

*Gifts for Shark Lovers Only*



GLOBAL EDITION  
November 2009  
Number 32

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**Axis Mundi**

Profile  
**Clement Lee**

Tech Talk  
**Dry Suits**

The Oceans  
**Plastic  
Soup**

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M A L A Y S I A

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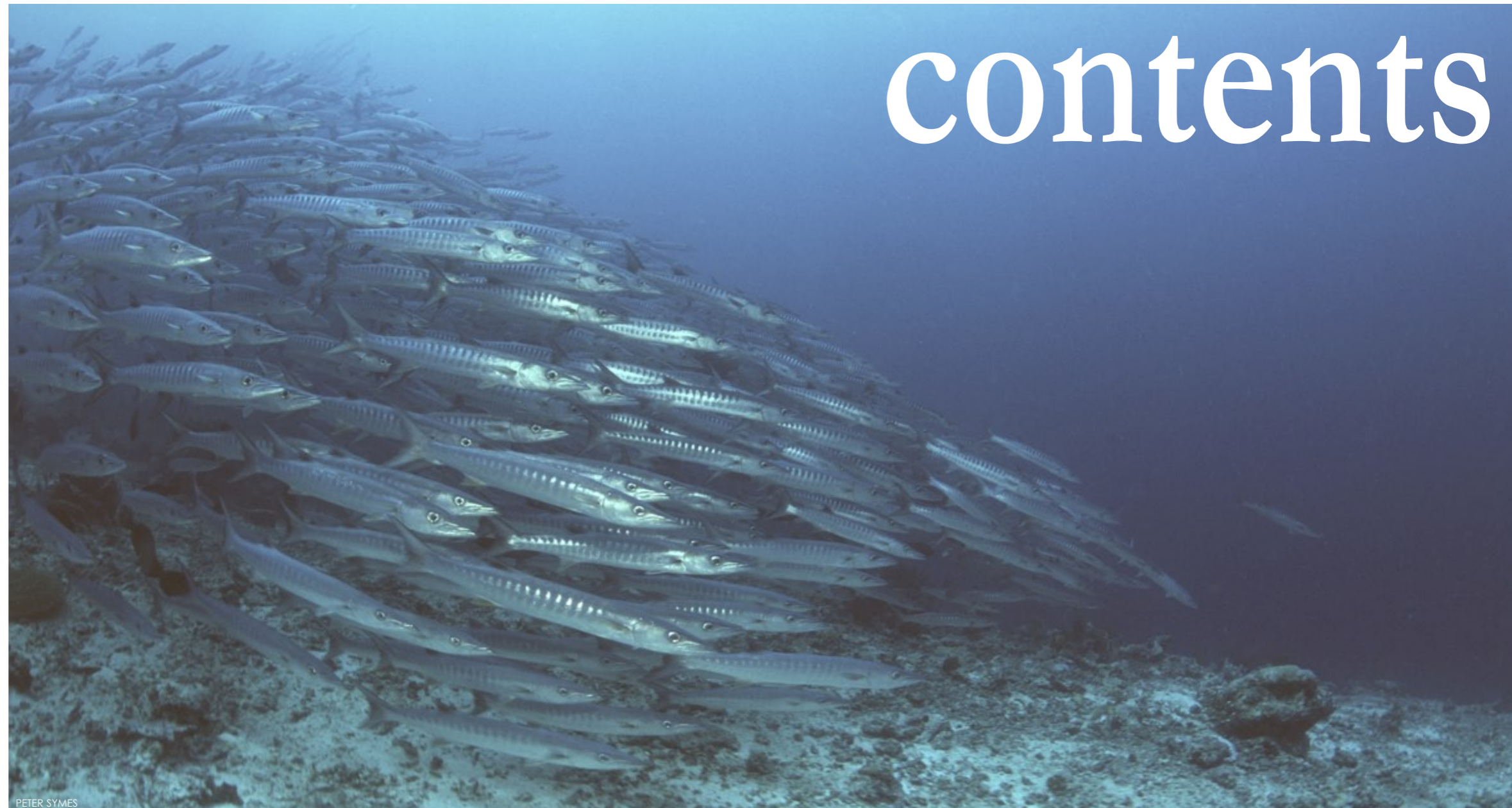
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COVER PHOTO: *Pair of Zebra Crabs on Fire Urchin, Lankayan, Malaysia*, by Andrea and Antonella Ferrari  
THIS PAGE: *'Barracuda Rushhour' Sipadan Island, Malaysia*, by Peter Symes  
(CONTINUED ON PAGE 4)

# contents



**22**  
SABAH REEF & RAINFOREST  
CONSERVATION SUCCESS  
BY A & A FERRARI

**51**  
KIDS SCUBA  
MALAYSIA  
EDITED BY GUNILD SYMES

## columns...

**79**  
GIFTS FOR SHARK  
LOVERS ONLY  
EDITED BY GUNILD SYMES

**29**  
SEPILOK: IN THE FOREST  
REALM OF THE ORANGUTAN  
BY A & A FERRARI

**56**  
EQUIPMENT FEATURE:  
ALL ABOUT DRYSUITS  
BY PETER SYMES  
& ROZ LUNN

**84**  
PROFILE:  
CLEMENT LEE  
BY PETER SYMES

**31**  
KINABATANGAN: A TRIP TO  
BORNEO'S HIDDEN JEWEL  
BY A & A FERRARI

**67**  
MANUFACTURER:  
URSUK OF FINLAND  
BY ANDREY BIZYUKIN, PhD

**89**  
THE OCEANS:  
PLASTIC SOUP  
EDITED BY BONNIE MCKENNA

**34**  
DANUM: THE VALLEY  
WHERE TIME STANDS STILL  
BY A & A FERRARI

**69**  
YUKATÁN CAVE DIVING:  
THE ROLEX EXPEDITION  
BY PAUL JEFFREY  
PHOTOS BY KURT AMSLER

**91**  
UW PHOTOGRAPHY:  
MACRO SEA DRAGON  
BY TONY WHITE

**38**  
SABAH REVISITED  
MALAYSIA  
BY PETER SYMES

**76**  
FILMING AXIS MUNDI  
YUKATÁN CAVE DIVING  
BY NATHALIE LASSELIN

**95**  
PORTFOLIO:  
JUDE COWELL  
EDITED BY GUNILD SYMES

<b>plus...</b>	
EDITORIAL	3
NEWS	5
WRECK RAP	12
EQUIPMENT	19
BOOKS & MEDIA	55
TURTLE TALES	81
SHARK TALES	83
WHALE TALES	88

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# The times... they are a-changing

*“The strength and beauty of sharks are a natural barometer for the health of our oceans. Therefore, I declare today that Palau will become the world’s first national shark sanctuary, ending all commercial shark fishing in our waters and giving a sanctuary for sharks to live and reproduce unmolested in our 237,000 square miles of ocean. We call upon all nations to join us.”*

Johnson Toribiong, President of Palau,  
in a speech to the United Nations General Assembly  
on Friday, September 25, 2009

Bravo! This was a landmark speech by a head of state and remarkable news in several ways.

The value of such a sanctuary cannot be overrated. Findings from other no-take zones have clearly demonstrated how significant sanctuaries are for rebuilding dwindling fish stocks. From within these zones, fish populations have often rebounded and replenished stocks elsewhere.

What a long way we have come in a few decades in our appreciation of sharks. Not so many years ago, these magnificent creatures were seen as voracious man-eaters only to be feared and loathed... *The only good shark was a*

*dead shark*—was how the saying went.

Some 30 years after Steven Spielberg's *Jaws* movie first scared the living daylights out of the movie-goers and made us anxious about taking a swim at the beach, we find that dive travellers are paying top dollar for close encounters with sharks, and most recently, in some cases, even swimming in open water (without cages) with tiger sharks and great whites.

Our appreciation of sharks, and the value we place on sharks, has come a long way. Let us hope that the trend continues to spread worldwide. Sharks are worth so much more alive than dead, in terms of both ecology and economy. ■

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# DE L'IMAGE SOUS-MARINE



Renata LUKMANOVA, 13 ans, Russie



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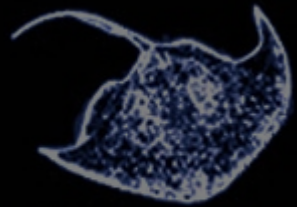
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X-ray mag

News edited  
by Peter Symes  
& Catherine G S Lim

# piping hot NEWS



Italian researchers have found one of the largest forests of black coral off the coast of southern Italy.

Comprising almost 30,000 colonies, the black corals (*Antipathes subpinnata*) covered ground as large as two soccer fields. As it was at a depth of 50 to 100 metres, researchers used a remote-controlled submarine to film the massive forest.

In addition, they also discovered an extremely rare black coral species, *Antipathes dicotoma*. It is so rare that there are only five fragments of it being stored in museums. This was the first time this coral species had been found alive in its natural

habitat. However, as excited as they must be, the researchers are keeping mum about the site of their discoveries. "The coral we found has a great value, primarily because of its rarity," said Silvestro Greco, head of the environmental agency for the southern Italian region of Calabria.

"If somebody with no conscience knew exactly where they were, I think there would be risks. That's why we have not really disclosed where they are."

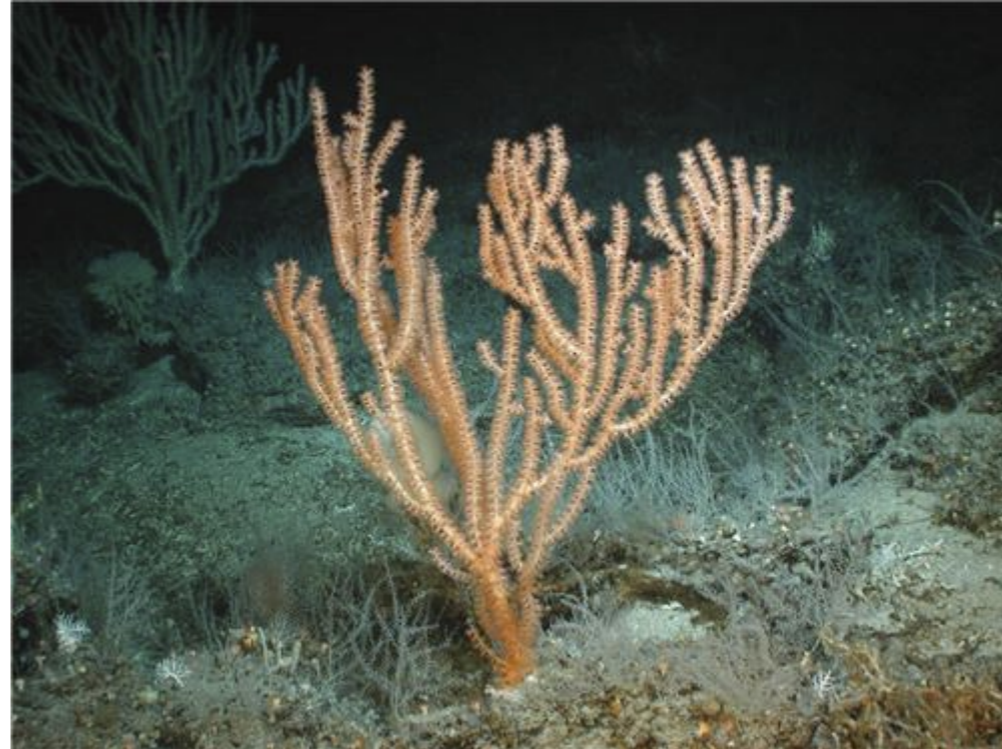
Black coral is listed as an endangered species by the Convention on International Trade in Endangered Species. It is brightly coloured, and gets its name from its black or brown skeleton. It is this skeleton that is sought after for use as jewellery.

Simone Canese, chief researcher of the

exploration project, credited the progress in underwater technology for the breakthroughs in the filming and study of new marine environments.

"With the recent increase in underwa-

ter exploration, more of them [*Antipathes dicotoma*] may be discovered, but we have provided the first images of them, alive, in their environment." ■



Deep water coral

## Massive Black Coral Forest Found Off Southern Italy

## Deep-water Corals Receive State Protection

Over 23,000 square miles of deep-water coral reefs in the South Atlantic is now under state protection, thanks to a historic ruling by the South Atlantic Fishery Management Council.

The legislation will protect coral species living in waters off the coasts of the Carolinas, Georgia and eastern Florida, at depths of 400 to 700 metres.

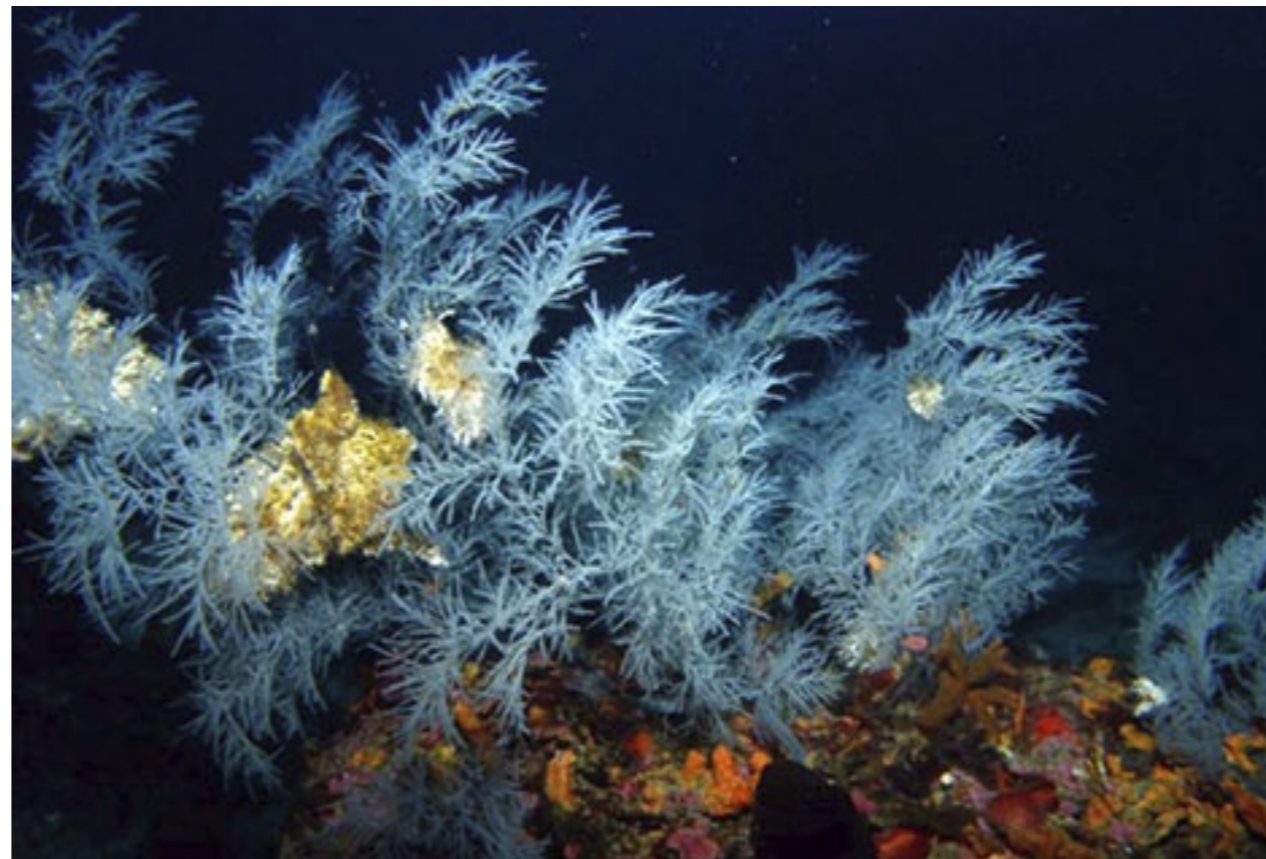
This is a significant move, as the South Atlantic region is home to what is believed to be the world's largest contiguous distribution of deep-water corals. Now, with the legislation, the corals would be safe from the impact of bottom-tending fishing practices.

