**

The reason is to keep air in the suit for warmth and comfort and to avoid a squeeze. There will always be some divers, in particular before they develop more experience with dry suit diving, that will keep just enough air in their suits to avoid squeeze and use the BCD for buoyancy control. That can cause problems for the same unexperienced divers that have to deal with two buoyancy devices during ascent, which can lead to an uncontrolled ascent. If the diver uses too much air in the suit as mentioned in the letter, he/she carries too much weight, and has not done a proper buoyancy control before the dive.

About technical diving and how to use a dry suit... They might recommend other techniques that will work better for their equipment configuration and type of diving, and I leave that up to them to answer.

Michael 'Mox' Moberg, training director and regional manager for PADI Nordic

FILEPHOTO: ADAM BUTLER

Granted, it is not always that the bouyancy from the drysuit is enough, or the right means. But everything needs to be seen in the right context

And the winner is…

What is the Best Environmental Organisation we asked? Our readers pointed to GREENPEACE as their favourite. Here are some of the arguments.

I suppose Greenpeace for its longevity and international focus along with the ability to engage media coverage. I say "suppose" because I'm not sure what measures one might use to gauge effectiveness. Perhaps climactic changes will do the most to promote awareness in the long run, being so much more "in-your-face" with consequences.

Lance Evingson
No adress supplied

For me, it is Greenpeace. I appreciate the level of dedication and, at times, agressive stance they take in an effort to actively prevent environmental destruction. Case in point is the stance Greenpeace takes on commercial whaling. For their effort against the commercial whaling fleet, Greenpeace gets my vote (and my money).

Kristjan Snorrason,
No adress supplied

I think Greenpeace is the best Environmental Organization due to the fact that they are global, important (attract media attention) and extremely brave (some of them have died on operations).

Mario Mizrahi S,
Mexico

I would have to say that Greenpeace is the best and most visible environmental groups in the world and does the best job of protecting the environment. Although some may think Greenpeace's methods extreme, they are effective. Greenpeace is an international organization that focuses its efforts on worldwide threats to biodiversity. They have served to protect both the terrestrial and marine environments. They are highly visible in the media and their efforts spawn awareness of environmental problems from ocean dumping and whaling to clear-cut logging practices. They also encourage sustainability practices and promote awareness of global climate change.

Tom Carlson
Tacoma, Washington, US

GREENPEACE / DORREBOOM, LORETTE

Greenpeace's SV RAINBOW WARRIOR in full sail between Majuro and Ebeye in the Marshall Islands.

Sharing second place is WWF and PADI

I think PADI Project AWARE does the best job as it focuses on protecting our oceans, coasts, reefs, fresh water lakes, etc. As our sport grows in popularity, more of us will become AWARE of our environment and make conscious efforts to keep it clean. This will go a long way in protecting the seas for future generations. Thank you,
Jim

PADI. Before diving, I was only vaguely aware of environmental issues. During my Open Water course, I was made aware of deeper concerns and the negative impact we have on our environment and that by following a few recommendations and respectful diving practices, we can positively influence and help reverse some of the damage inflicted.

I have witnessed many PADI professionals give advice and knowledge to hundreds of divers. I would like to believe they are thus respectful of the environment in which they exist and go on to help educate the people they interact with. I know I do.
Tony Williams
United Kingdom

My nomination for the organization that does the best job protecting the environment goes to WWF Global Network. For full explanation of this tough choice see the attached file. Here is a summary:

The WWF launches large scale operations that yield large scale returns. With thousands of world wide events and tasks yearly they have left legacies for generations to come. The mere size and reputation of WWF empowers them to be heard and influence policy and corporate behavior around the globe.

WWF works on many levels. With the help of partners WWF seems to aspire to treat both symptoms as well as try to solve underlying causes. Their environmental programs go hand-in-hand with their social programs. They also have a large educational program that teaches others how they also can make a difference in the future of our planet. These factors make them stand out amongst the environmental organizations. Luckily, they are closely followed by many other organizations.
Sincerely,
Laurits Thomsen

Other Organisations Mentioned

The Cousteau Society, The Nature Conservancy

I believe that the Nature Conservancy does the best job in conserving our environment. Not only does the Conservancy protect the lands and waters of our great country, but all around the world as well. Without a doubt, the most important aspect of this organization is that it completely shelters a special place. For instance, when a coral reef is in danger of being polluted or ruined for one reason or another, the Nature Conservancy acquires everything from the headwaters of the estuarine rivers to the reef itself, so the area is totally protected. Thanks,
David Ward
Lakeland, Florida

About the DiveGurus

Millis Keegan, owner and founder of www.diveguru.net, the homepage that answers questions for divers, snorkelers, anyone with a love for our oceans, is a new member of X-Ray Magazine. With the help of reputable experts www.diveguru.net will find the answer.

Humpback Whales Have 'Human' Brain Cells

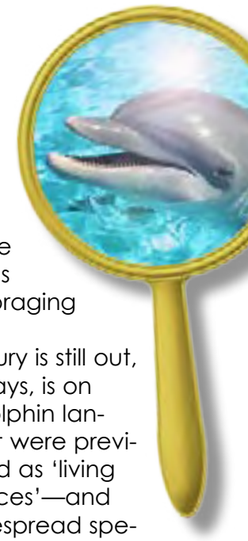
Humpback whales are probably much smarter than they have been given credit for. US researchers have just discovered a type of nerve cell called a spindle neuron in the cortex of their brains, in areas comparable to where they are seen in humans and great apes. The finding may help explain some of the behaviours seen in whales, such as intricate communication skills, the formation of alliances, cooperation, cultural transmission and tool usage, the researchers report in The Anatomical Record.

Although the function of spindle neurons is not well understood, they are thought to be involved in learning, remembering and recognizing the world around oneself. The researchers found spindle neurons in the same location in toothed whales with the largest brains, which the researchers said suggests that they may be related to brain size.

Toothed whales such as orcas are generally considered more intelligent than baleen whales such as humpbacks and blue whales, which filter water for their food.

"It is important to note in this context that sperm whales, killer whales, and certainly humpback whales, exhibit complex social patterns that included intricate communication skills, coalition-formation, cooperation, cultural transmission and tool usage," the researchers wrote. ■

Whales And Dolphins Show Many Distinctive Human Traits



More scientific evidence is piling up that whales, dolphins and porpoises are truly extraordinarily intelligent creatures. According to a new review of the scientific literature by Mark Simmonds, director of science for the Whale and Dolphin Conservation Society. A growing number of studies strongly suggest that whale and dolphin brainpower is matched only by the higher primates, including man,

For instance, captive animals have been shown to be able to recognise themselves in a mirror, which was previously known to be the domain only of humans and the great apes.

Dolphins can also "point" at objects with their heads to guide humans to them, and they can also manipulate objects spontaneously, despite their lack of fingers and thumbs.

There is a well-documented use of tools in an Australian population of wild Indo-Pacific bottlenose dolphins, which are often seen carrying sponges on the ends of their beaks, probably to protect them whilst they forage in the sediments on the sea floor where spiny sea urchins might otherwise cause puncture wounds.

They show remarkably human-like emotions, ranging from joy to grief to attentive care of the hurt. Mr Simmonds quotes a case of a 30-strong pod of false killer whales which remained with an injured colleague in shallows for three days, exposing themselves to sunburn and the risk of stranding, until the injured animal died. And there is an "emerging but compelling argument", that some species exhibit culture—information or behaviour that is acquired through social learning. This may range from the complex songs and calls to foraging strategies.

Where the jury is still out, Mr Simmons says, is on whale and dolphin language. "What were previously regarded as 'living marine resources'—and typically, widespread species distributed across an inexhaustible sea—should now be recognised as unique individuals, communities, societies and cultures and valued as such."

It means that the potential impacts of whaling may be far greater than they appear, and we should make a new approach to the conservation of these species which takes into account their intelligence, societies, culture—and potential to suffer ■

NOAA

U.S. FISH & WILDLIFE SERVICE

Manatees May Also Be Smarter Than We Think

Manatees have generally been viewed as cute but somewhat dimwitted creatures incapable of doing anything more complicated than chewing sea grass. But new research under way at MOTE Marine Laboratory suggest otherwise.

Here, manatees in tanks have been trained to respond to whistles and stop at underwater targets. At the sound of a buzzer, a 1,300 pound manatee will aim his whiskered snout toward one of eight loudspeakers lowered into the water. Pointing out the correct speaker earns him treats—sliced apples, carrots and beets for correct test responses—revealing that manatees aren't so stupid after all. The buzzer experiments are hearing tests in which the tones gradually grow shorter and softer. The researchers want to know: At what distance can the manatees hear a boat's propeller churning in the water and can they determine where the sound is coming from? Despite recent findings that suggest the animals hear well enough to avoid boats, researchers are not sure why manatees keep getting hit. They could be surfacing to breathe while sleeping, or they may have grown too accustomed to the sound of boats. At least 75 manatees have been killed this year in collisions with watercraft, according to the Florida Fish and Wildlife Conservation Commission. ■

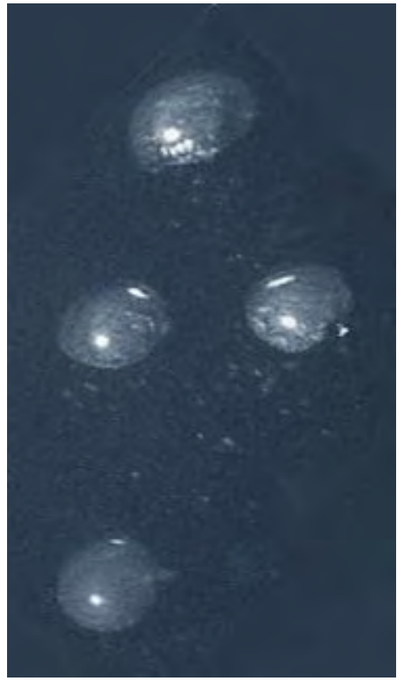

PHOTO COURTESY COLIN D. MACLEOD, UK. CETACEAN SOCIETY INTERNATIONAL

Deep Diving Beaked Whales Suffer The Bends

New research reveals that beaked whales dive deeper than any other air-breathing creature, yet can experience decompression sickness when diving in shallow water. The medium sized toothed whales can reach lengths of 4 to 14m and can dive as deep as 1,900m for up to 85 minutes.

The research funded by the U.S. Office of Naval Research and Woods Hole Oceanographic Institution (WHOI) was important because it is thought that naval sonar exercises may contribute to the whales' decompression sickness.

A study conducted by WHOI, the University of La Laguna in Spain, the University of Aarhus in Denmark, Bluwest and the Nato Undersea Research Centre in Italy focused on two species of beaked whales, Cuvier's



beaked whales (*Ziphius cavirostris*) and Blainville's beaked whales (*Mesoplodon densirostris*) in Italian and Spanish waters using a non-invasive digital archival tag or D-tag developed at WHOI by one of the authors, engineer Dr. Mark Johnson.

Whales of these two species have been found stranded in mass during naval sonar exercises. Results of the study suggest that the extreme diving of the beaked whales does not seem to put them at greater physiological risk for sonar exposure. However, their behavioral response to sonars seems to play an important role.

Scientists say more research is needed to learn more about this little understood species in order to prevent more incidents of accidental exposure to bay sonar.

SOURCE WHOI ■

Narwhals' song explained?

Marine biologists from Woods Hole Oceanographic Institute in the U.S. have found preliminary evidence that narwhals produce signature vocalizations that set individuals apart.

In a paper published in the September issue of Journal of the Acoustical Society of America, Ari Shapiro and colleagues write that these narwhal vocalizations by might facilitate individual recognition or their reunion with more distant group members. Narwhals are found in Arctic waters and can migrate thousands of miles in large numbers with subgroups moving in a coordinated fashion.

"Many unanswered questions remain about narwhals, and understanding their vocal communication will provide insights into their social behavior," said Shapiro. Shapiro said he also plans to study vocalizations and movements of free-ranging killer whales in Norway this November.

SOURCE: JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA. ■


NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Mapping East Africa's Dolphins

For the first time ever by the straits of Wasini, an international research body, Global Vision International, has set up base in the village of Mkwiro to study the dolphins. "There has been no research on dolphins off the East African coast," says Graham Corti, expedition manager with Global Vision International. "Hence there is nothing published."

"Our principal reason for partnership with the Kenya Wildlife Service (KWS) is to quantify our research on the dolphins," continues Corti. "Everyday, we patrol the area around Kisite-Mpunguti, and the peninsula of Shimoni and towards Funzi Bay," In total, this covers an area of about 100 square kilometres.

In the expediton are two KWS rangers going through the whole exercise. "We have KWS working with us. By training the KWS officers, we will be able to give KWS the tools to see the patterns of dolphin movement and behaviour. KWS can then use this information to base its management decisions on," says Corti.

The photo identifications and the Global Positioning System (GPS) recordings complement the surveys that record the impact of the tourist dhows on the dolphins' behaviour. "We watch how the dolphins breathe, as in do they take shallow or deep dives. We know from the shallow dives that they are passing through but when they take deep dives, they may be feeding."