However, the concerns of the fishermen who work in the region have not gone unheard.

Working closely with fishermen, fisheries managers and coral reef experts, Dan Rader, chairman of the Council's Habitat and Environmental Protection Advisory Panel, outlined specific areas in which fishing would be allowed with gear restrictions.

These "Allowable Golden Crab Fishing Areas" and "Shrimp Fishery Access Areas" help to ensure the continued existence of these fisheries and the communities they support.

According to Rader, "I know of no other example where the finest science available was translated through interactive work with managers and fishermen into world-class protection. This impressive 'win-win' should be celebrated by all those who love the sea, and who appreciate eating sea food they know is harvested in ways that protect its bounty." ■



ABOVE LEFT: Close-up view of rare black coral. RIGHT: Garden of rare black coral at growing in the wild

# A Holistic Approach to Coral Reef Health

Maintaining the good health of coral reefs is best done in a holistic manner, taking not just the physical health into consideration, but the environmental factors as well.

A case in point: Following a major bleaching incident, corals on various reefs in Honduras and Belize recovered and grew normally within two to three years when the surrounding waters were healthy. However, at locations where there was excessive adverse impact (like pollution), the corals did not recover fully, even after eight years.

"You can imagine that when you are recovering from a sickness, it will take a lot longer if you don't eat well or get enough rest," said Jessica Carilli, a graduate student at Scripps Institution of Oceanography at UC San Diego.

"Similarly, a coral organism that must be constantly trying to clean itself from excess sediment particles will have a more difficult time recovering after a stressful condition like bleaching."

Disease and overfishing also affected coral health. In places where there is overfishing, the population of bigger fishes like groupers are either significantly reduced or

have vanished.

In the absence of these predatory fishes, other fish species thrive. One such species is the butterflyfish, which feed on coral and appear to be responsible for disease transmission amongst the corals.

In a study, scientists compared seven Marine Protected Areas [MPAs] where fishing had been banned for at least five years, and another seven neighbouring sites with similar diversity.

They discovered that the corals at the latter sites suffered more diseases; in some cases, the difference was twice as many. In addition, many butterflyfish were found at the sites where fishing was allowed, leading to a higher incidence of coral disease.

Similar patterns were found at the Great Barrier Reef in Australia.

Of course, other factors do come into the picture. Pollutants like sew-

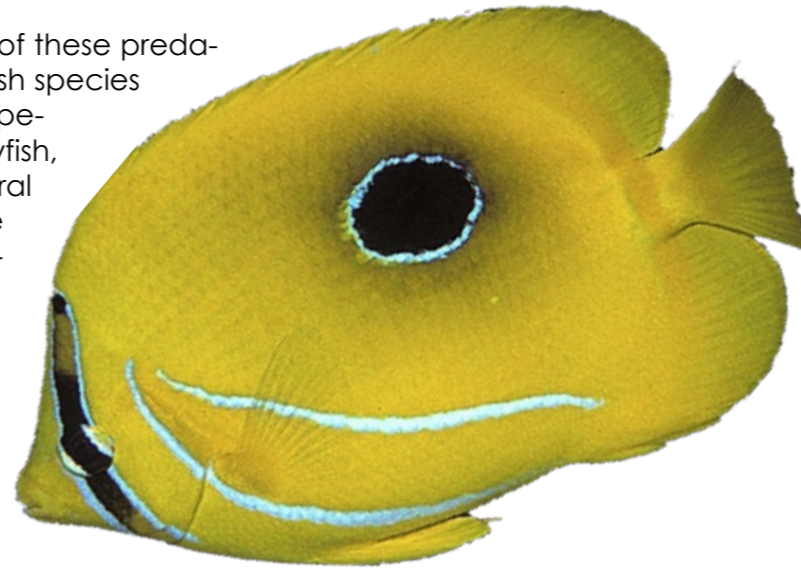
erage and fertiliser are bad news for corals, as are the abnormally high water temperatures during the occurrence of El Nino.

Nevertheless, preserving the diversity of the reef appears to boost their ability to cope with certain rising temperatures.

"The general trend is that where you find more functional diversity, you find fewer butterflyfish," reiterated Laurie Raymundo, a researcher at the University of Guam.

Of course, to ensure that predatory fishes are present to keep down the number of butterflyfish, the scientists are not advocating that fishing be banned. Rather, it is about maintaining a balance.

"One of the things that came out of this is that if you have a well-managed MPA, it works to keep coral healthier. [...] So as long you keep certain species there and can control fishing—don't catch in certain seasons or don't catch fish under a certain size, whatever is appropriate—you might not have to ban it completely." ■



Blue-lashed butterflyfish, *Chaetodon bennetti*

BERNARD E. PICTON

## Hawaii: Scientists Diving to New Depths Make Exciting Discoveries

Diving as deep as 250 feet, scientists on a research trip at the remote Northwestern Hawaiian Islands made some exciting discoveries.

At the Papahānaumokuākea Marine National Monument, they discovered new coral species, as well as deep-water algae beds that served as nursery grounds for juvenile reef fish like the parrotfish and butterflyfish. In fact, they even got hold of the first specimen of a recently discovered species of butterflyfish.

"We were seeing reefs that no human has ever laid eyes on before," said Randall Kosaki, the research mission's chief scientist and diver.

"The coral reef habitat goes four times deeper than where we've been working prior to this."

During the month-long expedition, Kosaki and his team had been diving with the help of new technology that allowed them to dive deeper than was possible several years ago. As a result, at the 200-foot depth, they found 12 to 15 fish species never seen before at the monument.

The fish population there were thriving, thanks to the fact that fishing did not take place in the protected zone. The relative isolation of the monument (with the only human settlement at a research outpost on Midway Atoll) meant that the reefs were not subject to runoff from housing developments and paved riverbeds. Hence, the reefs at the monument were very healthy.

"At one time, we had 100 sharks around us. It's just something you don't see here on Oahu or any of the inhabited islands," Kosaki said. ■



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Staghorn coral (*Acropora cervicornis*) has been listed as threatened because their numbers are declining, owing to a combination of natural and anthropogenic stress factors

## Reproduction of Farm-raised Corals Spell Hope for Coral Restoration

For the first time, Atlantic-Caribbean farm-raised staghorn corals were documented to have reproduced, giving hope for the future of coral restoration.

This discovery was significant in that it proved that transplanted staghorn corals still possessed the ability to survive in the wild, reach sexual maturity, and reproduce.

Working with the marine scientists of the Florida Keys National Marine Sanctuary, students dove and collected gametes released from transplanted corals at Molasses Reef off Key Largo in August.

"This is very much like a great big circle of life," said Dr David Palandro, a research scientist for the Florida Fish and Wildlife Conservation Commission. "Corals were transplanted here, and we're collecting the gametes from those transplanted corals, and we hope to take those gametes and transplant them some-

place else."

Added Ken Nedimyer, president of the Coral Restoration Foundation: "This is real exciting because this is the future of trying to rebuild these reefs." In addition to being involved in coral restoration projects for the past nine years, Nedimyer has been personally involved in the corals at Molasses Reef in recent years.

In 2006, he had harvested inch-long fragments of live staghorn and planted them in a special nursery off the Upper Keys. The following year, with the help of students, the more mature clippings were transplanted into a portion of sand at Molasses Reef.

Then, in August 2009, other students working as part of SCUBA nauts International education group documented and collected gametes from these farmed corals.

The results give hope for the future of the corals. "We're grow-

ing a lot of corals in our nursery, and we can replant them on some reefs, but we could never replant all corals on all the reefs," said Nedimyer.

"The goal is to get them reproducing successfully, so they can do what they used to do."

In the northern hemisphere, spawning normally takes place a few days after the full moon in August or September. During this time, larvae are dispersed over a wide area. If they survive long enough, ocean currents might relocate them 10 to 50 miles from the original site, according to Nedimyer.

For the students, the experience gave them to a new realm of knowledge. "All we see on land is how animals reproduce, but we don't really know what goes on underwater. It was awesome," said Nick Johnson, a high school senior from Dunedin, Florida. ■

## Diverse fish reduce diseases in coral

Coral reefs with a diverse fish population are healthier than overfished ones.

Scientists showed a reduced incidence of coral disease in areas of the Philippines where fishing is banned, compared with neighbouring areas. The researchers concluded that some types of fish probably carry coral diseases, writing and suggesting that the disease-carrying species thrive where predatory fish are absent.

Butterflyfish (*Chaetodontidae*), which are not fished, appear the likely culprits in disease transmission. "People like to eat the big predators such as groupers and a few others," said lead researcher Laurie Raymundo. "In some cases, these species are not so abundant, and in others, they've just gone. And the general trend is that where you find more functional diversity, you find fewer butterflyfish," the University of Guam researcher told BBC News.

Diseases have inflicted substantial damage on coral reefs in a number of regions in recent years, notably the Caribbean, where naturally abundant species, such as elkhorn and staghorn, have been almost wiped out in some places. ■



Copperband butterflyfish, *Chelmon rostratus*

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# Stop Shark Finning — One Soup Bowl at a Time

Text and photos by Catherine G S Lim

Smashing soup bowls to protest against shark finning was what shoppers and passers-by did at a special event to celebrate World Animal Day in Singapore recently.

Organised by **ACRES** (Animal Concerns Research and Education Society), the three-day event encouraged passers-by at a busy shopping district to throw donated shark's fin soup bowls in an enclosed space. The broken pieces were then used on the spot to create installation art - a 15-metre mosaic of a shark.

"This tradition [shark finning] is not only cruel, it is wasteful and hugely destructive, because when sharks die, the entire marine ecosystem also collapses," said Louis Ng, Founder and Executive Director of ACRES.

Every year, about 100 million sharks perish to satisfy the global demand for shark's fin soup. Singapore, where the event was held, is the world's third largest shark's fin trading centre, according to the UN's Food and Agriculture Organization.

The opening ceremony on October 2nd was graced by local celebrities who learnt more about the issue and pledged to go off shark's fin soup. Then, they had a ball of a time smashing soup bowls and laying the first pieces of the

shark mosaic.

ESPN Star Sports presenter Jamie Yeo, who threw the 'inaugural' soup bowl, said, "Some things are created perfect but humans and their traditions are fallible. Therefore, sometimes we need to break the tradition."

After all the celebrities had a go, they penned personal messages on one of the walls that formed the enclosure, and then were treated to a free sampling of doubled-boiled ginseng soup with pumpkin silky beancurd and bamboo fungus, a vegan alternative to shark's fin soup, courtesy of Fairmont Hotels & Resorts. So far, this is the only hotel in Singapore that has made a deliberate choice to stop serving shark's fin soup.

Over the three days, the response was very positive, with the public willingly forking out \$2 for every soup bowl. Some even bought several bowls at a time. Donations were also sought, to further the anti-shark-financing campaign, and to fund ACRES' other educational and outreach programmes, as well as wildlife rescue. In total, more than \$8,000 were raised.

Several hundreds of soup bowls, complete with spoons, were donated to ACRES for this event. Intended to be discarded anyway, the soup bowls now have a second

life, as a meaningful and somewhat ironic second life. After the exhibition, the broken pieces would be used to create permanent works of art for exhibitions and ACRES' education programmes. ■

*"Shark's fin coup is so passe."*

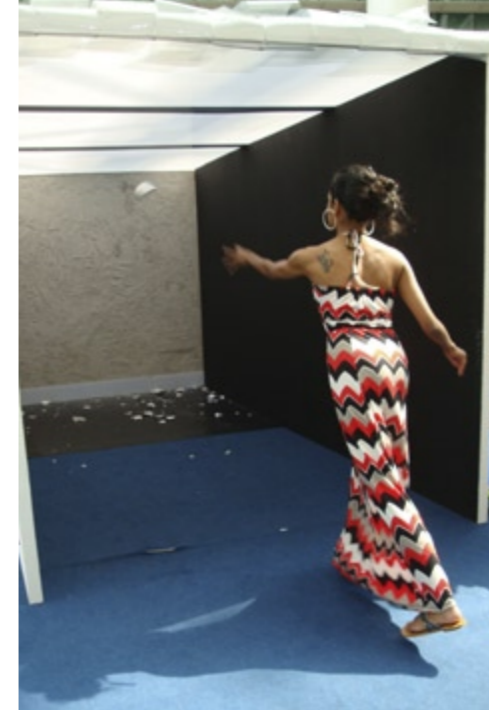
—Melody Chen,  
television presenter & actress

*"Traditions aside, how could one stomach shark's fin soup when there is so much cruelty afflicted in producing such a dish? You don't have to condone such practice to gain status."*

—Randall Tan,  
television actor

*"One of my friends told me what happens to the sharks, and after that, I couldn't eat it anymore."*

— Passer-by



CLOCKWISE FROM TOP LEFT: Detail from poster for event; Actress throwing soup bowl; Supporter gets shark tattoo; Vegan alternative to shark fin soup; Actor fills in the shape of a shark with broken pieces of soup bowls; ACRES founder, Louis Ng, talks to a reporter about the event and the cause; Shape of shark filled with broken pieces of soup bowls; Families show their support by signing a wall





Dressed in full scuba gear, the government of the Maldives held a cabinet meeting underwater to highlight the threat of global warming to the low-lying Indian Ocean nation. In 2007, the UN Intergovernmental Panel on Climate Change predicted that sea level rise will submerge the low-lying islands of the Maldives within a century.

## Maldives' government conducts cabinet meeting under water

President Mohamed Nasheed, conducted the 30-minute meeting at a depth of 20 feet off the coast just north of the capital, Male.

Sitting five feet deep in the lagoon, President Mohamed Nasheed and 11 cabinet ministers used hand signals and a white slate to communicate before signing a declaration calling on all nations to "join hands and reduce carbon emissions and bring down the level of carbon in the atmosphere to below 350 ppm". Current levels of carbon in the atmosphere stand at 390 ppm.

Climate change was a serious issue that needed the world's attention, the president said.

The president appealed for a concerted effort to commit to "a better deal" at the landmark Copenhagen climate change

summit in December to ensure that "everyone survives". World leaders will congregate in

Copenhagen in an attempt to forge a successor to the Kyoto Protocol, due to expire in 2012. ■

### Natalia Molchanova set freediving record at age 47

Russian freediver, Natalia Molchanova, has become the first woman in the world to break the 100 meter barrier in Constant Weight, by freediving to 101 meters off Sharm el Sheik, Egypt. Her total dive time was 3 minutes and 50 seconds. ■



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# 'Turtle Mafia' on Bali is at it again



By Kurt Amsler

Sea turtles on Bali are once more in danger of being butchered. You can help prevent it. Once again, we ask for your support. We have managed to put a stop to this slaughter before. But now the 'Turtle Mafia' on Bali is at it again. The governor of Bali is being pressured to permit the slaughter of thousands of sea turtles for 'religious purposes'.

About a year ago, we could proudly announce that the campaign to stop the slaughter of sea turtles on Bali had been a success. The cages and slaughterhouses in Tanjung Benoa were all empty and no more turtles were being traded in public places.

While it was still possible to find some animals on the black market, they were harder to find. The number of killed and traded animals dropped around 90 percent since the onset of the campaign.

There were reasons to be proud. After an eight-year battle against the Turtle Mafia, we seemed to have won the war.

## The ghost reappears

Yet, the issue is now raising its ugly head again.

Thanks to an intensive lobby by various interest groups, the Balinese Government is now considering permitting the killing and trading of a thousand sea turtles per year for Balinese rituals.

Obviously, such a decision will open the floodgates to uncontrolled killing once again, and it will be impossible to control the number of animals slaughtered.

We need to react now! It is not too late. The opposition and the Pro Fauna organisation is engaged in ongoing discussions on various political levels. But they need our immediate support.

SOS-Seaturtles is already financially supporting the entire administration as well as initiating a petition during which thousands of letters of protest will be sent to the authorities. We are very concerned for Bali's sea turtles and don't consider such a decision just a domestic issue.

Watch **this video** from Bali. This movie was filmed a decade ago. Do you want this to happen again? If not please sign our petition on the following **link**.

*Thank you for your support! ■*



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A bed of the macroalgae bladderwrack (*Fucus vesiculosus*) is home to diverse sealife including this rock-pool shrimp (*Palaemon elegans*)

# Seaweeds are *not* plants

Although they have many plant-like features seaweeds are not true plants but algae

While there are some plants that grow in the ocean, the majority of the big ocean photosynthesizers are the seaweeds. Although they have many plant-like features seaweeds are not true vascular plants; they are algae. Algae are neither plants nor animals but part of the Kingdom Protista, the kingdom that contains all those single-celled organisms that we glimpsed under microscopes in pond water samples back in elementary school.

**No veins and no flowers**  
 Seaweeds are not grouped with the true plants because they lack a specialized vascular system (an internal conducting system for fluids and nutrients), roots, stems,

leaves, and enclosed reproductive structures like flowers and cones.  
 Because seaweeds live in the ocean, surrounded by water, they don't need and have none of the structures that plants use to obtain water and nutrients from the soil. Seaweeds lack the vascular system and roots of a plant; they can absorb the water and nutrients they need directly from the ocean surrounding them.

The leaves of seaweeds are called blades. Technically, they are not really leaves since they lack veins.  
 Like true plants, seaweeds are photosynthetic and convert energy from sunlight into the materi-

als needed for growth. Within their cells, seaweeds have the green pigment chlorophyll, which absorbs the sunlight they need for photosynthesis and gives many seaweeds their green colouration. In addition to chlorophyll, some seaweeds contain other light absorbing pigments. These pigments can be red, blue, brown, or golden, and are responsible for the beautiful colouration of red and brown algae.

Many seaweeds have hollow, gas-filled structures called floats or *pneumatocysts*. These help to keep the photosynthetic structures of the seaweed buoyant, so they are able to absorb energy from the sun. ■

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## Lost Fighter Jet Found in California Bay

Pat Macha, an aircraft archeologist who has identified about 3,700 crash sites and visited more than 800 around the Santa Monica Bay seafloor, was part of a search team that have accidentally found and identified the wreck of a Lockheed T-33A jet fighter that disappeared nearly 54 years ago.

Computer expert Gary Fabian is the founder of UB88.org, a group that discovered a missing World War I German U-boat off the California coast in 2003. He was the one who identified "a few little pixels" on a high-definition U.S. Geological Survey image map of the Santa Monica Bay ocean floor.

Fabian met Macha about five years ago in Huntington Beach, California, while researching for military aircraft wrecks.

Macha told him about his 11 year search for another missing aircraft, a P-51D Mustang fighter flown by World War II Women's Air Force Service pilot Gertrude "Tommy" Tompkins Silver, presumed lost at sea in 1944. Silver's is the only wreckage that has not been found.

### Dive operation

Fabian sent the map info to Ray Arntz, owner and operator of a southern California dive company and a fellow member of UB88.org.

Arntz and fellow employees set out to search and found three wrecks using side-scan sonar. Two turned out to be boats. They weren't sure about the third, so they went down to inspect the site.

He saw a fairly compact debris field

with a lot of aluminum, which indicated that it was an airplane. They also found landing gears, which corroborated it.

Ray's crew identified a manufacturer's number on a feed mechanism for a 50-caliber machine gun. The engine appeared to be a jet, so he knew it wasn't the Mustang, which had a propeller motor.

At that point, Arntz realized that, "We know it's not what we're looking for."

Researching government documents, the searchers found that the manufacturer's number indicated it was a T-33 Shooting Star, which had disappeared in the area.

"It just matched what we had," Arntz said. "The T-33 was it."

### Lost and not found

While looking for one missing plane, Macha and the others came upon an unexpected wreckage.

"It's a funky thing," said Macha. "You're looking for one aircraft, and you find another."

Macha's interest in aircraft wrecks started in the 1960s when he found a crash site while working in a Boy Scout camp in the San Bernardino Mountains.

There are 2,500 crash sites around California, he said, where airplanes and their scattered remains can still be found. Some are listed on his website: [www.aircraftwrecks.com](http://www.aircraftwrecks.com) ■

## NOAA locates US Navy Ship Sunk in World War II Battle

A NOAA-led research mission has located and identified the final resting place of the *YP-389*, a U.S. Navy patrol boat sunk approximately 20 miles off the coast of Cape Hatteras, NC, by a German submarine during World War II.

Built originally as a fishing trawler, the *YP-389* was converted into a coastal patrol craft and pressed into service after the Japanese attack on Pearl Harbor. The ship was equipped with one 3-inch deck gun to protect the ship from enemy aircraft and surfaced submarines and two .30-caliber machine guns. However, when the ship was attacked on 19 June 1942 by the German submarine *U-701*, the ship's deck gun was inoperative, and the *YP-389* could return fire only with its machine guns and six sailors died in the attack. There were 18 survivors. Weeks after the attack on the *YP-389*, the *U-701* was sunk by Army aircraft in the same vicinity as the *YP-389*.

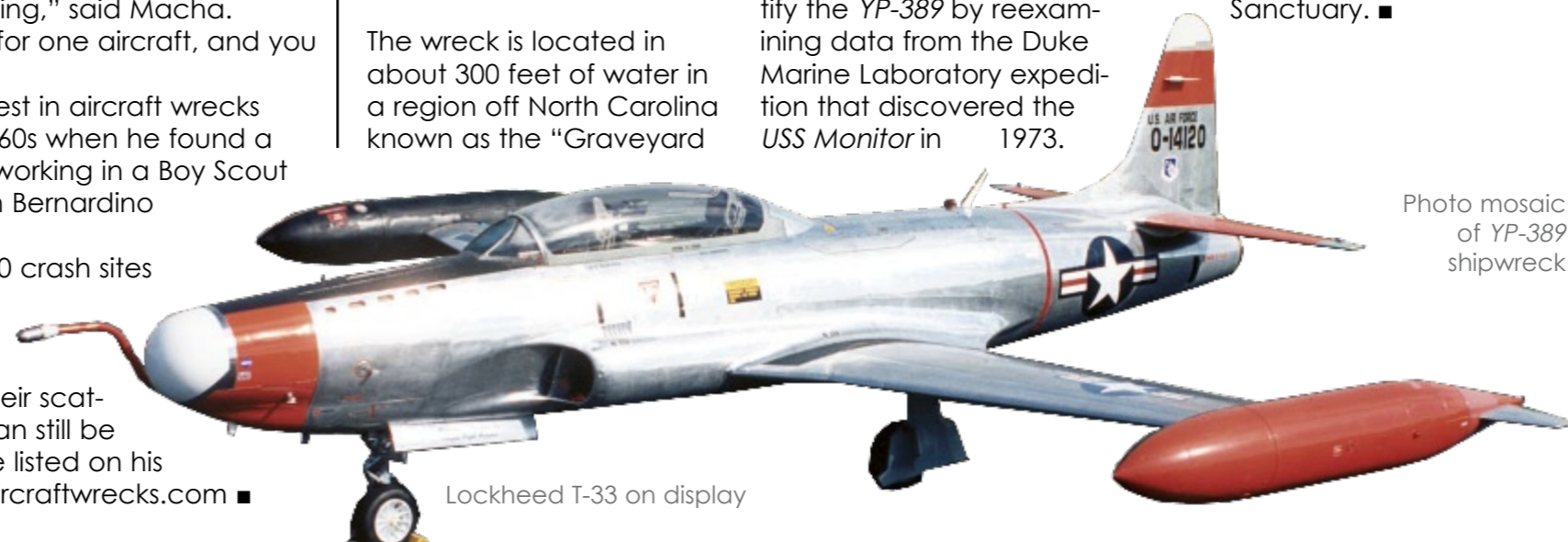
The wreck is located in about 300 feet of water in a region off North Carolina known as the "Graveyard

of the Atlantic," home to U.S. and British naval vessels, merchant ships, and German U-boats sunk during the Battle of the Atlantic. Today, the relatively intact remains of the *YP-389* rest upright on the ship's keel. The wreck site is home to a variety of marine life. Much of the outer-hull plating has fallen away, leaving only the intact frames exposed.

NOAA and its expedition partners mapped and shot video of the wreck using high-resolution camera equipment, multibeam sonar and an advanced remotely operated vehicle deployed from the NOAA ship *Nancy Foster*. Researchers were able to locate and positively identify the *YP-389* by reexamining data from the Duke Marine Laboratory expedition that discovered the *USS Monitor* in 1973.

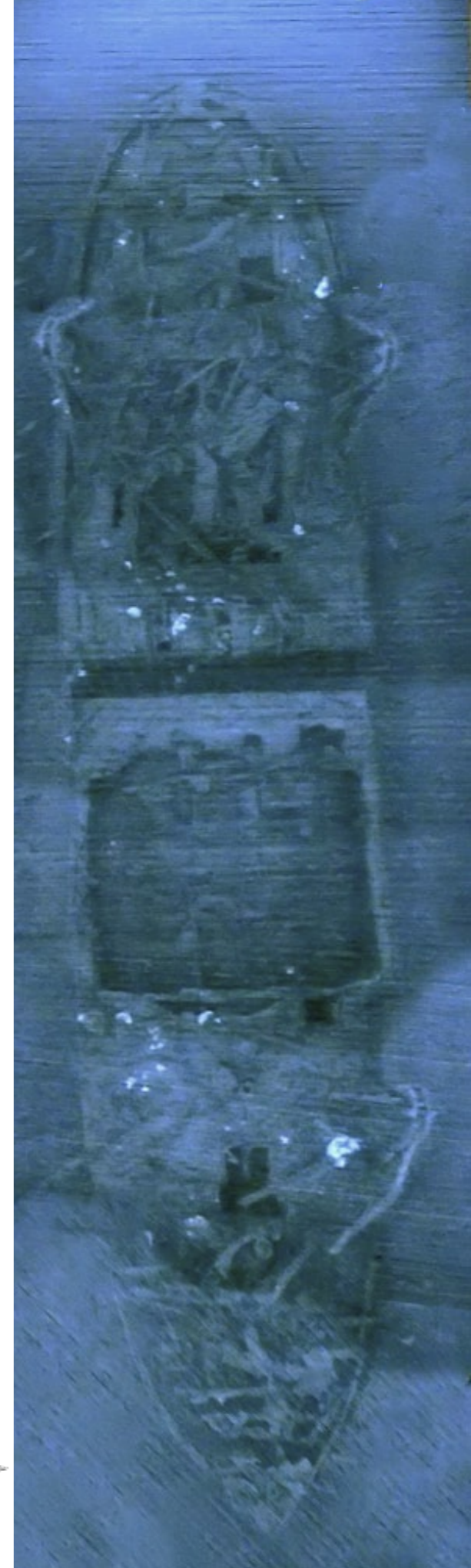
Consistent with U.S. and international policy, both the *Bedfordshire* and the *YP-389* wreck sites are considered war graves and are protected by United States and international laws, including the Sunken Military Craft Act, which prohibits removal of artifacts and any alteration or disruption of the wreck site.

"The story of the *YP-389* personifies the character of the Battle of the Atlantic along the East Coast of the United States, where small poorly armed fishing trawlers were called to defend American waters against one of Germany's most feared vessels," said David W. Alberg, expedition leader and superintendent of the Monitor National Marine Sanctuary. ■



Lockheed T-33 on display

Photo mosaic of *YP-389* shipwreck





## Black Sea Shipwreck

On August 2009, archaeologists found a well-preserved, 100-foot (30m) shipwreck dating back to the 18th or 19th century at a depth of 460 feet (140m), approximately 5.6 miles (9km) offshore, while testing a remote-controlled, deep-submersible research vehicle.

Loaded with stone sheets, the vessel's deck covers "are broken up and the cargo can be seen – marble or granite slabs" according to Sergey Voronov, a top Ukrainian underwater archaeologist. "In those times, active construction was underway in Crimea, and we

suppose that the slabs were intended to be used at the construction of one of the palaces on Crimea's southern coast," said Voronov.

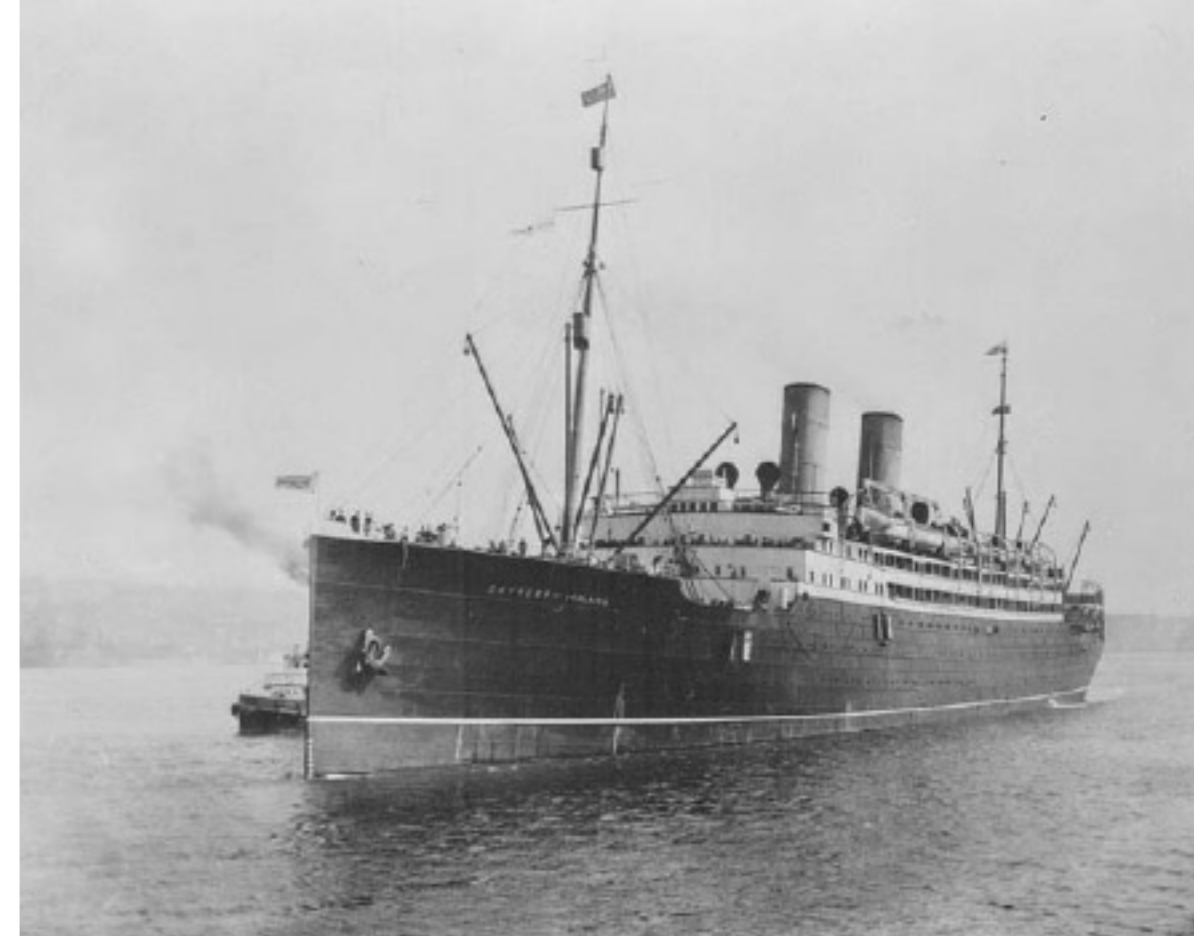
Since both masts on the wreck are broken,

Voronov believes that the sailing boat capsized and sunk during a storm. "Another possibility is cargo displacement inside the ship."