Today, the impact of tourism is on the increase as more people travel globally to far flung areas of the world in search of new vistas. ***Nobody can doubt the importance of the tourist dollar. However, it is also more obvious today that if we do not manage our natural resources well, then even the tourist dollar cannot bring back the disappearing wildlife or degraded natural ecosystems.*** ■

Rare Dolphin's Breeding Area Discovered

A group of the rare Risso's dolphins including offspring was sited off the tip of the Llyn Peninsula of Bardsey Island in the UK.

Researchers from WDCS said the unusual sighting suggests that the location is a potentially important breeding area for the Risso's dolphins and more investigation needs to be made to understand the dolphins habitat use, information which can inform conservation plans to protect the species from extinction.

The research was funded by the Countryside Council for Wales' (CCW) Species Challenge Fund.

More information about the Risso's dolphins and the threats facing dolphins, whales and porpoises in general, please visit www.wdcs.org. SOURCE: WDCS/CCW ■


Risso's Dolphin, *Grampus griseus* WIKIPEDIA

Pollution And Ocean Debris Worse For Whales Than Hunting

A new study shows global warming and pollution will have a greater impact on whale populations than hunting. An estimated 300,000 whales, dolphins and porpoises die each year from entanglement in fishing gear, making fishing gear the single greatest human-related cause of cetacean mortality, according to the National Oceanic and Atmospheric Administration.

When whales get caught in lines, their ability to swim is hindered, which can result in drowning or vulnerability to ship collision. The lines also can impede the whale's ability to feed, leading to starvation, or can cause physical trauma when the skin is cut, leading to infection and death.

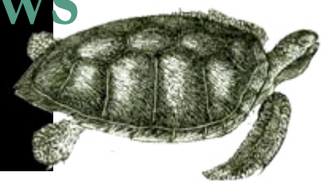
Meanwhile, researcher Mike Iliffe says commercial whaling issues are dominating the International Whaling Commission (IWC) at the expense of the real threats to the mammals and to the point where the polarisation of the pro-whaling and anti-whaling groups is making the commission dysfunctional.

"Pollution may be killing 10 to 20 times as many whales as the Japanese, the Icelandics, the Norwegians and the aboriginal whalers together are killing right now. The debate has been impoverished because of an excess of emotion over rational argument," Dr Julia Jabour added.

"When you listen to some of the arguments that the anti-whaling countries put forward they are based on cultural or moral high ground and I would suggest that that's pretty shaky ground to be on." ■

Turtle news

By
Kurt Amsler



"One is only willing to protect what one actually knows"

Author and world renowned photographer Kurt Amsler is the founder and primus motor behind SOS-Seaturtles

The Indonesian island of Bali has been known as a hub for the trade of sea turtle for over two decades. The buyers of turtle meat, shells and eggs are mainly found in the Asian markets as well as in Indonesia itself. The meat and eggs of the turtles are not meant for feeding the poor, rather they are status symbols in more affluent societies with turtle shells being used for jewellery and ornamental objects for sale to tourists. All of which are unnecessary objects, for which hundreds of thousands of turtles have to lose their lives.

All eight species of sea turtles are threatened by extinction and therefore under strict protection as set forth by CITES, the Convention of International Trade of Endangered Species. Nevertheless, the number of these magnificent animals—who have inhabited our oceans for over 150 million years—is dwindling. Until four years ago, in Bali alone, an annual average of 25,000 sea turtles were brutally cut out of their shells alive! As a result of several campaigns initiated by the Indonesian ProFauna and SOS-Seaturtles, this number has dropped to around 3,000 a year. However, as sea turtles are threatened by extinction, every single spared animal is important in order to preserve the population.

SOS-Seaturtle Campaign

Stopping The Killing And Trade On Bali

The brutal slaughter of sea turtles in Bali

The killing of sea turtles in Indonesia is more than just a national problem, it has already been decades since the local population of sea turtles in the Balinese waters collapsed. The animals now being butchered in Bali are caught all around Indonesia, Borneo, Malaysia, Sipadan and off Northern Australia. After months of grueling transportation, during which their front legs are pierced and tied up, the animals stacked on top of each other in the hull with no food or water, they finally end up in Bali. Herded together in cages, they await their horrifying end here before delivery to the national or international market.

The brutality of the killing is unimaginable: With a sharp knife the lower tortoise shell is separated from the upper one while the animal is still alive. Next, the butchers slowly disembowel the turtle without paying any attention to the unbelievable pain inflicted on the helpless and tortured animal. The agony can last up to half an hour—a total horror, when you consider that sea turtles have a highly developed nervous system and are unable to cry.

The new Campaign

The objective of the new campaign is similar to what we did the first time and it did work very well. With letters of protests, signatures and statements, we want the relevant authorities of Bali and Indonesia to be aware that people from all over the world will once more focus on Bali's sea turtles and call upon the government to stop their slaughter now and forever. At the moment, Indonesia and Bali are both struggling for every single tourist. Tourism is very important for their econo-

mies, and anything that may harm their image is subsequently taken seriously. This is the best leverage to obtain the full attention of the authorities, although we intend to use more pressure and less diplomacy this time. These are the necessary footsteps which allow the PROFAUNA members to put pressure an officials and police to crack down on the turtle mafia in Tanjung-Benoa. A so-called "Turtleweek" in Denpasar, the main town on Bali, with public statements and media conferences with visiting journalists and TV-crews from Europe and representatives of tour operators, is planned for April 2007.

Everyone can help

We have chosen a new, more updated means of communication to broadcast the present campaign and to transmit the signatures, statements and letters of protest. With the internet replacing the former brochures and petition sheets, everything can be done online! Everyone in the world will be able to get instant information about the the Seaturtles campaign through one mouse click on: **www.sos.seaturtles.ch**. Here you can sign petitions and e-mail pre-printed statements straight to the relevant government organizations. We are convinced that by these direct means of communication, we will reach far more people and therefore get more signatures and more statements.

Latest news from Bali

The new campaign was launched in March 2006. Numerous hardcover and online magazines have published articles and placed banners with direct links to: **www.sos-seaturtles.ch** on their homepages as well as diving manufacturers and enterprises that are related to the ocean. Until now the Governor of Bali has received more than 6400 letters of protest and statements from all around the world. As a result, the Indonesian Organisation ProFauna, which is supported by SOS-Seaturtles, can put more pressure on officials and police. Since this spring, several raids have taken place in Tanjung Benoa, the capital of turtletrade. Further details and images can be found on this webpage: **www.sos-seaturtles.ch/news-seite_english%20.htm**

This October a "big fish" was caught by the Balinese police. Thanks to a tip-off by of an investigator, ProFauna activists and the police confiscated a boat carrying more than 170 Green Turtles (*Chelonia Midas*) which were caught off Sulawesi and on their way to Tanjung Benoa to be killed and traded. The crew was arrested and the boat chained and detained in Benoa Port for further examination.

The Chief of the Bali Office Department, Irjen Pol. Drs. Soenarko Danu Ardanto, who personally supervised the seizure, ordered the turtles to be released back into the wild. The turtles were then measured and tagged by BKSDA Bali (Forestry Dept.). Unfortunately, three turtles were found dead due to the ordeals of the smuggling. The next day, the turtles were released in Kuta Beach under the protection of the police and coast guard assisted by Kuta villagers, ProFauna members, BKSDA Bali and numerous tourists who were enthusiastic to take part!

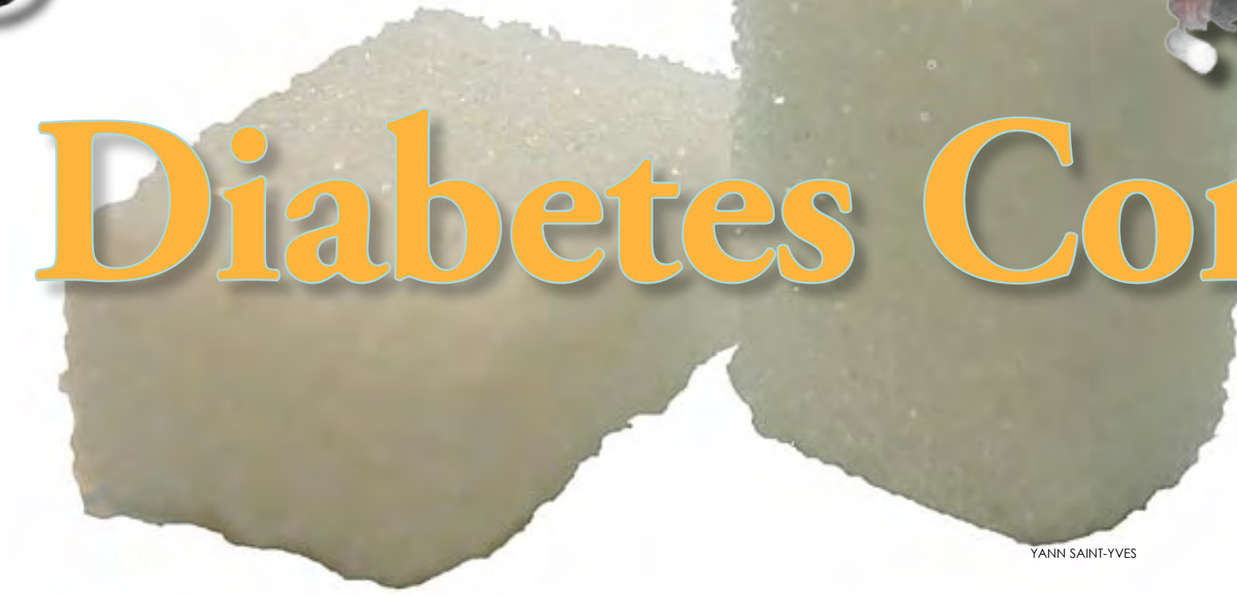
The release attracted hundreds of spectators and the ProFauna members took the opportunity to issue an official statement informing the people about the turtle slaughter and the illegal trade that still continues in Tanjung Benoa. Usually, protests against the turtle mafia were always heavily harrassed by the traders and turtle catchers, but this time nothing happened! That alone is a strong testament to the growing strength and recognition of the ProFauna organisation.

All that we have achieved since the start of the campaign proves that our policy work and our actions makes a difference. ■

Soon, hopefully, with your help, there be no more tears

PETER SYMES

The Diabetes Controversy



YANN SAINT-YVES

Diabetes ranks as one of the most controversial medical conditions affecting divers and has been the cause of heated debates worldwide for more than two decades. Traditionally, insulin-dependent diabetics have not been allowed to dive; however, the evidence supporting diabetic divers has increased dramatically in the last decade. The time appears ripe for a change in mentality.

By Thea Brolund
and Anders Tychsen

Disclaimer: Information and views in this article are those of the authors and should not be taken in place of the advice of a quaiifed physician. In all cases, please refer to your dive doctor first for appropriate medical recommendations on diving with medical conditions.

In the mid-1970´s there was a diving accident in the UK. The diver in question developed a sudden onset of decompressions illness and died. It was discovered that the diver suffered from diabetes, a chronic condition where the ability of the body to produce insulin is either diminished or lost entirely. As insulin is the hormone that allows the body to control blood sugar levels, and the treatment varies on an individual basis, diabetes can be a life threatening illness, if not treated properly. While in the concrete case there was no evidence that the divers diabetic condition had contributed to his demise, an international and complete ban on diving diabetics was imposed, with the exception of those diabetics who could control their condition by diet alone.

In the early 1990's, the case was re-examined, and a review of the post-mortem results showed that the diver had a patent foramen ovale, or a hole in the heart between the right and left atria. Whether this, his diabetic condition or a third factor caused the diving accident, remains uncertain. However, by that time one of the most heated discussions in diving and hyperbaric (diving) medicine to emerge had already been running for 20 years.

The problem associated with diabetics and diving is serious, because diabetes is a globally occurring condition that appears to be more and more common. According to the WHO, at least 170 million people worldwide have diabetes, and the figure is likely to double by 2030. As more and more people get diabetes, the numbers of diabetics who want to experience diving will increase.

Diabetes

The human body uses sugar (glucose) as fuel, which is derived directly from what we eat and drink. The hormone insulin, present in the bloodstream, is necessary for the cells to metabolize sugar. Insulin is normally produced by the pancreas; however, in diabetics, the ability of the pancreas to produce insulin is lowered or gone completely. Alternatively, the cells of the body can have a resistance to the entry of insulin. In both cases the result is the same: Glucose levels build in the blood and can reach dangerous levels, which can result in cells being starved of energy. Over time, diabetics can develop damage to their eyes, kidney, heart or peripheral nerves, if they are not well-regulated.

There are several different degrees of diabetes, and the illness varies from person to person. About 90% of all diabetics have what is commonly called Type II diabetes, and can control their blood sugar levels by diet and oral medicine. Typically, the pancreas of Type II diabetics still produces insulin, but at a lower rate. The remaining 10% are called Type I diabetics. In this group, the pancreas has completely stopped producing insulin, which means that the Type I diabetics need to get their insulin via injections of the hormone.