Nicknamed *Grin's Brigantine* due to its similarity to the ship described in prominent Russian writer Aleksandr Grin's novel, *Scarlet Sails*. The vessel won't be raised anytime in the near future, according to the archeologist. ■



Russian author, Aleksandr Grin



RMS *Empress of Ireland*, 1908. She was an ocean liner operated by Canadian Pacific Steamship Company. On the morning of 29 May 1914, the Norwegian collier, *Storstad*, crashed into the side of the *Empress of Ireland*. With severe damage to her starboard side, she sank within 14 minutes. A total of 1012 passengers and crewmen were lost

## Out with the Old, in with the New

The 138 meter long, 4100-ton, missile-guided frigate *HMAS Canberra*, was sunk off Victoria's coast early in October. Built in 1978 and launched two years later, the Australian vessel served for 24 years before it was decommissioned, in 2005.

Resting at 30 meters deep, it will become a local scuba diving attraction as well as a new artificial reef that will help with the much needed ocean preservation efforts. It is expected that the new reef will be populated with fish as it began its underwater adaptation.

For wreck scuba diving enthusiasts, such as John Lawler, advocate and founder of Victorian Artificial Reef Society

([www.vars.org.au](http://www.vars.org.au)), started in 2006, the sinking was a result of hard lobbying with the Australian Navy.

"As a scuba diver, I'm extremely excited about diving on a wreck like this," declared the 66-year-old diver, after witnessing the ship go down some 3 km off Barwon Heads, on the Bellarine penin-

sula. "It's like Christmas," he added. The area is populated with 46 other wrecks, and is locally known as the "Ship's Graveyard".

Recreational diving will be allowed once commercial clearance divers make sure all sinking charges had been properly detonated and moorings are installed by Parks Victoria, the government's preserve authority, ([www.parkweb.vic.gov.au](http://www.parkweb.vic.gov.au)) sometime at the end of the year.

Mr Lawler, cannot wait to visit the site. "As soon as it's open, if the weather's fine, myself and some of my diving buddies will be out on the site as quick as we can." ■



### HMAS Canberra Sinking



Click on the image to see the report on the sinking of the HMAS Canberra

## Empress of Ireland shipwreck named National Historic Site

Nearly a century after the *Empress of Ireland* sank in the St. Lawrence River and took the lives of more than 1,000 passengers and crew, the wreck of the elegant luxury liner that represents Canada's worst maritime disaster has finally been declared a national historic site.

The *Empress* was a luxury passenger ship that offered 570 feet of elegance and first class luxuries. Teak decking, gold trimmed plates, first class dining, first class music room where a

five-piece stringed orchestra would perform and spacious sleeping quarters; the *Empress* was a beautiful ship.

The steamship crossed the Atlantic Ocean regularly for about a decade before it left Quebec, on 29 May 1914, with 1477 people aboard and travelled down the St. Lawrence Seaway where it was caught in a heavy fog. While approaching the mouth of the river in the evening a lookout spotted a ship rapidly approaching

the *Empress* on the starboard side. The *Storstad* had taken action to pass the *Empress* port to port but instead ran the ship directly across the path of the *Empress* and collided with her on the starboard side bow area. The engine room flooded within minutes with the brackish seawater, which shorted out the ship's engines, water tight doors, and the electricity. The *Empress* was only able to get one S.O.S. message out before they lost power and sank in 30 metres of water. ■



This Ancient Roman marble statue from c. 191-192 CE, which was also found in an underground chamber in the area of the Horti Lamiani in 1874 and is now housed at the Palazzo dei Conservatori, is of the Greek god Triton, who was the son of Neptune, god of the seas



WIKIPEDIA

## Blue Grotto reveals ancient roman statues

Celebrated for its incredibly blue waters and mysterious silvery light rays, the Grotta Azzurra (Blue Grotto), is one of Capri's top attractions. The grotto was roman Emperor Tiberius' private swimming pool (42 B.C. - 37 A.D.).

beneath its waters, according to the results of an underwater survey.

Rosalba Giugni, president of the Mare Vivo environmentalist association ([www.marevivo.it](http://www.marevivo.it)), declared: "A preliminary underwater investigation has revealed several statue bases which might possibly hint to sculptures lying nearby,"

Carried out in collaboration with the Pompeii archaeological authority ([www.pompeiisites.org](http://www.pompeiisites.org)), the Mare Vivo project aims at returning the Blue Grotto to its ancient glory by placing identical copies of Tiberius' statues where they originally stood. ■

A number of ancient Roman statues were recently discovered lying



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### Blue Grotto (Grotta Azzurra) in Capri island



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# Shipwreck Appreciation & Conservation

**Many divers already know that you shouldn't remove artifacts from a shipwreck. In addition to being illegal in most parts, doing so can also be dangerous. Diving some wrecks requires specialized training and experience.**

In the province of Quebec, Canada, all divers are required to have a special license. Simply

having a certification card from a recognized dive instruction agency, such as PADI, isn't good enough. Every diver must have their ability assessed by a provincially-accredited instructor before they can dive. This can mean a foreign diver, even a highly qualified and experienced, and/or vacationing one, having to perform a skills test in a swimming pool.

Likewise, it's becoming increasingly common for novice divers to be restricted from diving some

"advanced" wrecks. These are typically deep-water wrecks or wrecks that have other hazards and require a high degree of diving skill and experience.

One such wreck is the *Empress of Ireland*—which lies at the bottom of the St. Lawrence River near Rimouski, Quebec. The late great liner is a spectacular but challenging dive. It's been called, "the Mount Everest of scuba".

And, for good reason. A handful of recreational divers have died on the wreck. In addition to requiring a provincial diving license, every *Empress* diver is also required to be "Advanced" certified and have at least one hundred dives under their belt beforehand.

## Fine, jail or worse

Most jurisdictions have laws that govern specific dive sites, such as shipwrecks. You can be fined, or worse, end up in jail for taking arti-

facts from a shipwreck. Any judge will tell you, "Ignorance (of the law) is no excuse."

The important thing is to make sure you know the relevant local laws before you dive. Better yet, before you arrive. Your travel agent, or dive tour operator, should be able to tell you about the rules and regulations pertaining to a particular site.

A military ship remains the exclusive property of its flag country at the time of its sinking. If you remove an artifact from such a wreck, you may find yourself in an international court, or up against a foreign government. Some war wrecks, such as the Civil War casualties, *Monitor* and *Alabama*, are off-limits to recreational divers.

A diver may also be required to purchase a permit or license before they can dive. The money generated from the sale of such permits is used to interpret and conserve the site.

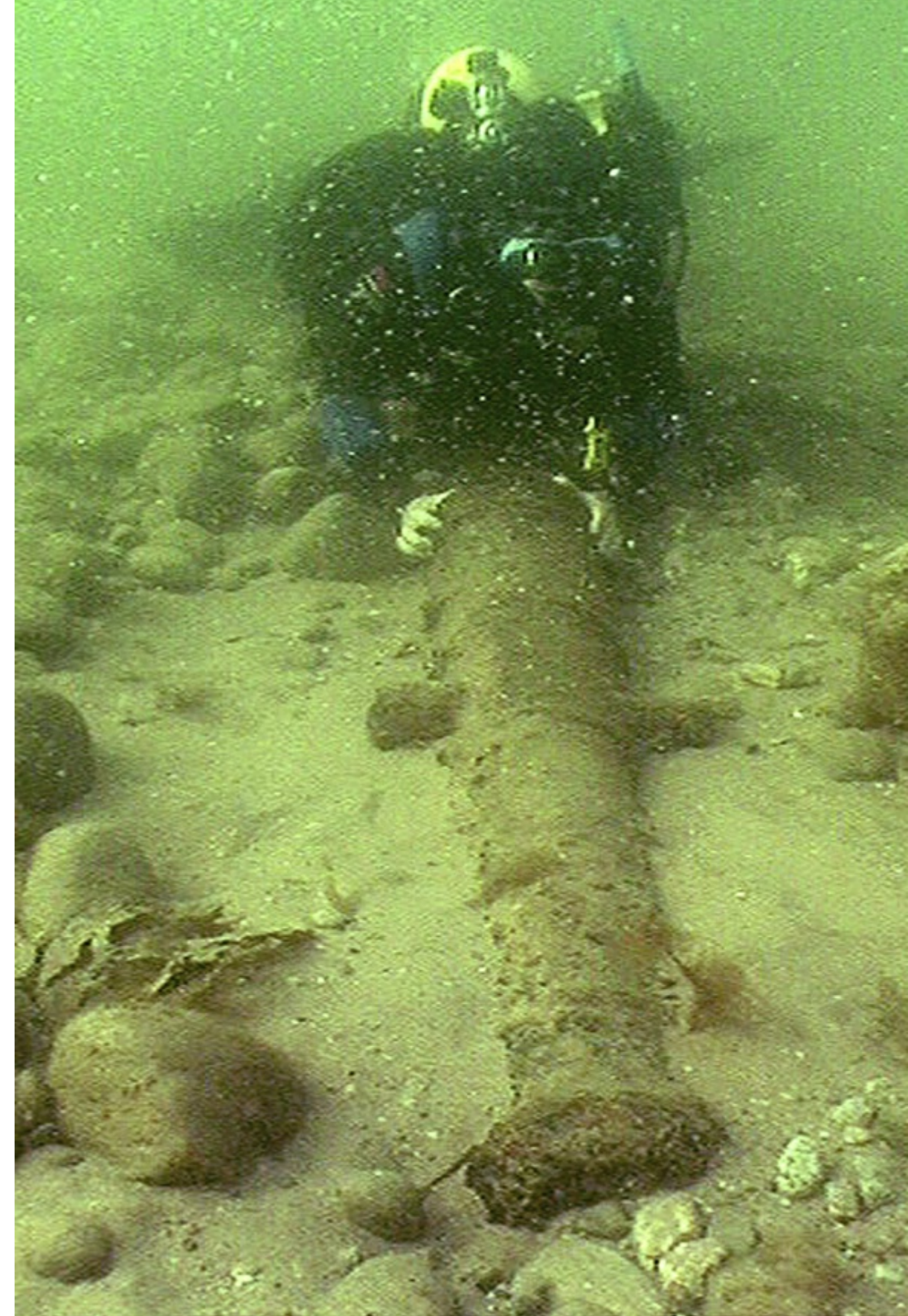
Removing artifacts can also cost you your life. Not only can it be physically demanding, but being involved in such activity can cause a diver to lose track of

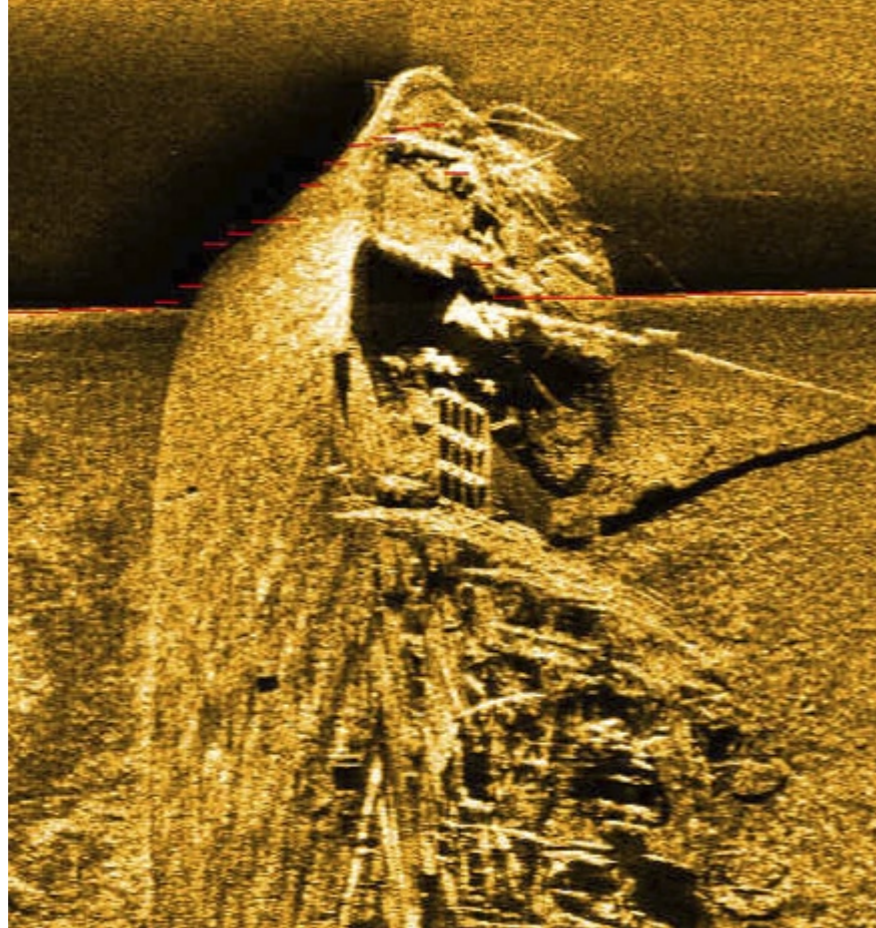
their bottom time or depth—putting them at risk. Overexertion can also increase a diver's risk of decompression sickness.

In addition to risking injury, or a

lawsuit, there's another good reason not to remove artifacts. Every time a diver removes something from a shipwreck, there's one less thing for the next diver to see.

RIGHT: Diver investigates half-buried canon. BELOW LEFT: Children examine a model of a shipwreck





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**Not politically correct**

In the old days, taking artifacts demonstrated a diver's prowess. If a ship's bell or bridge gear was there, it meant you were the first to dive the wreck. So, you took it. But, like lots of other former past-times, such as big game hunting and scalping Indians, taking artifacts from shipwrecks is no longer socially acceptable.

Once an artifact is removed from the water, it quickly deteriorates. If you remove something and it's not properly conserved, it will likely turn into a pile of rust. And, when you take an artifact, you reduce the historical and archaeological significance of the wreck that it came from.

I can't tell you the number of times I've returned to a shipwreck to find that artifacts have been removed—often illegally. And, sometimes in their pursuit of artifacts divers have destroyed parts of the ship. Surveying the damage, you feel violated. If you've ever had your house or apartment robbed you'll know what I'm talking about. But, what's most frustrating is knowing that most divers were acting out of ignorance.

Likewise, it's equally frustrating when you're taking divers on a tour of a wreck to find that artifacts have been removed. You've told them about what

they can expect to see on the dive. When it's not there, they feel cheated, and you feel foolish.

Wreck diving can lead a diver into areas of academic research and study. I know lots of divers who would, otherwise, never have found their local public library. Researching shipwrecks can be a rewarding activity in itself. A friend of mine calls it, "his drug of choice".

The old adage, "take only pictures and leave only bubbles", is still the best approach when it comes to appreciating and conserving shipwreck artifacts. And, it's a good way to meet other divers, hone your skills and stay interested in diving. ■

—Rob Rondeau  
Marine Archaeologist  
ProCom Diving Services  
[www.procomdiving.com](http://www.procomdiving.com)

CLOCKWISE FROM TOP LEFT: Sonar scan of a wreck; Examining and researching found artifacts; Let others also enjoy a display of found historical artifacts from a ship wreck







# 1911 Dreamland Bell found

In May 1911, Coney Island's Dreamland Park was in flames for a full 18 hours and burned itself into the sea, destroying the pier around it.

In September 2009, local divers discovered a 500-lb bell that sunk to the ocean floor with the rest of the park 98 years after the flames died down. It is three feet high and inscribed with "James Gregory, NY, 1885"—founding member of the Gregory Brothers Circus.

Diver Gene Ritter, part of the recovery

team, declared that he knew the bell existed, but never dreamed he would find it. "I thought it would be buried in mud. I was stunned, especially over the incredible shape the bell is in."

Ritter found the bell quite recently, but it has been 18 years since he first came upon Dreamland's remnants in the ocean.

As to the bell itself, it is yet uncertain if it will ring once again, after being fully restored. ■

The Dreamland Bell of 1911 and diver Gene Ritter who found it under the waves. Image courtesy of the website dedicated to the find, in construction, [www.dreamland-bell.com](http://www.dreamland-bell.com)



# US Navy Shipwreck from War of 1812 to be excavated



US NAVY HISTORICAL CENTRE

The first *USS Scorpion* was a sloop-rigged self-propelled floating battery in commission in the United States Navy from 1812 to 1814.

The wreck, which is one of the war's most significant artifacts, was discovered nearly 30 years ago, but after a limited, month-

The shape and arrangement of sails on an American privateer schooner, brig or brigantine, are quickly movable to much more radical angles. English seamen have written that they saw privateers escaping "sailing directly into the wind."

long excavation of the site east of Upper Marlboro in 1980, the wreck was reburied under four feet of mud and sediment to protect it from decay.

The US Navy, which still owns the flotilla, is considering whether to excavate the site and possibly raise the vessel as part of its plans to commemorate the bicentennial of the War of 1812. ■



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Edited by  
Scott Bennett



## Smile with a crocodile!

Come face to face with one of the world's biggest and most dangerous predators in the Philippines.

Being in the water alongside a saltwater crocodile is an experience most divers would like to avoid at all costs. Philippines-based Buwaya Adventures now offers the unique opportunity to observe and photograph salt-water crocodiles in their natural habitat. Get up close and personal with these magnificent reptiles in the mangrove swamps of the island of Palawan. Most images published in magazines feature

salties in the clear waters of coral reefs, but now divers will be able to observe them in their preferred habitat.

Excursions will be guided by German photographer Dieter Heimig and his Philippine wife Maygen. Both are long-time Philippines experts, having led more than 30 excursions to some of the island state's most far-flung regions. Safety is paramount, thanks to strict safety precautions and a team of professionals including a trained biologist and a crocodile expert. ■

SOURCE: SALTIES.DE



## Media sensationalism surrounding dive deaths plague Queensland industry

Already hurting from the economic downturn, worldwide publicity surrounding high-profile fatalities has continued to plague Queensland's dive industry.

The recurring headline "dive death" is partly responsible for crippling the the local dive industry according to North Queensland tour operators. Although the state's tourism industry is flagging generally, dive tourism has declined 30 percent in the past 12 months. The release of the film *Open Water*, loosely based on the disappearance of divers

Thomas and Eileen Lonergan off Port Douglas in 1998, did nothing to help the situation. Since then, the death of honeymooner Tina Watson, left to drown by her husband Gabriel 'Gabe' Watson in 2004, garnered international headlines, as did the ensuing court case earlier this year.

The industry is also incensed at coverage of people who die of medical conditions while diving, which can leave businesses struggling to convince tourists that scuba diving and snorkelling in Queensland is safe. One problem was that the

media was too quick to brand fatal incidents "dive deaths" regardless of the circumstances, Queensland Dive Tourism Association general manager Col McKenzie said, "You can come to Australia, and Australia will give you world-quality diving which is very, very safe, but we can't guarantee you won't suffer a heart attack," Mr McKenzie said. A spokesman for the Maritime Union of Australia said there had been two deaths involving the North Queensland dive industry in the past 12 months. ■

SOURCE: WATODAY.COM.AU

## Two new artificial reefs created in the Bahamas

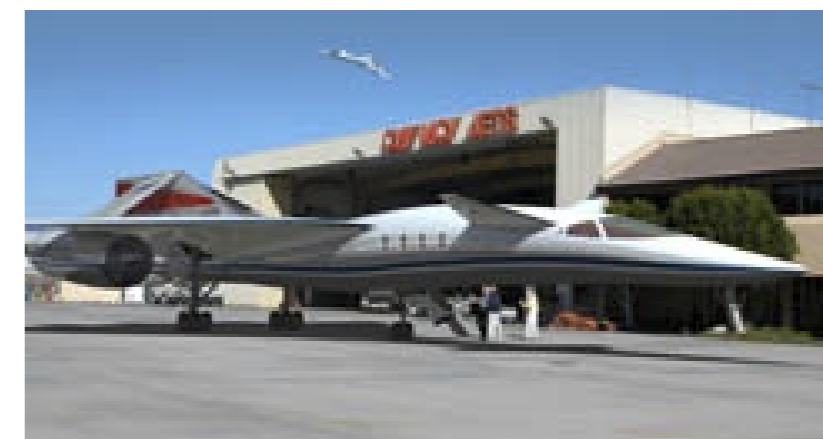
Stuart Cove's Dive Bahamas has announced two new wreck dives are now accessible to scuba divers visiting Nassau. The result of a joint effort between Stuart Cove's and the Bahamian government, the *Anthony Bell* and the *Long Island Lady* are the latest in a series of wrecks established off the coastline of this popular island destination. To date, nearly 20 wrecks have been created to help increase the health of the underwater environment.

The *Anthony Bell*, a decommissioned 90-foot tug boat, was sunk in 50 feet of water off the south side of Goulding Cay in mid-August. The *Long Island Lady* is a fishing boat that sat neglected in the Nassau harbour for a number of years. After being thoroughly cleaned up by volunteers, the vessel was then moved out to her sinking this past June. The 70-foot vessel sits on a rocky bottom at about 40 feet next to the tongue of the ocean wall that drops down to 6500 feet.



Click on image to watch the sinking of the *Anthony Bell*

Stuart Cove's Dive Bahamas offers a variety of wreck diving packages in addition to other diving options. For additional information, go to [www.StuartCove.com](http://www.StuartCove.com) ■ SOURCE: EXAMINER.COM



## New supersonic aircraft is set to revolutionize 21<sup>st</sup> century air travel

With a non-stop range of more than 4,000 nautical miles, the Quiet Supersonic Transport (QSST) is set to revolutionize air travel in the 21st century. Up to twelve passengers will be able to travel in large cabin comfort to global destinations in half the time taken by conventional aircraft.

Flying at uninterrupted supersonic speeds over land and sea, QSST is the only jet with a patented design to revolutionize travel with a low "shaped sonic signature" which is over 100 times quieter than the recently retired Concorde. Advanced technologies will help to reduce takeoff and landing sound, making it virtually indiscernable to people on the ground below.

J. Michael Paulson founded Supersonic Aerospace International (SAI) in 2000 to fulfill his late father's dream of making quiet supersonic flight a reality. SAI's vision, plan and team, coupled with Lockheed Martin's superior technical design, will make this concept a reality. ■ SOURCE: SAIQSST.COM

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# Equipment

*Crank it up!*



Edited by  
Arnold Weisz

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



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The inflatable dive Kayak is designed to provide stability and versatility. By incorporating three fins in the rear, this kayak has great tracking ability in waves and wind, and is extremely stable and manoeuvrable. In the rear is a tank cradle to secure your gear as you paddle. 420 Denier Nylon top deck with tarpaulin rear deck and underside, heavy-duty nylon straps with buckles to secure tank and equipment, metal "D" rings to clip your equipment to prior to entry and exit, velcro straps to secure paddle, inflatable seat with high back support for comfort. Weight: 40 lbs Max Capacity: 425 lbs [www.barescubadiving.com](http://www.barescubadiving.com)

## Aqualung Pro LT

The Pro LT weight-integrated, jacket style BC is the latest addition to Aqualungs family of "Pro" BCs. It packs features, style and durability into an affordable package. Weight integration features the SureLock™II (patented) mechanical lock and release mechanism. The weight pockets align themselves. A simple, single-pull release is all that is needed to jettison the weights in an emergency. A new, proprietary backpack has a built in traction pad to reduce tank slippage as well as a built in carrying handle. [www.aqualung.com](http://www.aqualung.com)



## Beuchat VR200 Evolution

Designed for diving in temperate or cold waters and fitted with Beuchat's patented "anti-freeze system". The second stage is fitted with a thermal exchanger which protects the system from freezing during cold water dives. According to the manufacturer this design makes it very stable down to 100 meters depth. 4MP ports and 2 HP ports, balanced and adjustable second stage and adjustable venturi flow.

[www.beuchat.fr](http://www.beuchat.fr)



## Tusa IQ-750 Element II

The Element II can be operated as an Air computer, Nitrox (EANx) computer, a digital depth gauge/timer or as a free dive depth gauge/timer. Features include: Water-activation, 2 Mix Gas Switching ability, a large alphanumeric and backlit display, audible and visual alarms, advanced user safety settings, and PC download/upload. The IQ-750 adds a Deep Stop function for enhanced safety. The deep stop mode is activated when a dive exceeds 80 FT (24M) for more than 1 second. Upon ascent. Additional features; advanced 3 button puck-style module in wrist boot, audible and Flashing Icon Alarms, 1 touch log access, automatic altitude adjustment from sea level to 14,000', a user-replaceable battery. [www.tusa.com](http://www.tusa.com)





Trying out Poseidon's Discovery / CIS-Lunar Mk 6 Closed Circuit Rebreather

## Don & Dive CCR



**Poseidon's compact Closed Circuit Rebreather is fully automated and aimed at the recreational diver. We wondered how well it met its design target, so we took it for a spin.**

Poseidon's Discovery was listed in Popular Science magazine's Best of What's New awards in 2008

The mouthpiece is fitted with a bailout switch—the lever on the top left. Flip the lever to horizontal, and you breathe from the open system instead of the closed circuit. Essentially, it is a regular second stage that has been combined with the rebreather mouthpiece

It was not without some positive anticipation that I went to Poseidon's compound on the outskirts of Gothenburg—Sweden's second largest city. As long term readers of this magazine are aware, I have been following the development of their new rebreather from the sidelines for quite a while. Now, I was going to take it for a dive.

Getting it going took just a few easy steps. First, you analysed and verified your breathing gas with an analyser—a routine of which any nitrox certified divers are well familiar. Next, you assembled the unit, which was quickly done. The components—loop, electronics and canister—all seemed to just snap or click into place with no further ado.

Once it had been rigged, the user then performed what is referred to as a 'negative test', during which the diver creates a vacuum in the breathing loop simply by sucking out air and then closing the mouth piece. The hoses should remain deflated. If they popped back into shape, it meant that the unit wasn't tight, and all connections and seals had to be rechecked.

Once this test was passed, the unit could be switched on, and from here on, the electronics performed another 35 different tests, including a 'positive test' during which the loop is slightly over pressurized, again to check for leaks—prompting the user to i.e. open valves or close the mouthpiece.

The diver just has to follow the instructions. The whole sequence takes three to four minutes after which the unit is ready to dive.

### Into the water

So, I slipped into the harness and tightened the buckles. The unit was no heavier to wear than a standard scuba system and felt like a compact backpack. I slid into the water and immediately got to appreciate the silence that is the hallmark of rebreathers.

At first, I found the unit to be a bit top-buoyant, but that is not unusual in rebreathers due to the breathing loop. This is often countered by placing some of the weights somewhere on top of the unit. In this case, tightening all the straps for a snug fit did much of the trick, and it soon felt very comfortable.

The low weight and compact profile of the unit, where the centre of gravity sits so much closer to one's body than in other and much bulkier rebreathers, was something I soon came to appreciate. When diving a closed circuit rebreather, I often feel embedded in bulky equipment like a medieval knight in armour who has to be hoisted onto his horse. By contrast, this unit was light and as easy to wear as a standard open circuit system.

### Bailout valve

My only gripe was that the mouthpiece was tugging on my jaw, but that seems to be a common problem for all rebreathers. Switching to open circuit in case of a bail-out is simply accomplished by flipping the lever on the mouthpiece. Opening and closing it comes easy.

I did a couple of standard routines such as taking off the mask and going on open circuit and back, and again, the task load at any given point seemed pretty similar to what you would do with a standard scuba system. I ended up getting a little water into the mouthpiece, but a barrel-roll to the right drained the water into the water trap and down the counterlung from where it could be purged. That manoeuvre also cleared that annoying gurgling sound.

Clearing a mask while on closed circuit



is also similar to performing it on open circuit except that the diver needs to exhale just the exact amount of air, and no more, to purge water from the mask in order not to waste gas unnecessarily.

### Comments

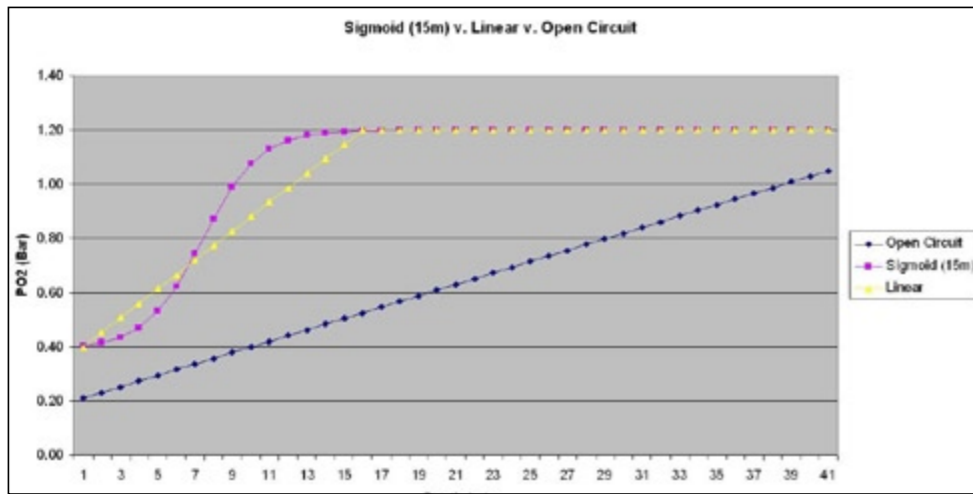
Overall, I found diving the Discovery was an uncomplicated, relaxed and enjoyable experience—a bit like driving an automatic car rather than a stick shift.

The build felt reassuringly solid and well thought out with the few kinks seen on the prototypes now ironed out. According to Poseidon's Jens Sjöblom, the unit has now been extensively tested and dived in many parts of the world under a wide variety of circumstances, and the software has undergone 42 builds during the process of refining it.

The unit is supervised by what is called a Resource Management Algorithm, the function of which is, put simply, to combine or merge the functions of the dive computer with the monitoring of onboard supplies (gas, battery life, scrubber, etc) and operation (i.e. sensor integrity) into a single instrument display that tells you everything you really need to know—essentially, how much dive time the diver has left before he or she runs out of air or goes into deco.

### Limitations

As the Discovery is specifically built with the recreational diver in mind, not the tech diver, it comes with a number of



The Discovery performs an automatic smooth transition from low at high setpoint (the sigmoid purple curve). See sidebar for further explanation.

preset limitations. It is rated to max 40 meters and is not meant for decompression diving, though it will continue to function and provide life support should the diver accidentally end up in the decompression zone or exceed any other limits.