The risk of diving with diabetes

When diving, the body is usually quite active, depending on the conditions in question, and therefore uses sugar. Most divers, especially those diving in cold waters, will be familiar with the solid appetite a morning of diving usually builds.

For diabetics, the use of sugar during diving can constitute a problem if they for some reason start their dive with too low a level of blood sugar. This can happen if the diver has taken too much insulin before the dive, has been drinking alcohol or lacks exercise, has eaten too little or improperly. In these cases, diabetic divers run the risk of their blood glucose level falling to a level where hypoglycemia, or low blood sugar, is

precipitated. A hypoglycemia episode can, dependent on the severity, cause everything from mild headaches to weakness, tremor, sweatiness or chilling, irritability, alterations or loss of consciousness to convulsions. Needless to say, the extreme end of these effects is highly dangerous in a diving situation.

A convoluted problem

The risk of developing hypoglycemia has been the primary factor in the medical establishment having traditionally banned Type I diabetics from diving. Not only does a severe hypoglycemia episode endanger the diabetic, it can potentially endanger their dive buddies as well.

However, during the early 1990's it was gradually realized that hypoglycemia while underwater or on the surface appeared to be much less common than what was popularly believed. Furthermore, it was realized that the diabetics were diving despite the ban. Diabetics, already frustrated by the way society tends to view them as walking chronic conditions rather than human beings, which seems to be a common fate for people who have some sort of disability or other, basically disregarded the recommendation of the hyperbaric doctors. To back up their case, the predicted cases of hypoglycemic-induced diving accidents never materialized. A survey was carried out on diabetic divers, and this showed that none of these had suffered from an increased incidence of decompression illness, or more importantly, none suffered from hypoglycemic attacks while diving.

PETER SYMES

Our entire pharmacopoeia has its origins in nature....The importance of natural products for drug discovery cannot be overestimated, because we do not have the scientific capability to design drugs from scratch.

Janice E. Thompson

YANN SAINT-YVES

This caused a problem for the medical establishment. On one hand, the doctors lacked sufficient knowledge about diabetes and diving (i.e. the effect of pressure change on e.g. blood sugar absorption) to approve diabetics for diving, and on the other they did not want diabetics to dive without at least proper instruction in how to handle their condition. Furthermore, as many diabetics feared being banned from diving, they kept silent about their condition.

Early investigations

In 1992, the British Sub-Aqua Club (BSAC) decided to readmit Type I and other diabetics into the club, providing that they fulfill a set of strict medical criteria, including excellent control of their blood sugar levels through insulin injections. At the same time, data from diabetic divers started being collected in the UK.

In 1996, the Undersea and Hyperbaric Medical Society (UHMS) chaired a workshop focused on discussing the issue of diabetic divers. Researchers debated the evidence at hand and discussed the possibility of loosening the ban on divers with insulin-dependent diabetes. At the UHMS meeting, Divers Alert Network (DAN), an international diving safety organization, reported that out of 550 dive-related fatalities occurring from 1989 to 1994, seven had diabetes. However, whether their condition contributed to their cause of death was not clear. Furthermore, eight of 2,400 episodes of decompression illness involved diabetic divers. Both numbers were in line with the expected numbers in the general population, and therefore the statistics failed to show an increasing risk for diabetic divers. Furthermore, DAN carried out a survey in early 1996, where 164 diabetic divers replied. Of the 164, 129 were Type I diabetics—and

had participated in over 27,000 dives with no major complications. A few reported having experienced symptoms of hypoglycemia, but none reported the loss of consciousness that caused the ban on diabetic divers in the first place. Other studies were carried out, and e.g. the Camp DAVI project, carried out by Dr. George Burghen and Stephen Prosterman in the US Virgin Islands, reported similar positive results in detailed studies of 32 insulin-dependent divers.

In parallel with the new evidence on diabetes and diving, the medical industries had developed more effective insulin types and delivery systems. Including fast and slow-acting insulin types. While Type I diabetics in the 1970's used

ANDREY BIZYUKIN

YANN SAINT-YVES

measurements of the sugar level in their urine to calculate how much insulin they should take, modern equipment allows measurement of blood sugar directly, in as little as 30 seconds. This has facilitated unprecedented levels of control of blood sugar levels.

The ban is loosened

With the evidence slowly mounting in favor of the diabetic divers, several countries began lifting the band on diabetic diving, including the UK, USA, Sweden and Egypt. Other countries began to inquire about the standards utilized by these countries, including Australia, Holland and Denmark. In the countries that lifted the ban on diabetic diving around this time, medical guidelines similar to those used in the UK were enforced, which ensured that only fit, well-regulated Type I diabetics would gain dive clearance. Furthermore, standards and guides were developed to assist the diabetic, outlining e.g. how to ensure stable blood sugar levels before, during and after each dive. In general, these guidelines were developed in collaboration with the diabetic divers and based in part on their experiences and solutions; e.g. DAN, UHMS and BSAC all have protocols for approving diabetic divers. As of 2000, most countries still enforced the ban, however.

New evidence

From 1997 through 1999, DAN took to the field again, collecting data from more than 500 dives by insulin-requiring divers and a similar amount of control dives by divers without diabetes. There were no adverse effects due to diving on the diver with diabetes—even with 18 hypoglycemic episodes outside of the diving.

In 2001, a group of UK-based

PETER SYMES

doctors published the experiences with diabetic divers in the UK since the lift of the ban. Due to an excellent collaboration between divers and their physicians, the UK had amassed a substantial body of evidence on the subject, including data from 323 diabetic divers performing 8,760 divers over 11 years. In that time span, two fatalities were recorded, both in non-insulin dependent divers, and only one incident of hypoglycemia underwater in an insulin-dependent diabetic was reported. The study showed that in the group of well-controlled diabetic divers, there were no serious problems due to hypoglycemia when they dived; however, the study concluded that diabetics suffering long-term complications of their conditions, such as heart problems, should not dive. More evidence accrued, and was presented at the 2005 DAN workshop on diabetes and recreational diving. The workshop resulted in the publication of a set of standardized guidelines for allowing diabetics who use medication, to dive. The guidelines consist of 19 points, and include e.g. the requirements about the age and fitness of the diabetic, with one of the primary requirements being no hypogly-

About the author

Thea Brolund is a Type I diabetic, She is a multiple-award winning PhD-candidate at the School of Marine Biology at the University of Technology, Sydney in Australia. She is a diver with several years of marine biological scientific fieldwork behind her. She manages her diabetes through a combination of insulin injections and an AustralAsian Medical and Scientific Limited Animas 1000 insulin pump (the combination is often called the "un-tethered" approach, and is used by many active diabetics).

Brolund was the first Danish Type I diabetic to gain permission to dive, and presented her initial experiences at the EUBS 2003 hyperbaric medicine conference. She fought for a year to gain the same diving rights in Australia as in Denmark, and is currently a registered diver at two different Australian research institutions. She remains actively engaged in the effort to insure diabetics the right to dive globally. ■

cemic episodes, requiring intervention from a third party, within the past 12 months. Additionally, the diabetic should carry extra reserves of blood glucose with them during the dive.

The problem continues

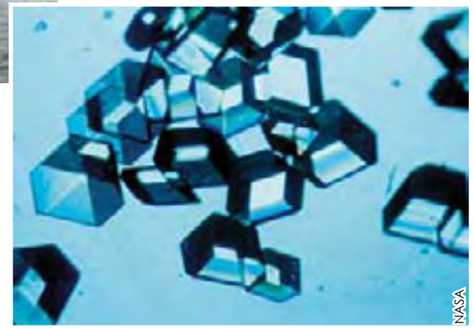
To the continued frustration of diabetics, the absolute ban on divers with insulin requiring diabetes remains under review and country specific, although more and more countries are lifting the ban. Strangely, the problem appears to be not so much related to the question of whether Type I diabetics are at increased risk when diving or not, but rather a question of responsibility.

Extreme sports, like diving and rock climbing, carry with them an inherent risk for the practitioner and those he or she climbs or dives with. However, traditionally most of these sports have not required any kind of medical clearance—i.e., there is none to prevent people from rock climbing, irrespective of any health problems. This may in part have something to do with the fact that the dangers associated with rock climbing are obvious and under the domain of common sense. The dangers associated with diving—nitrogen pressure, ear squeezes and similar however, need to be taught. Despite the obvious parallel between diving and other extreme sports, diving has always been associated with medical clearances given by doctors. This means that divers have fallen under a "paternalistic medicine" that tells them what they can and cannot do. Needless to say, diabetics, already plagued in this regard, have rebelled against this.

ANDREY BIZYUKIN

Scientific evidence points to the fact that the ban on diabetic diving was erroneously imposed

It is however too easy to blame the doctors, for the problem is complex, and related to the phrase "fitness to dive" which is what a medical practitioner must agree to when clearing a diver for diving. In some countries, the medical clearance of "fitness to dive" has achieved legal standing, and this means that the medical practitioner takes a very real risk of getting blamed in case something goes wrong with the cleared diver. On the other hand, the responsibility of declaring a person fit to dive can be delegated to the dive instructor. In both cases, the involved people develop a natural fear of accepting the risk. The problem with the situations is that the diabetic who actually wants to dive cannot take the risk upon himself—which is what a rock climber can do. With diabetic divers willing to take the risk of diving upon themselves, and practitioners of other extreme sports not having this problem, it is a valid point to ask by the divers, instructors and practitioners alike why so many countries still prevent diabetics from diving.



NASA

Insulin crystals

In summary, scientific evidence points to the fact that the ban on diabetic diving was erroneously imposed, and excellent collaborations between diabetics, medical experts and instructors have helped develop good international guidelines for diabetics who wish to dive. However, as yet many countries still in practice do not allow Type I diabetics to dive (e.g. Australia), and the diabetes controversy is like to continue with diabetics (and other groups similarly affect e.g. as reported for Australia by a study from 2002) diving illegally, and outside the ability of the medical establishment to monitor their situation, until the day that the ban is lifted in these countries. ■

Information on diabetes and diving

If you would like to know more about diabetes and diving, or if you are a diabetic who would like to know a bit more about how to avoid hypoglycemia while diving, the following links will provide basic information.

Safe Scuba Diving With Diabetes

– by Stephen Prosterman, of the Camp DAVI project
www.diabetesselfmanagement.com/article.cfm?SK=5WZ2&SID=9&SSL=n&AID=1017&page=1

DAN/UHMS guidelines

www.diversalertnetwork.org/news/download/SummaryGuidelines.pdf

The YMCA diabetic protocol

www.chesapeakebaydiving.com/Documents/diabetic_protocol.pdf

BSAC Guidelines

www.scuba-doc.com/endmet.html#Diabetes_and_Diving

... a couple of other medical tidbits

The Deep Sea Offers Hope For Cancer Sufferers

Bryostatin-1 is a promising anti-cancer drug that might also be effective againsts Alzheimers. It is made from a widely-distributed marine invertebrate, *Bugula neritina*, found worldwide in temperate waters and whose stringy brown colonies are sometimes mistaken for algae, often fouls boats' hulls. However, the drug only exists in small number of the organisms and have proven hard to harvest. But scientists at Sunderland University in the UK dicovered that the bryostatin is not only found in the animal, but also in the sediment around it on the sea floor of the Gulf of Mexico. Now the researchers are attempting to create a synthetic version in the lab and believe it could also be discovered on their own doorstep—in the North Sea.

Dr Lyn Noble, from Sunderland, said: "It is difficult to mass-produce the drug, but if we do manage to find a way to do that cheaply, the lives of literally millions of cancer and Alzheimer's sufferers worldwide could be changed."

It takes 14 tonnes of bugula to extract an ounce of pure bryostatin. Creating a synthetic form of bryostatin is a complex procedure, which takes 65 reaction steps as compared to the five to ten processes that are normally economically viable. Synthetic bryostatin costs £261 per 50 micrograms or £5.2 million per gram.

Research in the U.S., including a £4 million sea farm to harvest the life form, was hit when the colony was lost in a hurricane.

Now academics are trying a different approach. They believe bacteria on the creature is responsible for producing the bryostatin and are now trying to grow it in salt water.

If successful it is hoped that, with the help of Sunderland chemists, they will find a cheaper way of producing bryostatin in the lab and even harvesting it from the North Sea. ■

Scientists Isolate Anti-Malaria Compounds From Mussel

Indian scientists have isolated two compounds from mussels that have been found to have anti-malarial activity. Malaria kills more people than any other communicable diseases except tuberculosis.

The molecules, named NIO-1 and NIO-2, have been disocvered by the scientists at the National Institute of Oceanography. Studies have shown that the two compounds act by directly killing the malaria parasite, *Plasmodium falciparum*, rather than just causing inhibition of their growth. Importantly, the compounds were found to be non-toxic to human cells. The compounds, already patented, are cheap to obtain and can be prepared in bulk without killing the mussel. ■

All photos courtesy of the manufacturers

POINT & CLICK ON BOLD LINKS

Holiday Gifts

Stuffers for Really Big Stockings...

Immersion

Ladies Storm Blue Watch One of the best looking watches on the market in our opinion, made from marine grade stainless steel with a slightly transparent segmented polyurethane strap. Uni-directional bezel for dive timing. Water resistant to 200 meters. **shop.scuba.co.uk**

Trinkets from the Sea

Does she love the sea? How about the loving seahorse? Be her valantine and let your love be known. Fine exquisite 14k gold pendents from Big Blue's Seaplicity collection here: **www.bigbluedive.com**

Dasher, Dancer, Prancer, Fiipper?

Give her the gift of gold with this delicate pendant showing three dolphins leaping. Handcrafted in 14k gold by Lloyds. Find it at: **www.lloydslimited.com**

Diversitea's

Superfood Survival Kit Coming up for air and starving? Avoid the temptation of unhealthy breakfast and snack choices while diving. Try this convenient care package designed for divers. Contains: one trial size bottle of Vitamineral Green, a great vitamin and nutrient rich meal replacement when mixed with fruit juice or added to a Smoothie (10 to 15 servings in per bottle); six Raw Crunch® bars—a delicious seed and nut-based nutrition boost bar (uncooked, unprocessed, free of artificial supplements, colors, flavorings and preservatives)—can stabilize your blood sugar and control your appetite naturally; one box Giant Quart Size Original Blend Diversitea (makes 6 Quarts); one 34 oz Diversitea Cold-Brew Sport Bottle; one box Sunset Blend Diversitea, containing 24 individual teabags for brewing up to relax at the end of the day. Comes in a transparent full size Opti-Dry Drybag for carrying a towel and other items you want along on the trip. You just have to ADD WATER! **Diversitea.com**

CHRISTMAS ISLAND TOURISM ASSOCIATION

Want a little Yuletide adventure?

Why not discover the Sea Caves of Christmas Island where the ocean waves have eroded the limestone cliffs and exposed numerous caves that provide exhilarating diving. Inside Thunder Cliff cave, divers can surface into a huge air-filled dome adorned with wonderous stalagmite and stalactite formations. See: **www.christmas.net.au** and **www.diveadventures.com.au**

Gotta dive?

What to do when you get up and freeze in the breeze? How about a Ragz Pullover and hat? These wonderfully soft pullovers are designed from a lightweight chamois swim towel for people who love the water. They are comfortable, warm and cozy, block the wind instantly and get softer each time you wash them. Comes in Coconut, Mango and Ocean Blue. Priced: US$69.00. Hats: $24.00 **Ragzpullovers.com**

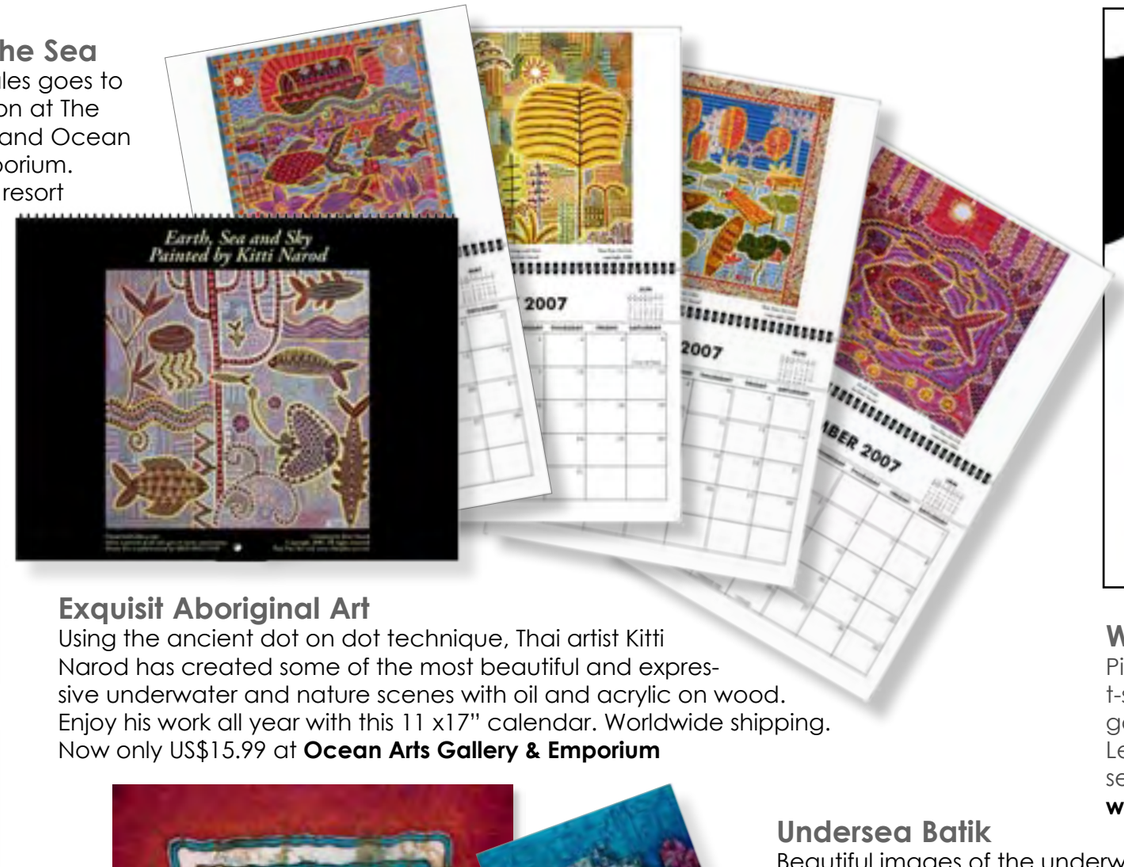
Holiday Gifts

Give Back to the Sea

A percent of all sales goes to ocean conservation at The X-RAY MAG Store and Ocean Arts Gallery & Emporium. Are you a shop or resort who wants to give back too? Contact Percent for the Oceans at: **gsymes@xray-mag.com**

Laugh your head off all year round!

Give the gift that keeps giving chuckles month after month. These hilarious dive cartoons by Canadian syndicated cartoonist, Ralph Hagen, were created exclusively for X-RAY MAG by the talented diver with wacky humour. Worldwide delivery. Bulk discounts available on 15 or more. Calendars now on sale from US$7.19 and up. Mousepad: US$15.99. Tile coasters: US$8.99 **The X-RAY MAG Store**



Exquisit Aboriginal Art

Using the ancient dot on dot technique, Thai artist Kitti Narod has created some of the most beautiful and expressive underwater and nature scenes with oil and acrylic on wood. Enjoy his work all year with this 11 x17" calendar. Worldwide shipping. Now only US$15.99 at **Ocean Arts Gallery & Emporium**

Wetpixel / Divester T-Shirt

Pick up this new design on a cool black t-shirt for your dive buddy offered by our good friends at Wetpixel and Diverster. Learn more about their information and services for underwater photographers. **www.wetpixel.com** or **www.divester.com**

Undersea Batik

Beautiful images of the underwater world created with the ancient techniqe of using die and wax on silk, Wisconsin artist, Sue Duda, a diver and ocean lover has tales to tell in her undersea batik images. Lovely decor for home or office. Designs come on framed and unframed prints, pillows, scarves, shower curtains, tablecloths, tiles, t-shirts and more. From US$8.99 and up. **The X-RAY MAG Store** and **Ocean Arts Gallery & Emporium**

X-RAY MAG T's

Our cool black T now comes in new colors like Cardinal, Navy, Military Green crew necks and white golf shirts too. Buy the t-shirt that tells the world you support the oceans and cutting edge dive journalism in a wide screen magazine that's free and independent. Just $23.99 at **The X-RAY MAG Store**

Funny Dive T's

Get your hot new thigh slapping Ralph Hagen dive cartoons on t-shirts for men, women and kids. From US$12.99 and up. Worldwide shipping. Bulk discounts for orders of 15 or more. **The X-RAY MAG Store**

Holiday Gifts

Burundi Princess by Jean Lamy, oil on board, 70 x 54 cm US$1262

TOP: Detail from *Reef Fish 1* by Gary Jenkins 12 x 16" print US$75
BOTTOM: *Fire Water* by Cate Larkin 12 x 12"print US$75

Queen of the Sea by Sue Duda 12 x 14" print of original batik US$50 is great on pillows too

Maui Madness by Jill Saur 32 x 40" print US$370
also looks fabulous on a large tablecloth for your dining room

Surround Them With the Sea...

Give the gift of Ocean Art and support ocean conservation at the same time! Divers who love the ocean also enjoy remembering their underwater journeys while topside with art inspired by the sea for their homes and offices. Here is a sampling of what you can find at Ocean Arts Gallery & Emporium where a percent of all sales goes to ocean conservation. Private collectors and designers of dive resorts, boutiques and shops will find wonderful originals and reproductions on canvas and archival watercolor paper by artists from around the world. Many are available in three sizes from 12 x 14" to 32 x 40". Prices from US$43.00 and up. Soon to come: Many designs from our participating vendor, Gallery Street, can be ordered on home decor and gifts such as pillows, scarves, tablecloths, placemats and greeting cards. You can even dress up your bath with fine art printed on a shower curtain! **www.oceanartsgallery.com**

Island by Philip Sybal
15 x 22" print US$350

Swimmers in the Pond by Susan Allen, original egg tempura painting, 25 x 23 cm US$358

Anchors Away by Gleb Nazarov, 12 x 15" print US$155

Boat on Ladder by Vladimir Boderenko, 12 x 16" print US$155

Sailing Waves by Tolick Yanev
12 x 16" print US$155

I Ching by Sydnie Irby
12 x 16.5" print US$43

Shark by Barry Nehr
12 x 16" print US$75

Timothy of the Coral Sea by Shawn Brasfield 12 x 16" print $85

Leigh Cunningham

The popular appeal and perceived machismo associated with deep dives tends to lure unsuspecting novice divers to depths beyond the capacity of their equipment, knowledge, skill, and physiology.

Do it Right

ADAM BUTLER

Depth has been an allurement since humans first ventured into the underwater world.

Something I find surprising in the 21st century is the amount of divers that have had no formal training below 40 meters, which chose to conduct dives regularly beyond this depth going to 50 or 60 meters on air and in some cases even deeper.

We can't help it. Depth has been an allurement since humans first ventured into the underwater world.

In 1943, soon after development of the first modern Aqua Lung, Frederic Dumas dived to 61.5 meters breathing compressed air. In 1947, Cousteau's team (formed in 1943) made experimental compressed air scuba dives to 90 meters. A decade on, Andrea Doria dives become popular for the few at the cutting edge, in July 1956, Peter Gimbel and Dumas made the first dive to the sunken luxury liner, off the coast of New York. Two weeks later, Ramsey Parks, Earl Murray, Bob Dill, and Peter Gimbel filmed the sunken vessel for Life magazine. These pioneering scuba divers used compressed air scuba at a depth of around 75 meters for these dives.

In his day, Jacques-Yves Cousteau did not have many options but to learn about deep diving from his own experiments. You do...

In 1967, Hal Watts made a record compressed air scuba dive to 118 meters, and in 1968, Neal Watson and John Gruener reached 132 meters. More recently (1989), Bret Gilliam completed a series of air dives in excess of 90 meters with an unofficial record dive to 136 meters, later pushing his air record to 144 meters.

In more recent years (1999), Mark Andrews conducted a series of deep air scuba dives in the Philippines, breaking Bret's air record with a dive to 156 meters.

In years gone past to present time, the seductive appeal of being a pioneer or explorer has driven individuals to the edge of physiological boundaries. This decade, however, a growing controversy and probable consequences involved with planning and attempting depth records, has deterred more record attempts using air as breathing medium.

Meanwhile, a better understanding of helium and decompression and the physiological and psychological effects of gases under high pressure, led a new breed of deep diving pioneers—now using trimix—to once more push depth limits, to set cave penetration records and going to the edge of their physiological, skill and equipment capabilities—and some times beyond.

Pioneering deep mix diving

In 1994, Jim Bowden dived to 287 meters breathing Trimix in a sink hole (cave) in Mexico, claiming the open circuit depth record. Unfortunately, his dive partner and renowned cave diving pioneer, Sheck Exley, did not return alive from this dive. Then, in 2000 the late John Bennett broke Jim's record with a dive in the Philippines to 308 meters. In turn, in 2006m Nuno Gomes broke John's record with a dive in the Red Sea to 318 meters, a record set only too see Pascal Bernebe go to 330 meters off Corsica, France, only a few weeks later.

Spectacular as all these records might be, the popular appeal and perceived machismo associated with deep dives tends to lure unsuspecting novice divers to go to depths beyond the capacity of their equipment, knowledge, skill, and physiology.

Training!

For four decades, training agencies have educated the general diving public in the art of non deco diving to a maximum depth of 40 meters. For the past two decades, technical training agencies have been set up specifically to educate and certify divers in the art of deep, decompression diving to a maximum training depth of 100 meters.