Should this happen, or any other problem, an alarm will go off. A cascading system of alerts with a light and a vibrator on the mouth-piece as well as buzzer in the battery compartment will draw the diver's attention to the display on which is shown what the issue is.

### Notable feature

If I am to pick out from my extensive notes a notable function, or feature, my choice would be how the Discovery handles pO<sub>2</sub>-setpoints. In most rebreathers, the diver changes the setpoints up and down at his or her discretion; typically the switch is made around six meters. Switching to the highest point means injection of oxygen into the breathing loop creating a buoyancy spike, which has to be countered i.e. by simultaneously dumping gas from a suit or BCD. The Discovery removes both these potential stressors by applying a smooth and automated transition of the pO<sub>2</sub>-setpoint which goes from 0.5 bar pO<sub>2</sub> at the surface to 1.2 bar pO<sub>2</sub> at 12 meters. This way, there will be no sudden or discern-

able changes in buoyancy, nor does the user need to worry about doing the changes.

### Facing the music

As with so many other rebreathers, this one too has been greeted with both criticism and scepticism—just like what the Inspiration CCR was subjected to when it came out. Some of it is fair, factual and relevant, but most of it not.

Is it perfectly designed? Surely not—no machine ever is—and accidents will ultimately happen. But the Discovery seems quite well-designed, and from what I am able to judge through just a single try dive, asking a lot of probing questions, and going over the documentation, it is evident that at lot of time, money and good thinking was sunk into the development of this unit.

At a glance, it thus appears to have fulfilled its design criteria of being a straight forward automated CCR for the recreational divers to use. How the market is going to take to it is another question—only time will tell.

The unit is CE-approved, weighs 15 kg including tanks but excluding harness and wing. ■

### Setpoints explained

A Closed Circuit Rebreather can be likened to a transportable nitrox-blender, which always provides the diver with the optimal blend of breathing gases. With enriched air nitrox, we would usually want the oxygen content to be as high as possible, and the content of nitrogen—which is the culprit in DCS—as low possible.

But too much oxygen is not good either. Prolonged exposure to high partial pressure of oxygen can lead to seizures—not a good thing when you are underwater. So, within recreational diving, the upper limit is conventionally set at at 1.3 bar partial pressure oxygen (pO<sub>2</sub>). In the case of the Discovery, 1.2 bar pO<sub>2</sub> has been chosen.

This partial pressure is what the rebreather is trying to maintain at a constant level by varying the oxygen-% in the breathing loop in response to the changing depths.

However, there is a snag with this fine principle; It is impossible to achieve a partial pressure of 1.3 bar at the surface where the ambience pressure is only 1 bar. If the rebreather tried to achieve this level, it would just keep inflating the breathing loop with oxygen perhaps until it popped like a balloon.

Needless to say, we would need to start off with a lower oxygen partial pressure. This is conventionally 0.7 bar pO<sub>2</sub>, which at the surface where there is 1 bar translates into 70% nitrox.

Once one is below the surface, one wants to go from the 0.7 bar to the 1.3 (or 1.2) bar pO<sub>2</sub>. When the change is performed manually, typically at a depth of 6-10 meters, it is referred to as *changing setpoints*.

On many rebreathers, this is done by flipping some switches. Descending, one changes from a low to a high setpoint, and when one ascends, one switches from a high to a low setpoint. ■

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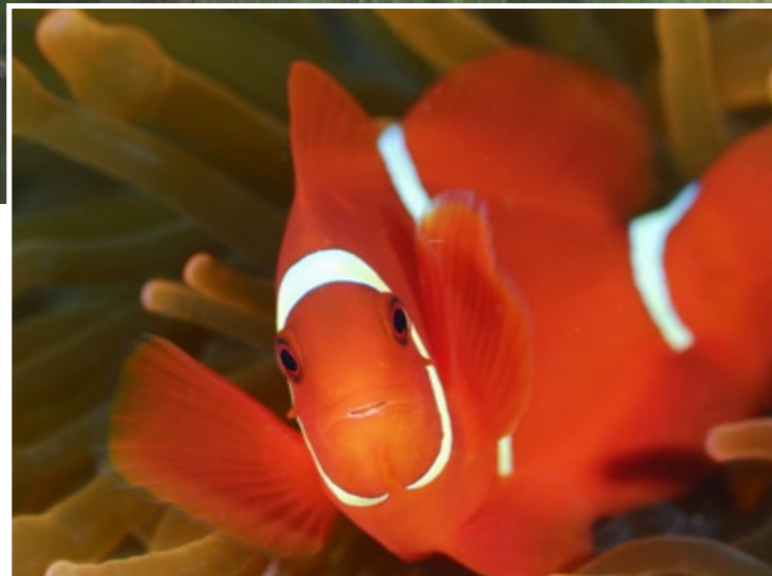
# Reefs & Rainforests

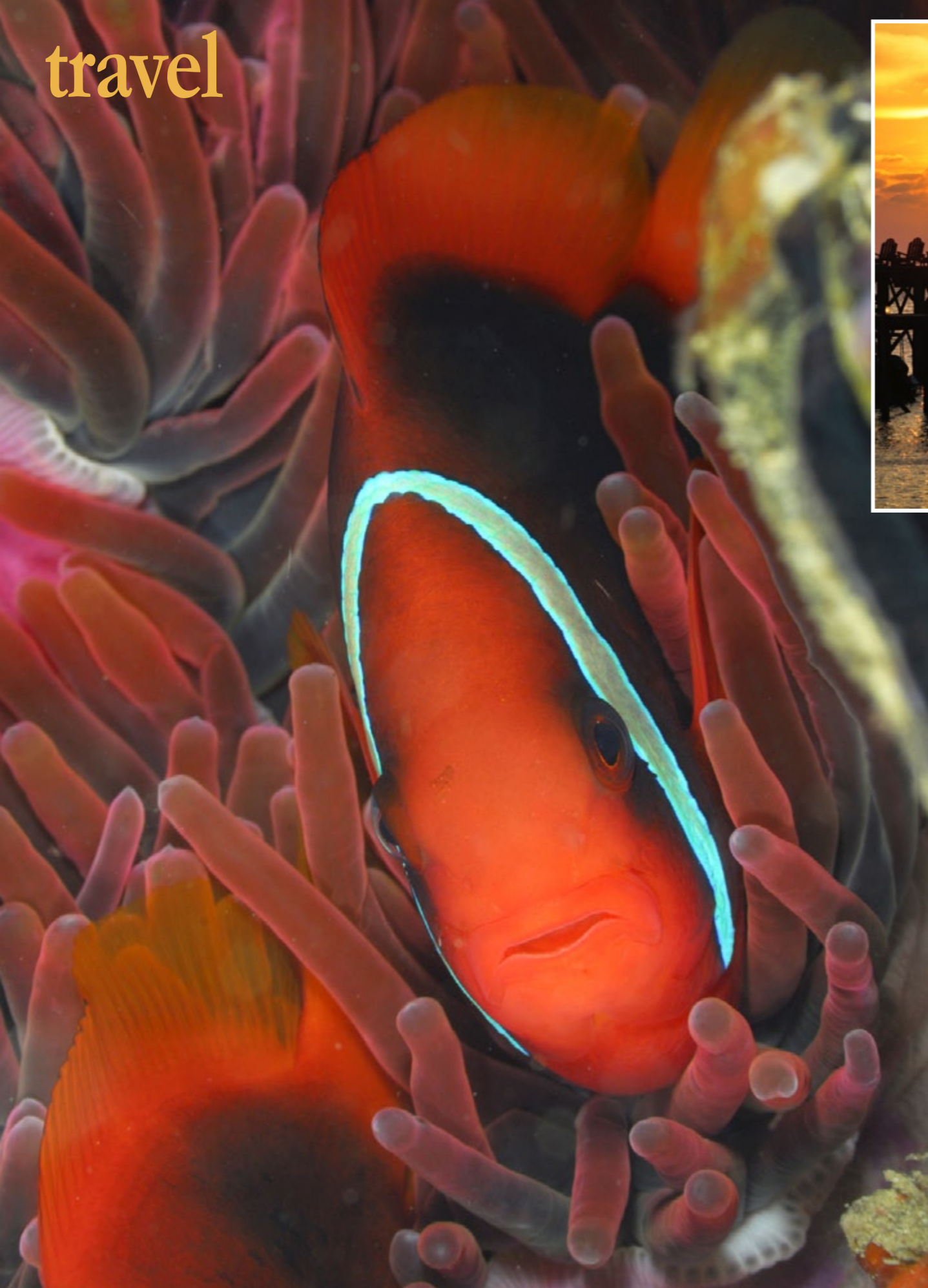
*Conservation Success Stories in Borneo's Sabah*



Text and photos  
by Andrea & Antonella Ferrari  
[www.reefwonders.net](http://www.reefwonders.net)

Encompassing an area of roughly 460 square kilometers just off Northern Sabah's shores, right where Malaysian Borneo's landmass, small offshore islands and international waters intermingle with their Philippine counterparts in the Sulu Sea, lies the Sugud Islands Marine Conservation Area, or SIMCA, for friends. The island of Lankayan and its two neighbouring sisters Billean and Tegaipil have been declared since the year 2000 part and parcel of the protected area in what has since proven—beyond any doubt—to be an extraordinary landmark in the history of eco-tourism.





Bridled anemonefish;  
Sunset on the pier at  
Lankayan; Dive boat  
racing to a dive site



Destructive practices such as cyanide fishing, reef bombing and deep-water trawling—which had been regularly employed in the area for several years by local and Philippine fishermen—are today no more allowed in the surrounding waters. Turtle eggs are regularly collected from nests dug in the sand and safely hatched under controlled conditions for reintroduction in the wild, and many other conservation programmes are now being—and will be in the future—vigorously implemented by Sugud Islands Marine Conservation Area's (SIMCA) managing company Reef Guardian, a private venture working in strict accordance with the Sabah Wildlife Department.

The area within the borders of SIMCA consists of a beautiful environment encompassing small uninhabited coral sand islands, patches of mangroves, huge seagrass beds, shallow sandy flats and an immense number of submerged coral reefs that host an enormous number of marine species, many of which are still wai-

ting to be scientifically described.

SIMCA's main topside landmarks are the uninhabited and sun-scorched islands of Billean and Tegaipil, and of course, the fabled Lankayan Island—the only one with a human presence. Lankayan boasts a world-famous, upper-class, and most of all, eco-friendly dive resort, sitting in splendid isolation on this tranquil little private island in the midst of the Sulu Sea.

Since our first visit to Lankayan more than twelve years ago, we immediately realized there was something special about the place. The island (or "Pulau" in Malay) is strategically situated between the coast of Sabah and the myriad of islands spreading from the Southern Philippines. Its very name means, in fact, "the last outpost". This labyrinthine maze of shallow turquoise waters and jungle-clad sandy cays has hidden and protected for centuries the secret sea lanes used by pirates, poachers, smugglers, and even assassins.

### Marine life

Fish life is unbelievably abundant, luring in fleets of trawlers from both countries and the occasional big game fisherman. It was two of these, Ricky Chin and Kenneth Chung—two friends from the nearby coastal town of Sandakan—who discovered it several years ago during one of their big game fishing forays, and who made friends with Haji Bambi, the only man who back then was living there, after a life rich in adventures in the sea between Sabah and the Philippines.

To make a long story short, their meeting was at the origin of Pulau Lankayan as we know it today—a small, pristine tropical island on which a quiet, elegant resort caters to the needs of discerning divers and vacationers from the world over. A perfect holiday destination, the place—a tiny dot in the Sulu Sea about one-and-a-half hours by speedboat from the coastal town of Sandakan in Malaysian Sabah, on the island of Borneo—is a gorgeous, picture-



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Battfish in coral garden; Sundeck at Lankayan Resort; Diver with large anemone

perfect cay, boasting pure white sandy beaches and a lovely, garden-like jungle interior, offering the exhilarating diving one has come to expect from Sabah's dive sites (shallow coral reefs, unsurpassed macro life, undescribed new species waiting to be discovered, big fish action, enormous biodiversity, interesting wrecks).

Add to the mixture an exquisitely styled, upscale resort, elegant and comfortable twin-sharing seafront chalets with private and well-appointed bathrooms, an open-air restaurant offering great food and a spectacular sundeck with an endless expanse of turquoise water just a few feet below, and you'll see why we love the place.

Here's a private exotic island where even non-divers can enjoy the perfect holiday, relaxing on the beach or snorkelling in the crystal-clear shallow waters of the lagoon, while sea eagles fly over, their piercing screeches tearing the sky

in the distance, and the jungle-shrouded mountains of Sabah tower on the horizon, bathed in golden glorious sunsets.

An informal, friendly, casual atmosphere adds to the pleasant feeling of "away-from-it-all" relaxation. Everything is so well spaced out and cleverly planned you might sometimes think you're all alone by yourself on the island.

**Diving**

The diving is at shallow to medium depths, always enjoyable, never risky or fatiguing. The dive center is well equipped and ideally situated at the end of the long jetty. The island staff are, if possible, even more cheerful and willing to help than in the rest of Sabah, Malaysia—a country remarkable for its extraordinary tradition of hospitality.

Small species here—many absolutely fascinating and quite a few still undescribed by science—reign supreme: resplendent gobies, unbelievably colourful nudi-

branches, dwarf cuttlefish, fluorescent fire urchins with attendant crabs and huge lobsters dot the sand and coral bottom of each and everyone of the thirty-plus dive spots Lankayan offers at the moment.

The list of rare species regularly observed here includes robust and ornate ghost pipefish, frogfish, mandarinfish, blue-ringed octopus, wonder octopus and giant jawfish. Larger sightings along the reef include lots of harmless bamboo and coral cat sharks, blue-spotted rays, yellowtail and chevron barracudas, huge shoals of scads and robust fusiliers, giant bumphead parrotfish, a large variety of scorpionfish and lots of leopard (or zebra, as they are sometimes called) sharks.

Chance encounters with bigger fish are not uncommon: very large adult blacktip sharks are commonly observed in several of Lankayan's outer dive sites, whale sharks patrol in season the open





Sabah

CLOCKWISE FROM BOTTOM LEFT: Linedcheeked wrasse; Lionfish; Snorkeler in bay at Lankayan; Mug shot of moray eel



water between the island and the mainland, while giant guitarfish—locally known as malumu—are a rarer sighting.

During our most recent trip there, we bumped into a three-meter long Galapagos shark leisurely cruising at a depth of five meters, and many of our Sabahan friends have told us about occasional tiger shark sightings.

A fascinating array of spectacular species is also encountered at the two wrecks in the vicinity of Lankayan: the imposing remains of a huge Chinese wooden fishing vessel sunk on purpose—now home to giant groupers, giant marbled stin-

grays, frogfish, scorpionfish, lionfish and huge shoals of pelagics—and what is left (very little, alas!) of an historically significant armed barge belonging to the “Mosquito Fleet”, which served the Japanese and sunk during World War II.

One word of advice: due to its close proximity to the coast of Sabah with its attendant run-off from big muddy rivers and oil palm plantations, underwater visibility at Lankayan is usually far from perfect, even if there are unpredictable exceptions.

While this is of no consequence at all for macro photographers and videographers, it may prove quite frustrating

for wide angle lovers and big fish addicts, especially since it quite common encountering large animals during the course of a single dive (our record is five leopard sharks, one huge mangrove stingray, a whale shark and a roving pack of five adult blacktip sharks in one day!).