Nonetheless, it appears that it is an everyday occurrence that countless recreational scuba divers exceed their sanctioned depth limits—fortunately, without notable adversity—and that technical divers go beyond their means too. The main difference between the recreational diver wanting to go to 60 meters and the advanced Trimix diver with his/her sights set on 150 meters is the fact that you can be trained to dive to 60 meters, whereas, there is no sanctioned training in place to qualify you to

Do you want to go below 40? Go back to school. There are plenty of training agencies offering technical diving courses

For many divers, perhaps you included, the opportunity to make a deep dive (below 40 meters) is the highlight of a tropical holiday on a dive safari or cruise

go beyond 100 meters. The technical diver aspiring to do so is left to gain experience and only gradually increase depth in order to retain as much as the safety that would have at less than 100 meter.

The recreational diver, on the other hand, can enroll in a variety of sanctioned courses to gain required knowledge and skills to safely plan and conduct dives down to 40 meters—and once they are ready and capable to go beyond that, there are several organizations offering technical training. So, why not go for the training options on offer, and encourage safer diving practices?

Unsafe practices are way too widespread

For many divers, perhaps you included, the opportunity to make a deep dive (below 40 meters) is the highlight of a tropical holiday on a dive safari or cruise. Since there is no mandatory record keeping and reporting requirement for recreational divers, accurate documentation is hard to obtain. However, one recent study and analysis of 77,680 recreational dives made by clients on a diving cruise ship suggested that 25% of the documented dives conducted went beyond 30 meters. Forty percent of the divers using computers in this study (accounting for more than 44,000 dives) admitted to exceeding the 40-meter depth limit, and some dived in excess of 60 meters. During this same study, the professional staff of the cruise ship made more than 600 air dives to depths up to 75 meters. However, none of the divers in this survey had any form of formal sanctioned training in diving below 40 meters. That's not a pretty picture of safe diving practices as they appear today.

Why so many divers trained only to 30 or 40 meters would regularly plan to make 60 meter dives without proper training when it is so readily available, seems both illogical and is a cause for concern.

The community of deep technical divers who have the highest level of technical training on offer is very small, but it is not meant for everyone to go there.

In 1943, when Cousteau formed his team of divers, they had no bench marks as no training agencies existed and there were no NOAA or Navy studies to draw on. They had to do their own experiments and studies, they were forced to be pioneers with all the inherent risks.

That is not the case any more. Now other and better options are readily available. But as more divers conduct dives below 40 meters and or dives requiring decompression stops without appropriate formal training, they lead the way—setting an unfortunate trend for more divers to follow.

Be a good role model... do the right thing and dive safe staying within your limits. ■

Do it right

media

Books Film DVDs CDs

Edited by Peter Symes
& Gunild Pak Symes

POINT & CLICK ON BOLD LINKS

Dolphin Journey

by Erin Anne Pyne
AGES: 9-12
PAPERBACK: 132 pages
PUBLISHER: iUniverse, Inc. (March 16, 2004)
ISBN: 0595314066

A tale for kids that let them dive beneath the waves on a Dolphin Journey to experience an adventure through the young dolphin Serena's eyes. Separated from her nursery by a storm, Serena embarks on an adventure of danger and wonder with her three young friends alone in the big blue sea without adults to help guide them back home. They fend off fishing nets called Tanglers and make up an Epic song so no other dolphins will get caught in them again. As they travel around Australia, Japan and east to Hawaii, the friends fight sharks and other dolphins and near starvation. They meet all kinds of humans good and bad along a journey which tests the friends' loyalty to each other. Just when Serena thinks all the dangers are behind her, there is the greatest peril yet to come!
www.amazon.com

Dive Zero DVD

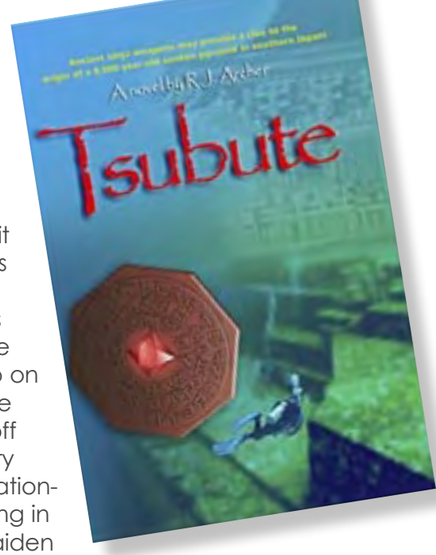
ISSUE #1: US$15.95. NTSC format. FREE shipping worldwide.
ISSUE #2: MySpace members can now receive $2.00 off the purchase of a Dive Zero Issue #2 DVD, valid from now until Dec 25. Just email your MySpace account and join the Dive Zero MySpace group before you purchase the DVD.

Dive Zero DVD Issue #1 is the premiere DVD filmed in High Definition. Includes eight sections: 1) A Day In The Life: Justin Bongers, Underwater Videographer, Grand Cayman; 2) Spot Check: Pavilion Lake, BC—one out of only three freshwater coral lakes in the world; 3) Tricks and Tips from the pros: Setting up gear, mask recover and replacement, mask flood, how to blow those awesome bubble rings and do the frog kick; 4) Hot Spot: Diving the Kettle River rapids in BC—lots of fish, cliff jumping and drift diving; 5) Mixed Tape: The Wreck Specialty—diving the *Doc Polson* in Grand Cayman with Ryan Lohr. Facts on how, why and where the wreck diving specialty is a must; 6) Danger Zone: Wakefest 2006, Wakeboarding and Freestyle Motocross montage; 7) Tune Up: Gear review by the pros—bcd's, regulators, dive watches and the recently popular shoes with holes enough to shame Swiss cheese; 8) Paradise: Two weeks in Grand Cayman—best activities, night life, sports and best dive spots—includes extra footage from a year filming in Grand Cayman. Funny bonus section ends it all. Also available, One Year American Subscription, Issues #1-4, PRICE: US$49.00; Candadian PRICE: US$39.00; International PRICE: US$59.00.
www.divezero.com

USS Oriskany DVD

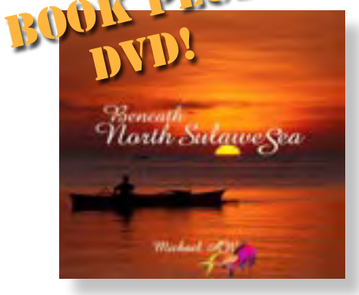
PRODUCER: ClearVis Productions
DISTRIBUTOR: International Training, Inc.
RELEASE DATE: end of 2006

USS Oriskany CVA34 – Status Report 06.19.06... With a title like this, it's gotta be good! This new DVD released by ClearVis Productionsfeatures the biggest vessel ever to be intentionally sunk to create an artificial reef. At 910 feet or 277 meters, the ship rests at a depth of 67m making it one of the best advanced and technical dives in the world. The high resolution video offers 75 minutes of footage including the actual sinking of the craft, dive footage in the nager space at a depth of 52m and the U.S. Navy's animations of the sink plan. There is no narration, but a sound score accompanies text-based information stills covering important details. Also available are sellected video clips and out-takes, preparation and archival photos. Free DVD available for dive shops. To order, contact: **Bill@SoutheasternTechnicalDivers.com**



Tsubute

by R.J. Archer
PAPERBACK: 248 pages
PUBLISHER: NWIDI Press (2006)
ISBN: 0977910911
Seeds of Civilization presents another adventure novel with a Sci-Fi twist to it by R.J. Archer. Each book in this series explores a different ancient mystery in a search to find the lost civilizations of old—and perhaps the origins of the human race. This time, four friends go on a trip to southern Japan to investigate the mysterious underwater pyramid off the coast of Yonaguni Island. The story involves a case of murder and international kidnapping. With a dramatic landing in the Aleutian Islands of Alaska, the maiden voyage of the team's newly acquired Learjet begins and, after a run-in with Japanese agents from the Department of Justice in Tokyo, the team starts to think they should never have left home. But a Japanese-American exchange student befriends them when they reach Yonaguni, and helps familiarize them with the small island of 1,200 people—as well as the dark secret hidden there. An ancient Ninja throwing object called a tsubute discovered outside the NWIDI headquarters in Seattle reappears on Yonaguni. This leads the team to a shocking discovery about the true nature of Yonaguni island and its indigenous people. **www.amazon.com**



Beneath North SulaweSea

Book and DVD by Michael Aw
HARDCOVER: 138 pages
PUBLISHER/PRODUCER: OceanNEnvironmet Ltd Australia
Limited Edition DVD/book set priced: US$68.00 / AU$90.00
Journey with award-winning underwater photographer, Michael Aw, to underwater volcanoes, gently brushing past giant sea fans and diving into the middle of giant schools of barracuda and trevally. This is underwater Sulawesi as only Michael Aw can capture it. The region is the most diverse marine ecosystem on Earth. No less than 698 still images and video scenes artistically woven into an unique presentation makes up the moving pictures DVD edition, all accompanied by an original sound score created by award-winning composer Eric Bettens. Part of the proceeds from this production goes to OceanNEnvironment's SOS funds to support research and conservation projects in the Indo-Pacific. The imagery from this production is photographed entirely from the North Sulawesi peninsula including Bunaken Marine Park, Banka, Sangie, Ruang, Siau and the Lembeh Strait.
www.michaelaw.com

EDWIN MARCOW

Medical Check Up for Ralph the Whale Shark

Ralph, one of two male whale sharks housed at Georgia's Aquarium had a medical check up! With 600 gallons of anaesthetic, 50 staff, and a team of 20 divers used nets to guide the 22-foot shark into a giant stretcher, which hung from a gantry. Ralph was subjected to two hours of medical examinations including blood and DNA tests.

Hormone levels were checked, too, to ensure Ralph was growing into a healthy adult. Ralph and his buddy first came to the aquarium in 2005 from Taiwan and were soon joined by a pair of female whale sharks, Trixie and Alice, in June of this year 2006.

Could love be blossoming beneath the waves between the boys and girls? ■


UNDERSEA EXPLORER

EDWIN MARCOW

Sharks Make a Meal of It!

The recent death of a young humpback whale in the waters of Holualoa Bay on the Kona coast Hawaii and subsequent feeding by sharks, has prompted local officials at the Department of Land and Natural Resources to use caution in these waters. The whale's carcass and the sharks had drifted within 125 yards of the shoreline before being towed out to sea. This type of incident has also been documented in South Africa a number of times most famously, or infamously, when Chris Fallows jumped onto the body of a large whale carcass, and with camera in hand, took images of Great White sharks tearing off large pieces of whale meat and blubber before getting back into his boat. ■


NOAA

Super Size Me!

San Diego - The *MV Islander* has reported back from a recent trip to Isla Guadalupe that they have entered into the time of 'The of Titans". Luke Tipple, Dive Operations Manager, reported two 17-foot female Great White sharks most likely weighing in at a staggering 2,500 pounds per shark. Of course, all the crew at Shark Diver were thrilled with these new arrivals. CEO Patric Douglas stated, "*We've been documenting the arrival of much larger sharks in late October and early November each season, just around Halloween each year.*"

This begs a question from the other side of the world. In Australia, Michael Brown has a theory: As sea temperatures rise globally, will the number of shark scares rise expositionally? There has been a rise in shark alarms in Australia from 124 in 2004 to 171 in 2005 for the last financial year. It has been documented that baitfish are swimming even closer to Sydney beaches, closely followed by the sharks. If this is linked to rising sea temperatures, one day could we have gigantic Great White sharks visiting the shore of Mexico and California? ■

As sea temperatures rise globally will the number of shark scares rise expositionally?

Kissing Sharks

Dave Marcel, a dive instructor who works at Capt Slate's Atlantis Dive Centre in Key Largo Florida, went in for a kiss and got more than he bargained for. The dive centre was in the middle of their weekly Creature Feature were you get to see Dave feed and play with Goliath grouper, Moray eels, and Nurse sharks. Picking up a juvenile Nurse shark, Dave turned it up side down and gave it a kiss. A decision that left him requiring hours of reconstructive surgery as the small shark sank it's hundreds of minute teeth into his top lip lacerating the soft flesh!

"You kind of pick them up, rub their belly, scratch them and hug them during the Creature Feature," said Marcel. "You might as well give them a smooch while you're out there."

Though Marcel has done this hundreds of times before, he picked the wrong girl to kiss this time. When I was about 13, I had a prized sticker that read, **"Be kind to animals kiss a shark!"** Maybe Marcel kissed one too many. ■

WWW.CHINESEFOODDIY.COM

Fished Out For Fin Soup

It has been reported to the United Nations Food and Agriculture Organization that between 26 and 73 million sharks, weighing up to 2.29 million tonnes, are killed for their fins each year. These fins are then made into shark fin soup that costs up to $100 per bowl in Chinese restaurants.

This is up to four times more than were the accepted numbers stated—no doubt on the rise due to the demand for shark fin soup!

Dr Shelley Clarke of Imperial College stated, "Our findings confirm that a far larger number of sharks are being caught every year than current databases indicate. The fin trade is continuing to expand and thus the pressure on shark populations is constantly increasing." In this barbaric finning, live sharks are hauled aboard, their fins are removed and the shark is then tossed back into the ocean to die a slow and painful death from either suffocation or they become prey for other sharks. Species most at risk are the blue shark, hammerheads and silky sharks.

The World Conservation Union has stated that 65 out of the 373 known shark species are currently threatened largely due to the trade in shark fins, and with fish populations in decline coupled with tighter regulation, some fishing industries are turning to sharks as an alternative catch. Depressingly, some think this number could be higher. This is because many fish are caught by unregulated fisheries that do not report their catches. ■

Bits & Bites

Edited by
Daniel Beecham
& Jason Heller

JASON ISLEY/SCUBAZOO.COM

S.Enderby filming a Californian sea lion during Monty Hall's Great Ocean Adventure II, La Paz, Mexico.

ScubaZoo
— making a living out of a dream

By Daniel Beecham

Many people dream of one day making a living out of underwater photography or videography, few people ever make this dream a reality. There have been only a handful of underwater cameramen or film crews who have made a name for themselves through underwater imaging. One group that has, goes by the name: Scubazoo…

SIMON ENDERBY/SCUBAZOO.COM

MATTHEW OLDFIELD/SCUBAZOO.COM

◄ The full Scubazoo team, September 2006

For years now the Scubazoo team have dedicated their lives to documenting the underwater world through moving and still images. In a relatively short time, they've amassed an extensive library of underwater footage and still images. Because their main base is located in South East Asia, one of the planet's most biologically diverse area's, their cameramen can be in the water 365 days a year, allowing them to see creatures and behaviour that has rarely, and in some cases, never been filmed before. This has made their library an invaluable resource to supply producers, publishers, and researchers with underwater material that makes potential productions a reality.

Matthew Oldfield in the cage during Killer Shark Live/CH5, Guadalupe, Mexico

Scubazoo is also heavily involved in work with various production companies including National Geographic, Discovery, Animal Planet, BBC, IMAX and ITV, contributing to various projects ranging from television commercials to conservation projects, promotional productions and exploratory research assignments. Few film crews have filmed such numerous subjects in such a wide variety of locations. From Saltwater Crocodiles in Malaysia, to Giant Octopus in Canada, Great White Sharks in Guadeloupe and the great Sardine Run in South Africa, the Scubazoo crew have been there, done that and made the T-Shirt!

Saving the Seas

What make's the Scubazoo team so special is that much of their work rotates around a strong conservational message; they strive to create a higher level of awareness of the earth's marine environment, and the importance and need for its conservation and preservation for the future. This only comes through each individual team member's love and appreciation for the marine world.

Scubazoo are currently producing their own unique genre of underwater documentaries. With their stunning images, they hope to be able to tell 'The Whole Story' of the underwater world.

ScubaZoo

S.Enderby filming a mola mola during Monty Hall's Great Ocean Adventure II - Bali, Indonesia

ROGER MUNNS/SCUBAZOO.COM

JASON ISLEY/SCUBAZOO.COM

Jason Isley & Simon Enderby filming salt-water crocodile for Jeff Corwin series, Animal Planet. Sabah, Malaysia

MATTHEW OLDFIELD/SCUBAZOO.COM

fascinating and complex web of life, Scubazoo's stories will always aim to have a strong conservation message. Continuing the conservation theme, Scubazoo recently released their coffee table book, *Sipadan, Mabul, Kapalai – Sabah's Underwater Treasure*, a publication detailing the rich marine environments found in and around these islands, and the threats they now face.

With such a wide variety of work under their weight belts, its more than likely you've seen Scubazoo's footage at one time or another. Some of their recent credits include 'Smart Sharks – Roboshark', 'The Really Wild Show', 'Killer Shark - Live', and 'Great Ocean Adventures' with Monty Halls.

The continued success of the Scubazoo team should act as inspiration to budding 'would-be' cameramen. Many individuals strive to achieve the status of professional underwater image maker, but become disillusioned by the industry and the challenges it faces. Let Scubazoo set an example, that there still exists opportunities in the industry, whilst also being able to make a positive difference to the oceans that we all love so much. ■

S.Enderby filming green turtle, Sipadan, Malaysia

R.Munns, S.Enderby and J.Isley having a quick briefing with the director in between dives. Killer Shark Live/ CH5, Guadalupe, Mexico

Sea & Sea DX-D80 Underwater Housing for the Nikon D80

Sea&Sea of Japan unveiled their new DX-D80 housing for the Nikon D80 digital SLR camera. It sports some mighty bells and whistles. The compact housing of this new model, which has an underwatershutter lever that features a leak sensor, makes it easy for divers to hold the camera while submerged. The front case, which is made of aluminum alloy, is corrosion-resistant. The rear case is made of polycarbonate and the grip is aluminum die-cast. The housing weighs 2.7 kilograms. Price: JPY 220,000 or approximately US $1,850

NEW Nexus: Fiber Optic Sync Ports and 45° Viewfinder

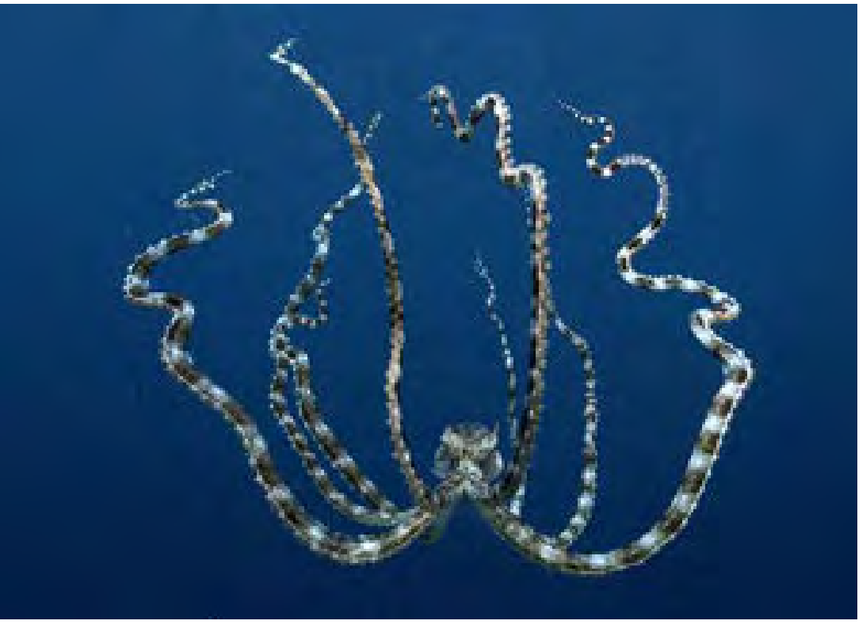
What's next at Nexus? Fiber Optic Sync with TTL to the Nikon D80, D200 and Canon 5D. A Pop-up flash on top of the camera is used to trigger the external strobe via a fiber optic cable. Sea & Sea and Inon strobes will have this option. Dual fiber optic ports are now available as well as the Inon 45-degree viewfinder by special order. Benefits of this finder includes an increase in the image coverage and enlargement enough to see fine focus as well as all the internal data display of camera information in the camera's finder. When in a vertical framing position, the Inon finder can also rotate to enhance viewing. Regulator exhaust bubbles in front of your mask are no longer a bother with the 45-degree angle of the finder and low-angle photography of critters on the sea bed or under low ledges becomes a breeze. Can be custom-fitted to the Nexus Nikon D200, D2x ,D80, Canon 5D and 1Ds Mark2 housings.

Fantasea Line FS-5 Underwater Housing for Nikon Coolpix S-5 & S-8 Digital Cameras

Designed for the ultra-slim Nikon Coolpix S-5 and S-8 digital cameras, the FS-5 housing is included in Fantasea's new generation of fully functional Coolpix housings. Access all essential control functions with this housing, which is ideal for outdoor and underwater photographers who want automatic exposure features for getting fast action shots easily and creatively. Compact design allows for easy handling and accurate access to camera functions via critical placement of push-button controls. Protects Coolpix cameras from dust, water, sand and other damaging elements. Built in Flash Diffuser and an anti-glare hood over the LCD screen. Additional features include: Zoom, Macro, Flash, White Balance, Exposure, Mode, Menu, Review, Delete, Video/Still Image Control switch. Maximum work depth: 130 feet/40 meters. Complementary Accessory Systems allow users the possibility to further enhance their imaging capability. Price: $200.00. Flood Insurance available through Fantasea gives underwater photographers peace of mind.

photography news

Beast of the Sediment by Göran Ehlmé of Sweden took this winning shot of a walrus feeding on clams taken off northeast Greenland. The image of the magnificent animal captured the Shell Wildlife Photographer of the Year Overall Winner award for Ehlmé in 2006 whose picture was voted as being the most memorable and striking of all the competition's entries. NOTES: Nikon D2x with 12-24mm lens; 1/50 sec at f4; 400 ISO; Seacam housing with wide-angle port



And the award goes to... The Great Mimic by Michael Aw

X-Ray Mag Contributors
Making Waves

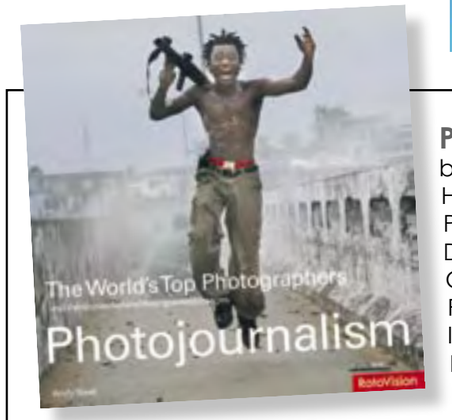
2006 has been a good year for Michael Aw named the Shell Wildlife Photographer of the Year in underwater photography and capturing the Best Picture Award at the BBC Natural History Museum.

Aw's remarkable image of the mimic octopus, famous for being a brilliant master of disguise, has won the Sydney-based photographer the underwater category in the prestigious Wildlife Photographer of the Year 2006 competition. Michael's stunning image was featured with 91 other amazing images in the Wildlife Photographer of the Year 2006 exhibition at the Australian Museum from 9 December to 18 March 2007. The exhibition is now in its 42nd year and showcases the commended and winning images from the largest wildlife photography competition in the world, attracting over 18,000 photographs from 55 countries in 2006.

The image of the octopus was taken while Aw was diving off Banka Island, Indonesia. He saw what he thought was a strange-looking eel moving along the sea bed. He followed it as it hunted for prey in the sand and watched the animal shift in shape mimicing various sea creatures such as sole, ray and even sea snake. What he was actually following was the Indo-Malayan mimic octopus seen in the shot wearing its usual brown and white stripes. It is a very intelligent animal and can figure out which dangerous marine animal to imitate to ward off any predator. Recently discovered in 1998, the octopus has a repetoire of hunting and hiding disguises including hermit crab, sand anemone, jellyfish, sea cucumbers, crinoids, blennies, lionfish and jawfish.

Aw is a big fan of octopus and says he has given up eating them a long time ago.

PHOTOGRAPH NOTES: Nikon D2X with 12-24mm lens; 1/100 sec at f14; 160 ISO; Seacam housing, single S200 Ikelite strobe. For more information, please visit: ***www.michaelaw.com*** ■



Photojournalism
by Andy Steel
HARDBACK: 176 Pages
PUBLISHER: Rotovision
DATE: October 2006
CO-EDITIONS: Dutch, USA, Italian, Russian, Estonian, Hungarian
ISBN: 2-940378-05-3
PRICE: GB£25.00 / US$34.95

X-RAY MAG's own Shark and Adventure editor, Edwin Marcow, has been published in a new book, *Photojournalism: The World's Top Photographers and the Stories Behind the Greatest Images* by Andy Steel and published by Rotovision. This awe-inspiring book showcases the very best photographs of images that define our era from around the world. It is thought provoking and offers a compelling record of some of the critical moments in recent world history. While the images speak for themselves, the photojournalists who work so hard to capture these images often go unnoticed. This book honors the portfolios of the world's leading photojournalists, celebrating their work which ranges from gritty to beautiful and provactive to shocking. Includes insightful interviews with the photographers, unmasking the stories behind each photo and the human tales behind them. **www.rotovision.com**

Solomons

THE SPIRIT OF MOROVO

Text by Jeanne Liebetrau and photos by Peter Pinnock

adventure

Solomons

LEFT TO RIGHT: Swirling barracuda frame a lone diver; Red coral branches out in spectacular colour; Big eye jacks school over the reef; Batfish sports racey stripes that serve as camouflage to confuse predators