Lankayan is a macro life paradise with few comparisons but no destination for wide angle photographers, and divers must think of it more in terms of a successful conservation story than as a gin-clear water destination. As a tropical island destination for honeymooners, snorkellers, diving families and macro rese-





CLOCKWISE FROM BOTTOM LEFT: Blenny; Eggs in the oven; Eye of blue spotted stingray; Goby on hard coral; Leopard shark resting; Scorpionfish; Map puffer fish



archers, it has however very few equals anywhere.

But to Ken Chung, managing director of PSR—the dive resort company which also owns and operates Kapalai resort, close to world-famous Sipadan Island, and the jungle resort in Sepilok—there is more to Lankayan than just tourism.

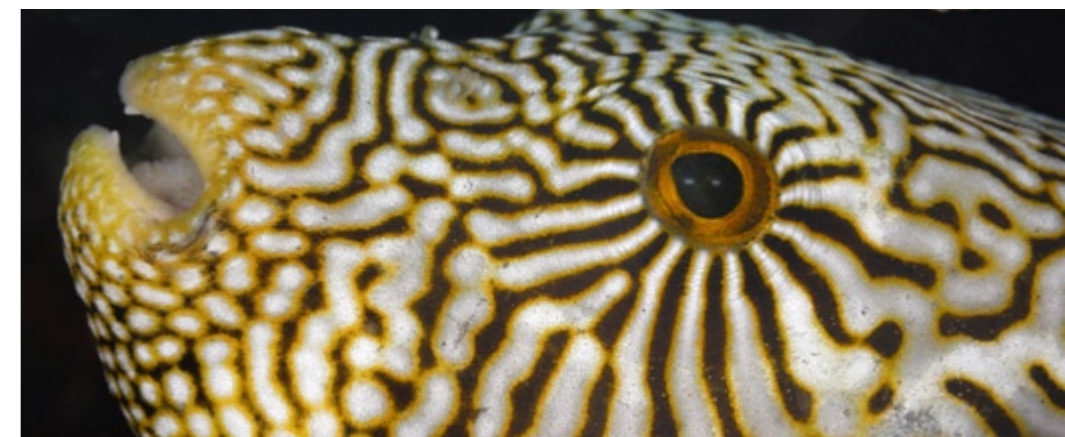
With the passing of time, Ken Chung realized the intricate environment of Pulau Lankayan and its surrounding coral reefs were going to be endangered soon. The very same marine life which attracted tourists and divers from all over the world was acting as a beacon for fishing boats, raiding these waters in always greater numbers.

Local fishermen and their counterparts from the Philippines would not hesitate to resort to highly destructive fishing methods, largely and for a long time in use on Sout East Asian coral reefs: fish bombing (in which home-made and quite dangerous bombs consisting of a bottle full of fertilizer are thrown in the water or on coral reefs), cyanide fishing (in which the noxious chemical is squirted using a spray bottle among the nooks and crannies of the reef to stun fish

later sold to Chinese restaurants) and trawling (with weighted nets which scrape the sea bottom floor, destroying everything in their path) would soon take their toll if left unchecked.

The first tentative conservation efforts soon paid off: feeding a resident population of baby and juvenile blacktip sharks encouraged the endangered predators to stick close to the island reefs, away from roving fishermen in the open sea; scores of hawksbill and green turtle eggs, laid in the sand by their mothers, would be dug out and hatched inside fences which protected them from predators, and hatchlings would be carefully released into the sea; the cutting of trees and shrubs on the island would be kept to a minimum, and all trash and refuse would be carefully disposed of.

We were there all the time, twice a year, to see and follow the growth of an eco-friendly mentality on the island. Year after year, we noticed how the steps taken in the right direction would not interfere with the functioning of the resort, the relaxed, laid-back atmosphere, which still unfailingly impresses first-





CLOCKWISE FROM RIGHT: Whale shark, the largest fish in the sea; Two baby sea turtles make their way to the open ocean; Copperband butterflyfish (inset); Two Coleman shrimp on fire urchin; Feather coral and sponges

sightings we missed but many others did not, and we were the first ever to capture on film the incubation of eggs in the oral cavity by the endemic Giant jawfish.

We swam with huge Whale sharks, we witnessed the violent courtship ritual and subsequent mating of Leopard sharks, and we found lovely Zebra crabs and Coleman's shrimps tucked among the venomous spines of fire urchins. Marine life was improving, the unmistakable signs were everywhere. The hard and sometimes dangerous job of resort manager, Ricky Chin—always ready to jump on a speedboat to chase away poaching fishermen—was giving welcome results.

But then it became clear a single private operation would not be enough to properly

time visitors. The place was good—but it was getting better. Big fish became the norm—the Giant guitarfish

patrol and manage such a huge area. More was needed.

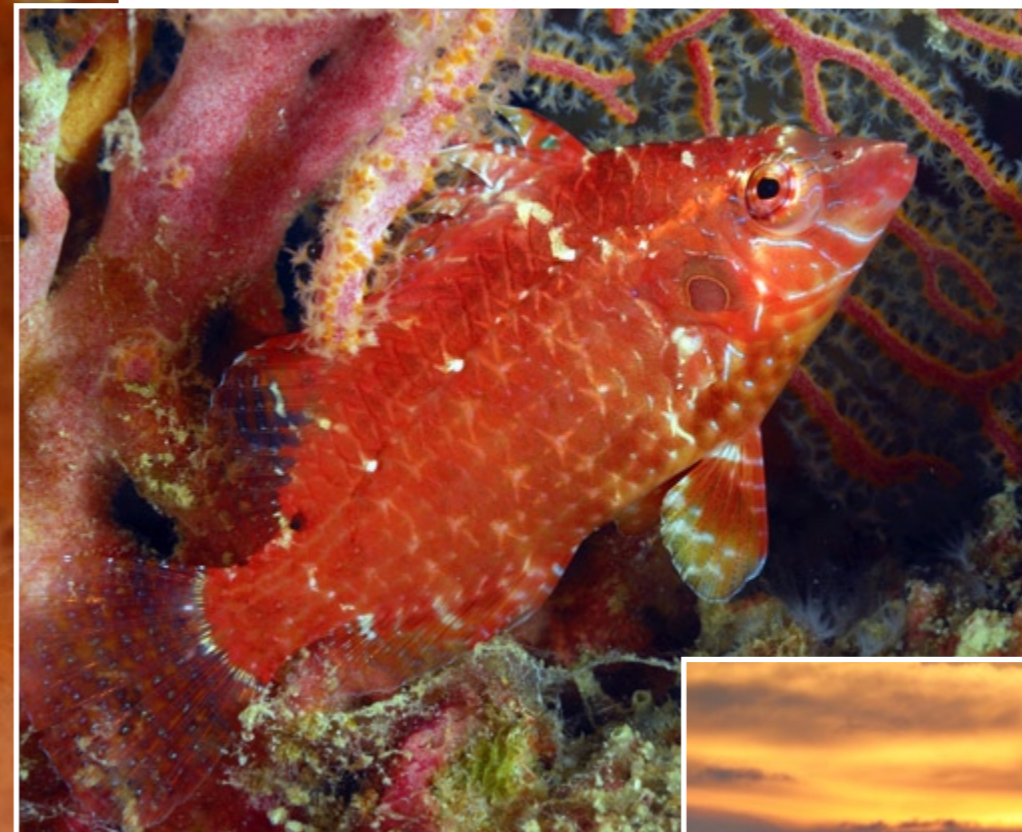
**Reef Guardian**

Enter Reef Guardian, the private company which now works side-by-side with the Malaysian Government and the Wildlife Department of Sabah to manage and conserve the area. A lot of hard work, tireless lobbying and clever political maneuvering succeeded at last in transforming the dream in reality. In 2003, the Marine Protected Area (MCA) of the Sugud Islands was finally officially declared. The playground of a lucky few had become a winning example of ecological conservation through the cooperation between private enterprise and the state.

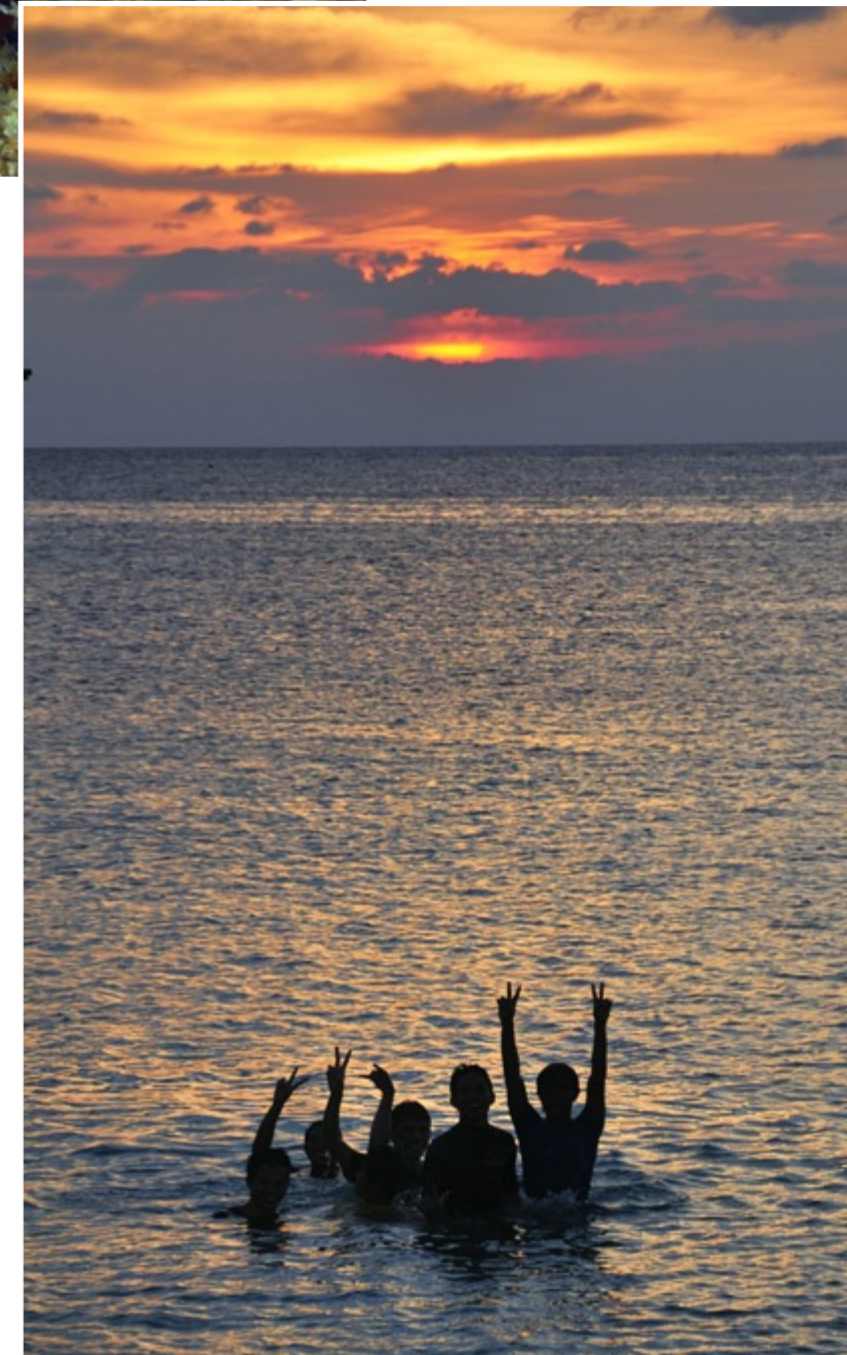
PSR, through its subsidiary, Reef Guardian, protects and conserves the natural resources of the area, reinvesting part of the profits into its management. Patrol boats have been bought and equipped staff members have been employed and well trained. Marine biologists have been invited to conduct surveys and a census of the marine life. New

methods of rubbish and non-solid waste disposal have been developed and researched, to first minimize and then completely





CLOCKWISE FROM FAR LEFT: Hairy squat lobster; Hawkfish and fan coral; Enjoying a sunset swim at Lankayan; Nudibranch *Chromodoris coi*; Aerial view of the island of Lankayan



gile marine ecosystem of Lankayan for us all to enjoy.

The story of Lankayan shows what can be done when an individual with a thinking brain, a clear vision (and admittedly a lot of capital) can do when he sets his mind on eco-tourism and marine environment protection. Its success has recently led to the creation of a second eco-friendly upscale dive resort, this time on the neighboring island of Billean. From what we have seen—it will probably open in 2010—it promises to be even better than the original one on Lankayan.

**Concluding thoughts**

We have travelled and dived the world far and wide, but the story of Pulau Lankayan and the Sugud Islands Marine Conservation Area is still quite unique in our experience.

avoid the seepage of nitrates (the bane of island resorts with no sewer systems) in the surrounding, pristine sea waters.

The huge problem of phosphates coming from oil plantations on the coast and being flooded out to sea —where they lead to plankton and algal blooming, putting the survival of coral colonies at risk—by rains and rivers is going to be tackled soon. And many more steps will surely be taken in the future to preserve, defend and re-habilitate the splendid, fra-

Most dive resort operators are not really willing to embark onto such a far-reaching voyage, being contented to mind their own business, failing to realize the extent of consequences when the local government (and people) are not actively involved.

How many private entrepreneurs have actually succeeded in having the government declare a protected area around their own island or stretch of land? How many tourist and dive operators have actually tried and fought to do so? Protection of

habitats as a whole is the first unavoidable step towards protection of single species, and habitat protection needs lots of money to be implemented correctly. The costs are high, but as the axiom says, “think globally, act locally”.

Patrols must be regularly mounted, staff must be properly trained in field procedures and regularly paid, expensive equipment must be acquired and maintained, research must be done and updated, data must be stored and analyzed.

Without money, there's no protection, and without protection only destruction will follow. The proper management of a successful dive resort and operation such as Lankayan points the way in the right direction. The results are there for all to see. ■

# Sepilok

*In the forest realm  
of the Orang-utan*



Sabah



Text and photos by  
Andrea and Antonella Ferrari

**The biggest mistake one could do while visiting the Sepilok lowland tropical forest would be watching the orang-utans, or rather, watching *only* the orang-utans. That is because this formidable stretch of wilderness—wisely preserved just a few miles from the modern bustle of Sandakan town—offers an unequalled opportunity to observe in comfort the utterly complex mechanisms of nature at work in the tropics.**

big red-haired apes, their extraordinary prowess in tree-climbing and upside-down vine-dangling, and after having been dutifully moved to the depth of the heart by their soulful gaze (no other primate looks at you like an orang-utan does), the visitors should stay a little longer in the forest, to take a leisurely stroll along the well-marked trail in the company of a biologist and guide from the Rehabilitation Center.

It is then, and only then, that one will be able to hear the hypnotic, cycada-like song of the tree frogs, the booming, cackling call of the great hornbill, the soft rustle in the dead leaves on the forest floor at the passing of a bronze skink. Only then, the metallic shine of spider eyes will be apparent; only then, the dead brown little branch will start walking with the hesitant steps of the stick insect; and it is only then, that the bright green leaf buds on a low shrub will suddenly

take the coiled shape of the pit viper waiting in ambush. A little patience will repay the visitor with extraordinary gifts.

And after having experienced the tropical forest in its full complexity, even the orang-utans will appear in a new, full, more complex dimension, encompassing their role in the ecology of the forest and their extremely difficult situation at the present time, when their survival in the wild is severely endangered by logging, mining and general habitat encroachment by human beings. Their's is a complex problem, and one which touches us all: the preservation, not of a single species, but of full habitats is rapidly becoming one of the most important concerns of the new century.