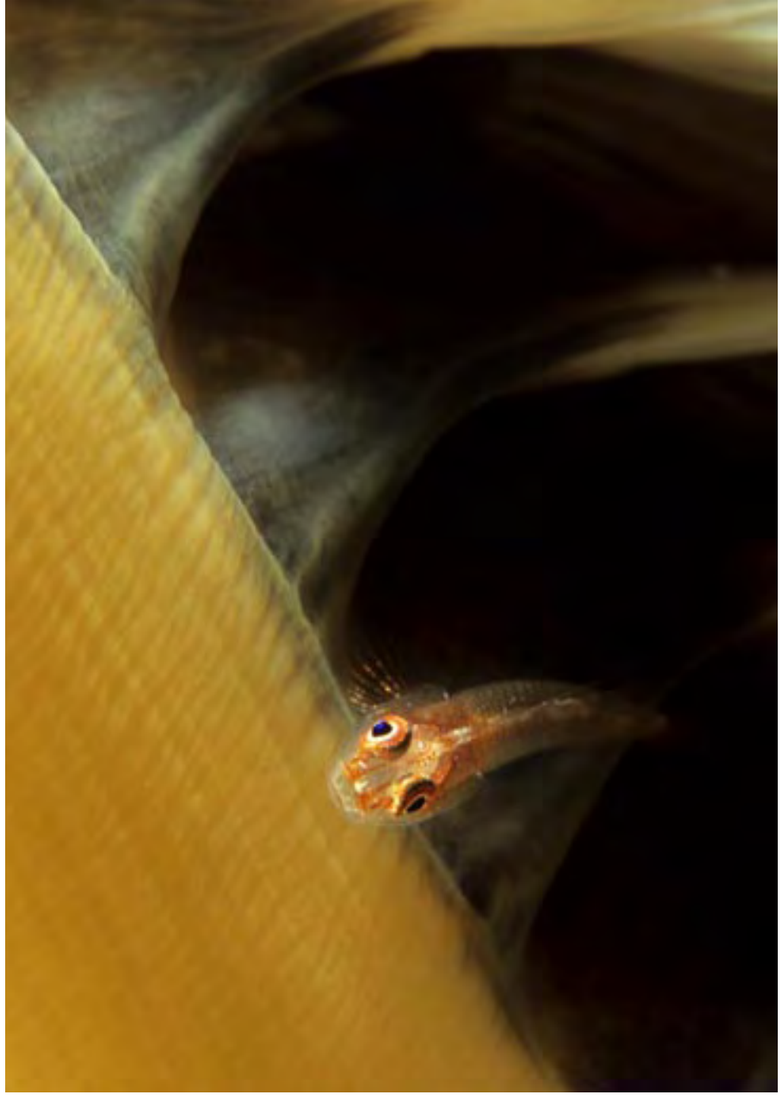
A dark cloud developed ahead of me. Curious, I swam nearer to investigate. The cloud billowed getting bigger and darker. Inside flashes of silver struck like a highveld thunderstorm. The cloud undulated with tumultuous movement. It was massive. As it twisted towards me I made out the characteristic shape of barracudas—the long sleek body, dark chevron markings and the mean looking straight jaw line. Thousands and thousands of barracuda were swimming together in tight synchronized formation.

The shape and direction of the shoal changed in perpetual motion as the front runners dropped back into the folds and others took over. Barracuda eyes stared through me as they moved around me, always keeping their distance. Suddenly, I was in the middle of a whirlpool of barracuda—totally surrounded by a wall of predators. As a few broke away and headed into deeper water the mass shifted spreading out endlessly into the distance. This phenomenal spectacle was unfolding before my eyes on Mary Island, Solomons.

Approximately 992 islands make up the Solomon Islands to form the third largest archipelago in the Pacific Ocean. Mary Island is only one such island situated midway between the larger Russell and New Georgia Island groups. When the Solomon islanders were still headhunters, tumoko (war canoes) stopped at Mary Island to prepare for battle. Today, both lay claim to ownership yet it remains unoccupied and inaccessible unless one boards the liveaboard *Bilikiki*.

The *Bilikiki* moors at Mary Island for an exhilarating day of unlimited diving. In the early morning, the barracuda are thick and close to the reef. As the day progresses, the main shoal moves further out to sea. Throughout the day small groups of a few hundred barracuda are sent to scout the reef briefly, before rejoining the main shoal. Meanwhile, huge congregations of big-eye jacks stream continuously over the reef.

Midday, the jacks are sparkling silver but as late afternoon approaches courtship begins bringing colour changes from silver to black. Jacks pair off performing intimate displays as they search for the ideal mate. Lurking



in amongst the shoal are Napoleon wrasses and trumpetfish while herbivores such as surgeonfish and fusiliers sweep behind the shoal feasting on the abundance of faeces. By late afternoon, the main shoal of barracuda return to perform a few final spectacular pirouettes before scattering into darkness to hunt. That night, while I was reliving this unbelievable experience, the *Bilikiki* steamed on to Marovo lagoon—a green dot on the western horizon.

Since 1987, Marovo lagoon has been proposed as a World Heritage site. Approximately 157kms long, it is perhaps the largest lagoon in the world. Marovo has two inactive volcanoes and over 300 islands, sand cays and mangrove islets. Only 20 of these are inhabited by 50 odd villages. Diving here exemplifies the diversity Solomons has to offer. Wall dives on the outside reefs can drop off to 2000m, channel dives on an incoming current yield rich pelagic sea life, whilst reef dives range from hard coral cities to soft coral

LEFT TO RIGHT: Sponge and feather star; close up reveals a goby with big eyes; masters of camouflage did not escape this photographer's lens

CLOCKWISE FROM ABOVE: Goby rests on hard coral; Longnose Hawkfish; Mug shot of cuttlefish

gardens.

Most dives in Morovo are done on the outside reefs in crystal clear warm water. The most striking feature of the walls is the huge gorgonian fans. The fans jut out perpendicular to the reef as they face into the predominant current. The fans' labyrinths support a living community. In a spectrum of colours, crinoids and featherstars dwell on the outer rims while damsels rest in the protection of the large fronds. Exquisitely beautiful longnose hawkfish take home ownership, seldom venturing far from the protection of their sanctuary. Yet, even smaller, semi-transparent gobies regard the main stems as raceway tracks as they too search for food.

Living inside the crinoids is yet another ecosystem. Crinoid clingfish may occupy the very heart of the crinoid. By assuming the exact colouration as their host, they have attained a perfect camouflage. Pairs of clingfish in grey, black, brown and even brilliant yellow are found. The crinoid's numerous arms often host Periclimenes shrimp couples. Again, cryptic colouring makes these critters difficult to see. I must have scrutinized a dozen crinoids before I found a decent sized elegant squat lobster hiding amongst the cirri (feet). Even though the female is much larger than the male, the squat lobsters only reach a maximum of 2cm. Imagine my surprise when I realized this crinoid hosted both clingfish and shrimps as well. This was certainly communal living.

Ending dives in the shallows of Marovo Lagoon is always rewarding. The hard corals are prolific with yellow damsels and purple goldies zooming in and out of the coral structures. Trumpet fish swim vertically amongst whip coral bushes trying not to be noticed. The sand patches in between the corals are a haven for shrimp and shrimp goby combos. The common goby found in Solomons is the Steinitz goby but the delightful Twinspot or Crab goby are sometimes seen in pairs. When the Twinspot erects the two dorsal fins, two perfectly deceiving eyes are exposed—enough to mislead any would be predator. These little gobies

use their pectoral fins like a hovercraft as they hover and hop across the sand to their holes.

Uepi Island

Uepi Island Resort is located on one of the barrier islands at the edge of Marovo Lagoon. It offers excellent diving for those not wishing to do five dives a day on a liveaboard. The resort has spacious bungalows boasting panoramic tropical island palm tree and white beach views in an amalgamation of rainforest and coconut plantation. The island is 2.5kms long with the vast lagoon on the one side and New Georgia Sound (the slot) on the other side. This was the route Japanese ships dashed under the cover of darkness to replenish their troops on the islands during the war. Resort operators Grant and Jill Kelly have dived the area for 22 years and still join guests on dives as they proudly show off their favourite reefs and critters. Jill speaks fondly of pygmy seahorses. She recently videoed a pregnant male for 20 consecutive days documenting the progress of his tummy. The pygmy seahorses of Morovo are different in colouring and even smaller than those seen elsewhere in the Pacific. This newly identified species (*Hippocampus denise*) is extremely challenging to find. Even more frustrating is finding one only to watch as it uncurls its tail and swims further away on the fan. Worse still, it ducks through the latticework and you are left looking at a fan with a bobble where the tail was. At Uepi, we were lucky to have Jill show us a fan with no less than 18 pygmies, one being a large (in pygmy terms) pregnant male at no bigger than 1cm.

LEFT & INSET: House reef provides hours of great snorkling and diving. ABOVE: A rare find, a pregnant Pygmy Seahorse. INSET: Underwater caverns make for interesting exploration

adventure

Solomons

CLOCKWISE FROM ABOVE: Sharks disperse a school of fish; Clownfish peeks out of anemone; Underwater caves provide opportunities to explore; Local children learn to paddle a wooden dugout early in life; Curious villagers and their children greet the crew of the *Bilikiki*

The main house of the resort overlooks Charapoana Passage, a channel linking the lagoon with the open ocean. The house reef stretches on one side of this passage from Welcome Jetty to Uepi Point. Blacktip and grey reef sharks are habituated at the jetty ensuring a guaranteed sighting, whether diving or snorkeling.

On an incoming tide, the opposite side of Charapoana Passage offers great diving. Starting on the outside wall, the soft corals bloom in the current; goldies flit in amongst the multitude of fans, whips and ferns; a plethora of colourful reef fish go about their daily business; schools of fusiliers swarm in the current while sharks patrol the entrance of the channel. As the current rounds the point and heads up the channel so too do the pelagics—trevally, dogtooth tuna, mackerel, rays and the sharks.

Babata Passage

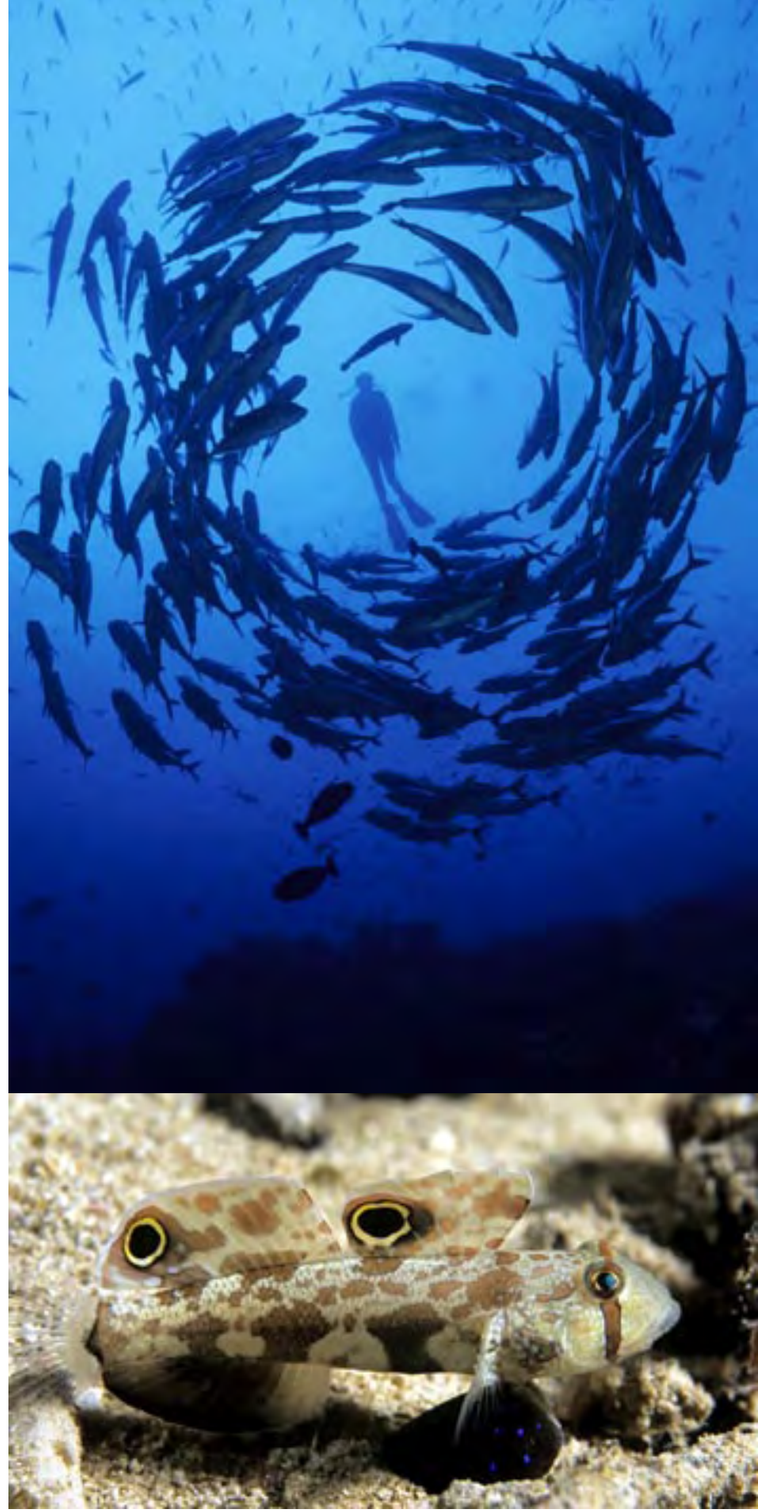
Babata Passage, on the other hand, is completely different. A scenic boat trip from Uepi resort passes perfect tropical islands, villages and coconut plantations. On route, one is conscious of being continually surrounded by islands. The boat negotiates a serene narrow canal to enter the shallow waters of a river lined with mangrove thickets. At the end of the river, the boat is tethered to an

Solomons

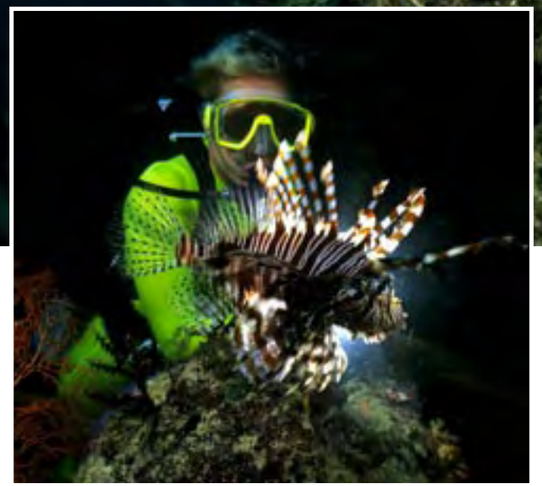
overhanging tree. Incongruously, the shallow river becomes a sinkhole 28m deep. From the sinkhole, divers enter a large cavern, which empties into a vast canyon before spilling into the ocean.

The return trip from Babata Passage passes Seghe airfield. About 50m from the edge of the runway is the wreck of a Lightning P38 plane that didn't make it home. Laying in only 9m of water, it is still in good condition with wings and twin tails intact. The P38 was armed with one 20mm cannon and four 0.50-in machine guns. The rounds of artillery shells packed into the nose of the plane are clearly visible.

The Solomon Islands has been in the news because of political tension. The tension, which was restricted to the capital, has been resolved and RAMSI officials (Regional Assistance Mission to the Solomon Islands) are helping rebuild the country. Villagers welcome guests to share their simple lifestyle. It's not uncommon for the entire village to be present for visits, the children having the most fun. From an early age, children learn to paddle a wooden dugout.



CLOCKWISE FROM FAR LEFT: Diver inspects the delicate architecture of a sea fan; schooling barracuda; a tornado of fish; clever camouflage of this twin-spot goby confuses predators; local children greet visitors



ABOVE: Remnants of a Japanese supply ship rests on the sea floor; The propellar of a Japanese warplane; Lionfish love wrecks

Whenever the *Bilikiki* lay at anchor, children from nearby islands would paddle out to greet the divers and trade fruit and vegetables with the crew.

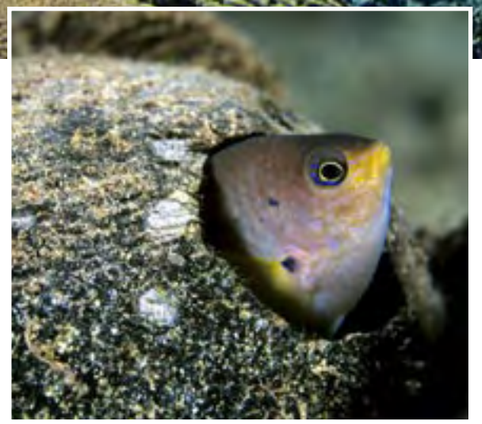
While most island life revolves around fishing and gardening, in Morovo its woodcarving that is the income generator. The rare Ebony, Queen Ebony, Kerosene, Rosewood and Coconut wood are hand carved and intricately inlaid with nautilus shell. The most popular carving is that of Nguzunguzu, a spirit figurehead traditionally positioned on the prow of the tomoko to ward off evil water spirits, guide the craft and protect the warriors. If the carved Nguzunguzo rests its chin on clenched fists then its represents war. It's quite a procedure to purchase carvings. Money is of no great importance as the nearest shop may be two days paddling away. Bartering for clothes, batteries, fishing and diving gear holds far greater value. The carver takes one aside to begin the negotiation. Everything is hush-hush. A first price is given. The buyer then spends the better part of an hour haggling and attempting to bring the price down.

War relics

During WW2, the Japanese occupied Marovo. The lagoon was the ideal place to hide ships among the hundreds of islands and a harbour was established at Wickham. The Japanese were soon detected by the Allied forces and at least three of their supply ships were torpedoed whilst at anchor. These wrecks rest upright in 30m of silty water. Lionfish love wrecks and these are no exception. Glassies, their prime source of food, nervously congregate around the black coral bushes. It is easy to penetrate the large holds where artillery shells, mortars, drums and cables are lying around. Two wrecks can be dived in one day but due to proximity not on the same dive.

Mangroves

When tired of diving walls, caves and wrecks there are still the mangroves to explore. Colonizing the shallows they host an assortment of unusual sea life. The archerfish is one such fascinating critter. The archer fish squirts a jet



CLOCKWISE FROM LEFT INSET: Damselfish shelters in a coconut; Super visibility in the lush house reef; Diver looks through lacy fronds of a fan coral. INSET: Squat Lobster

of water at flying insects like a missile and then feasts on the crash victims. A variety of crustaceans, clams, nudibranchs, tube worms and starfish all inhabit the nutrient rich waters. Anenomes find even the smallest rock on which to grow. Hiding under their folds are live porcelain crabs and shrimps, but it's the rich colours of the clownfish that grab ones attention. Solomon Islands have no less than seven different species of anemone fish.

The Solomon Islands are often referred to as 'islands lost in time'. Visiting Morovo Lagoon, one certainly understands why. But it is this untouched remoteness that adds appeal to divers. There is so much to see in Morovo Lagoon, so much unexplored and unspoilt. Yet, I will always remember the warmth of the Solomon Islanders as they shared their ocean realm with me.

Info

LOCATION: NE off Australia 5-12 degrees south of equator
DAY TIME TEMPERATURE: 28–32°C
WATER TEMPERATURE: 28-30°C
LANGUAGE: English and Pidgin English
VISAS: Onward ticket required and visa
CURRENCY: Solomon Dollar

Travel contact for Bilikiki Cruises and Uepi Island Resort: **www.bilikiki.com** or **www.uepi.com**

*Peter Pinnock has been photographing the ocean realm for over 20 years. His award-winning images have appeared in numerous magazines and glossy coffee table books. Peter lives in Durban, South Africa where he dreams of exotic locations, clear water and has easy access to the best diving in Southern Africa.For more underwater images and stories visit **PeterPinnock.com*** ■

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Northumbria Sub Aqua Club, UK
Dive training and trips
www.divenorthumbria.co.uk
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Based in the Pannine hills of Lancashire
www.saddleworth-subaqua.co.uk
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www.ase.tufts.edu/scuba
Underwater BC Photography Society
Vancouver, British Columbia, Canada
www.ubcps.bc.ca

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Speak of the Devil

Having an underwater nightmare? No, these are *real* people sporting some fancy hoods created by some zany Scots up in Orkney at Scapa Scuba. They started with a rabid shark hat for a joke, and well, it just took off. Now, they take custom orders for those divers who want to stand out from the crowd.

Wet & Weird

News edited by Gunild Symes

What's on *your* head? See **Scapascuba.com**

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Best Publishing Co, Flagstaff, AZ, USA
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Non-Profit Organisations

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Coral Reef Alliance —*Working together to keep coral reefs dive*
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The Manta Network
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Onderwaterfoto, Netherlands
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www.onderwaterfoto.net
One Ocean —*Earn frequent diver points toward equipment & travel*
www.oneocean.com
Patrick Musimu, Freediving Champion
Accept No Limits
www.patrickmusimu.com
Scuba Duba —*Online diving resource for news, equipment, buddies & travel*
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Scuba Spots —*The World's Oldest, Largest Scuba Directory*
www.scubaspots.com
Scuba.start4all.com —*Diving directory in cooperation with Diving World*
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ScubaDiveSites.com, Australia
Listing Dive Sites Worldwide
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UK Diving —*UK Scuba Diving Resource & Network*
www.ukdivers.com
Underwater Australasia —*Australia & Asia Pacific's most popular dive portal*
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UnderwaterTimes —*A daily journal of life in and around water*
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University of Michigan, OSEH
Dive links by Larry "Harris" Taylor, PhD
www-personal.umich.edu
WetPixel, USA
Digital imaging for divers
www.wetpixel.com
World-Newspapers.com
Scuba Diving Magazines Online
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Santa Barbara Ocean Film Festival
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Wet & Weird

News edited by Gunild Symes

PHOTO: K. PARKINSON © AUSTRALIAN MUSEUM

Great Scot! It's an ugly fish! This is a *real* fish folks... called a Fathead (genus *Psychrolutes*) which was trawled up in June 2003 during the NORFANZ expedition. It was found at a depth between 1013m and 1340m on the Norfolk Ridge, north-west of New Zealand (AMS I.42771-001). Its winning mug earned this fish the affectionate name, 'Mr Blobby', given by the scientists and crew aboard the *RV Tangaroa*. Notice the parasitic copepod on Mr Blobby's mouth... beauty enhancer or fashion statement?

Vodka from the Sea

Now just hold on there, wait a minute! Vodka made from deep ocean water? Yep, that's what it is. Handcrafted on Maui, OCEAN Vodka is made in small batches by a family business in Kahului, Hawaii, USA.

The producers combine MaHaLo Hawaii Deep Sea™ Water and the finest organic spirits to make this extra smooth beverage. The supplier of the deep ocean water, Koyo USA, first accesses the water from 3,000 feet below the surface of the Pacific Ocean and then desalinates, purifies and balances it with a state-of-the-art system. They say that the deep sea water is "very cold and exceptionally pure".

In addition, 100% USDA certified organic spirits of corn and rye used to make the vodka are grown in the U.S. without the use of pesticides, herbicides or genetic modification. Through accurately controlled heating and cooling of the liquids, the distillation process separates any impurities from the pure grain spirits. OCEAN Vodka is free from blending and flavor additives, has 40% alcohol by volume (80 Proof) and is bottled in both 750ml and 50ml sizes. A portion of the proceeds from the sale of OCEAN Vodka is donated to ocean conservation organizations. For more information, please visit: **www.oceanvodka.com** ■

David Pilosof

Diving into the Disabled Diver's World

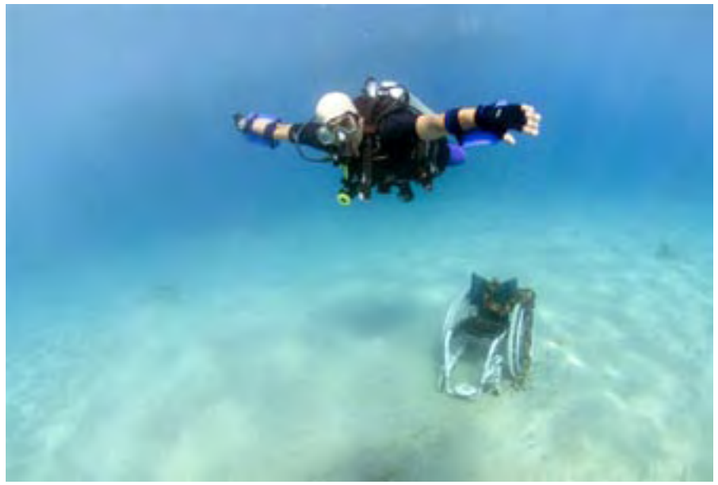
Text by Gunild Pak Symes
Photos by David Pilosof

Flying with the dolphins in the clear blue sea—what freedom really means... The ocean is a great leveller, where bouyancy is law, not the number of working limbs we have nor the height at which we stand nor the speed at which we walk... where weightlessness in the blue lessens, indeed, nullifies the heaviness of land-based limitations... where human beings and undersea creatures meet with the same curiousity born inside all living things

David Pilosof

Disability, while synonymous with serious limitations on land, is not necessarily so in the water. More and more individuals with disabilities are finding the joy and freedom of movement in SCUBA diving as special courses and instructors trained to guide people with disabilities through certification increases globally. These pages show what words cannot... Shot by world renown underwater photographer, David Pilosof, these images capture the elation, liberation and connection with nature, which divers with disabilities can experience in the underwater realm.

If you would like more information on dive courses for the disabled and dive operators who serve disabled divers or training to become an instructor for people with disabilities, please visit the International Association of Handicapped Divers at **www.iahd.org**



David Pilosof

dive industry including his role as producer of YAM, the Israeli diving magazine and the diving portal *idive*. This past year, Pilosof organised Sandisk Red Sea 2006, the high profile international underwater photography competition held April 24-29 in Eilat, Israel, sponsored by YAM and the Sandisk Corporation, the world's largest Flash memory card manufacturer. For more information, email: **info@sandiskredsea.com** ■

Underwater photographer, David Pilosof, first found fame with the production of his now world renowned album of underwater photographer, *Samantha*, shot with then newcomer model, Samantha Bond, in 1977. Since then, Pilosof has managed to keep afloat a lively career in the

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