### Where to stay

So, to take the time needed to fully appreciate the ancient rhythms of

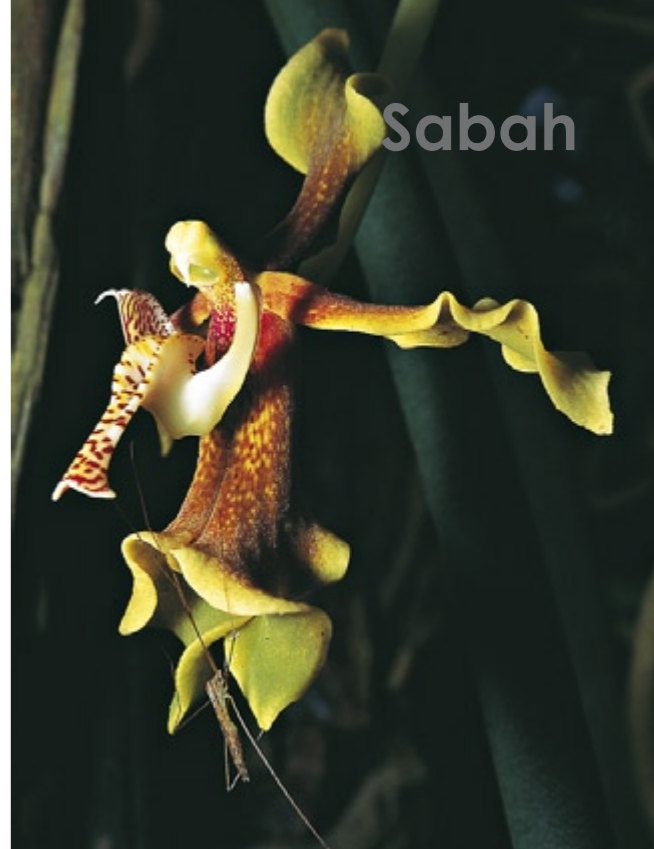
After having admired for as long as needed the delicate grace of the



Sepilok Calotes lizard

THIS PAGE: Orang-utans lounge in the trees of the forest at Sepilok's Rehabilitation Center; Green snake hides among the branches (above)





the forest, the best thing one could do is stay at least a few days at the Sepilok Nature Resort, a most beautiful compound bordering on the protected area (it is actually not uncommon to have orang-utans, macaques or

and grasses and a collection of more than 150 different Asian orchid species. The Orang-Utan Rehabilitation Center (where young captive or abandoned orang-utans are being helped by a highly trained and motivated staff to readjust to a life in the wild) and the actual Sepilok Forest Reserve are just a couple of minutes' walk away, and the Resort staff are happy to organize birding, trekking and river trips to the neighbouring areas (including the fauna-rich Sukau area along the Kinabatangan River).

Before venturing further away, however, one should first take advantage of the comforts offered by the Sepilok Nature Resort and fully explore the natural wonders of the Sepilok-Kabili Forest Reserve, which has enough to offer to keep one busy for months. Here, insects, amphibians, reptiles and birds abound; the trails are very well marked; and the local guides are friendly, reliable and extremely knowledgeable. Visits to Sepilok are also usually combined with dive trips to the beautiful island of Lankayan, which is owned and managed by the same company. ■

even pythons wandering around among the chalets) and perfectly integrated with the surrounding forest.

Set in a spectacularly landscaped private area of manicured lawns, orchid gardens and rolling hills, the fully airconditioned (and very comfortable) twin bed chalets feature beautiful lake or jungle view verandas and private bathrooms with hot water. The surrounding park, which would take half a day to explore, offers an amazing array of tropical plants



CLOCKWISE FROM TOP LEFT: Sepilok Resort restaurant overlooking a jungle lined lake; Orchids of the forest; Brilliant colored beetle found in the forest; Another splendid orchid on the grounds; Sepilok Resort bungalows; Pair of orchids (inset)



# *A trip to Borneo's hidden jewel* Kinabatangan



Text and photos by  
Andrea and Antonella Ferrari

**The lowland riverine forest, encompassing the extensive Kinabatangan river basin and its 26,000-hectare wildlife sanctuary, has few rivals in the world for remoteness, richness of animal species and just sheer natural beauty. At the same time, this spectacular and mostly untouched wilderness of Malaysian Borneo is very accessible and easily explored — usually by small boat during the day or walking by night or late evening.**

Departing from Sandakan harbour, visitors can easily reach the Sanctuary's headquarters in Sukau—where most of the lodges are located—by a scenic

one-hour long boat trip that ends at one of the riverside resorts' pier. More and more guesthouses, jungle camps and fully-fledged forest lodges have been recently popping up along the river's banks, all offering excellent accommodations (of varying level and cost, but

all very clean and very well organized), good standards and very tasty Sabahan food, often using locally acquired, fresh organic products such as delicious vegetables or fruit and big river prawns grown and farmed by the local Orang Sungai (river people). The best way to visit the

Kinabatangan river basin with its enormous, eerily beautiful oxbow lagoons and many small, twisting tributaries is by booking a week-long stay via a specialized wildlife travel agency in Sandakan; service is usually excellent and specific needs of visitors are normally very well

cared for. Regularly subject to tides and periodical inundations during the rainy season, in a perennial state of flux and sparsely populated along its banks by small fishing and farming communities, the Kinabatangan river basin represents a very unique natural environment, pea-





cefully shared by humans and wildlife.

**The Importance of a Good Guide**

The Kinabatangan river basin is a wildlife photographer's dream come true, as most Borneo wildlife is not only richly represented in the area but also often easily sighted and photographed around Sukau, provided one knows where and when to look. This is obviously a destination where the services of an experienced local wildlife guide are a must, especially for those taking their exploring seriously.

We had a stroke of luck and had the time of our lives with Dennis Ikon, a native, self-taught enthusiast who is not only a very experienced rainforest guide but also a passionate wildlife photographer to boost, always ready to recognize a photographer's special need or request without even being asked; he certainly made the difference for us. He has worked many times with big-time, exceedingly demanding pros such as Frans Lanting, so he knows his trade well!

Remember to take with you

a good telephoto (VR-equipped or with a sturdy tripod) for all the big and not so big species you'll observe during the day from the safety your boat, and a good flash, and your macro lens of choice for all the weird and wonderful little critters you'll see at night.

Being in Borneo, a sun hat and a lightweight rain poncho are nice to have around, especially if you plan to spend a lot of time exploring the river by boat. Night walks are safe and easy (leeches are harmless and nothing to worry about), but bring a pair of strong, comfortable jungle or trekking ankle boots and a small torch with you, and be prepared to get very wet and very muddy.

**Where to go & what to do in Sukau**

The average day in Sukau starts just before dawn, with the faraway hok-hok of some distant hornbill welcoming the first warm rays of the sun over the steaming jungle. After a lovely breakfast at the lodge, visitors hurry down the river side jetty to board a small, low aluminum

canoe powered by both petrol and electric engines to start the day's explorations. The boats are lightweight, flat-bottomed and very stable, making an excellent platform for a photographer's tripod – the local boatmen employed by the lodges take great pride and are very good at switching from petrol to electric just at the right time to allow as close an approach to wildlife as humanly possible.

Most exploration takes place at a leisurely pace along the Kinabatangan muddy banks and up its small, meandering tributary, the extraordinarily scenic Menanggol. It's a good idea to book one's accommodation as close as possible to its mouth, as the winding course of the forest-canopied Menanggol is a favourite destination for wildlife enthusiasts and birdwatchers visiting the Kinabatangan area. So, to enjoy it at its most evocative, unpopulated best, it's better



CLOCKWISE: Harlequin gliding frog; Crab-eating macaque; Mouse deer; Wagler's pit viper; Proboscis monkey male on tree trunk; Mangrove snake resting among branches

PREVIOUS PAGE: Pied Hornbill; Visitors exploring the Menanggol tributary, an oxbow lagoon of the Kinabatangan







Sabah

CLOCKWISE FROM INSET BELOW: A flower by the river; Buffy fishing owl at night; Stick insect; Water monitor; Rainforest katydid mimicking a leaf; Large Saltwater or Estuarine crocodile in the Menanggal

offering wonderful opportunities for safe, comfortable and very fruitful night walks.

Even closer to the coast and branching out to the Sulu Sea itself, the immense estuary of the Kinabatangan is clogged in thick, labyrinthine, impenetrable forest of mangroves and Nipa palms—primordially beautiful and rich in species but not easily



explored or, thankfully, exploited. You will have excellent opportunities to admire this unique environment on your way to and from Sukau.

Encroached on all sides by rapidly developing oil palm plantations—the scourge of Borneo's primeval forests—and endangered by logging plantations, which severely curtail the larger animals' migratory routes and forest corridors, the Kinabatangan Wildlife Sanctuary is never-

theless officially considered today to be one of the most important and pristine areas of wilderness in the whole world, and as such, it cannot be missed by wildlife enthusiasts. Floating down its murky, deep, slow-flowing waters is like taking a veritable trip back in time.

**A treasure trove for wildlife lovers**

But what about the animals one can hope to see? Well, we know very few areas outside of the African plains and the Venezuelan Llanos where one can hope to observe and photograph such spectacular amounts of tropical wildlife. Remember always, however...this is South-East Asia—not the Serengeti!

Commonly sighted reptile species here are estuarine or saltwater crocodiles (with some very big individuals occasionally sighted up close), reticulate pythons, mangrove and dog-toothed cat snakes, bright green temple pit vipers and very large water monitors, while among the 250 bird species found in the area one can sight, among others, several species of large hornbills (including the spectacular Rhinoceros hornbill), fish-eagles, buffy owls, kingfishers, cuckoos and darters. Among the large mammals, wild pigs, dwarf Bornean elephants, river otters, leaf monkeys, long-tailed

macaques, wild orangutans and proboscis monkeys are commonly observed, often up close and at length. In fact, the Kinabatangan Wildlife Sanctuary is the best spot anywhere to observe the rare elephant of Borneo, a smallish and friendlier cousin of the Indian one which has recently been awarded its own species status.

This is also the land of flying snakes and flying frogs, while those interested in insects and spiders—often quite large and very colorful—will keep their cameras clicking away, especially if going out

at night and with a warm tropical drizzle shrouding the thick forest. All in all, the Kinabatangan river basin is a treasure trove of rare, endangered and fascinating tropical species, all to be found and often easily observed in a landscape of unrivalled beauty and isolation. As a choice destination for the discerning wildlife photographer and nature enthusiast, it truly has few equals anywhere, and one can only hope its currently protected status will keep it healthy and untouched for many, many more years to come. ■



to get there before anybody else, immediately after sunrise. If you're staying at a lodge close to its mouth you'll also be able to linger around for a longer time in the evening before going back for dinner and your night walk. If you can afford it and are serious about your wildlife photography, go for your own personal guide and boat. It will surely make a difference.

**On foot or by boat**

The thickly forested area around Sukau itself—this is prime virgin lowland dipterocarp country—makes extended exploration on foot rather difficult, but that around the village of Abai—somewhat downriver and closer to the coast and the sea—allows excellent walks on well-maintained forest trails and boardwalks,





# Danum

*The valley where time stands still*



Sabah

Text and photos by  
Andrea and Antonella Ferrari

—A pristine, virgin rainforest

**The crown jewel of the untouched nature of Borneo, the legendary Danum Valley Conservation Area is the largest protected lowland dipterocarp primary forest in Sabah, Malaysia. This pristine, untouched area of extraordinary beauty holds an unique status among other protected areas. Before it became a conservation area, there were no human settlements within the area, meaning that hunting, logging and other human interference was non-existent.**

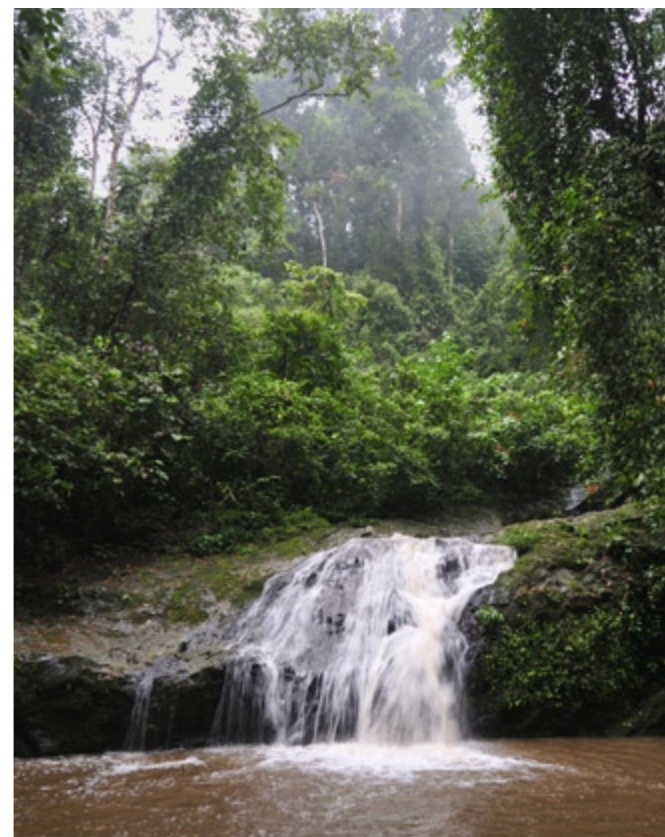
This makes the area one-of-a-kind among other protected areas in Sabah—evidenced at first glance by both the number of animal sightings and the sheer scope of its water-soaked, luxuriant rainforest. Danum Valley covers an area of 438 square kilometres and is currently managed by the Yayasan Sabah

Foundation, created in 1966 for conservation, research, education and physical training purposes. The nearest town, Lahad Datu—a quiet, smallish settlement at the crossroads between Sandakan and Tawau, which can be easily reached by car or twin-engine turboprop flight from both centers—is about 82km away (about a two-hour drive by four-wheel drive vehicles on mainly unpaved washboard logging roads in good weather, but be prepared for a much longer Camel Trophy-style slog if it has been raining!).

Given its formidable isolation and impenetrable rainforest cover, accommodation in the area is presently limited to two basic choices: the Danum Valley Field Centre, a research establishment reserved for scientists and education purposes only; while the other, rather splendid (and understandably rather expensive) Borneo Rainforest Lodge, has been created with conservation and low-environmental impact in mind for tourists to stay. From its beautiful, well-appointed chalets, visitors can take long, guided walks through lowland rainforest trails, while other activities include night walks (serious wildlife photographers should not miss these) and night drives (avoid these, which are crowded, noisy and not really suited to the local environment—rainforests are made for walking).

Visitors on the extensive rainforest canopy walk (above) and a view of the untouched primary Danum jungle (top right)





CLOCKWISE: Silver leaf monkey feeding at dawn; Perfectly camouflaged Borneo horned frog; A waterfall in the forest; Forest dragon lizard (male) on its perch; Jade tree frogs mating on a rainy night; A colorful Lantern bug (inset)

**Fauna & flora with few equals**

Danum Valley is a world-famous destination for passionate birdwatchers, but its undisturbed, virgin, thick lowland rainforest is home to many other animals including several large mammals, many beautiful reptiles and amphibians, and countless numbers of exceptionally attractive insects.

Mammals regularly sighted include wild Orangutans, gibbons, leaf monkeys, long-tailed and pig-tail macaques, wild bearded pigs, mouse deer and sambar deer. Lucky visitors may also occasionally encounter several species of wild cats (including the "dream date" of South-East Asian rainforests, the strikingly beautiful and incredibly elusive Clouded Leopard), the shy Bornean Pygmy elephant—which is much more easily observed, however, along the Kinabatangan river basin in the Sukau area—and even Malay Sun bears or Sumatran rhinos (but do not count on the latter!).

Birds commonly observed number several species of Hornbills (including Rhinoceros and Helmeted), bee-eaters, kingfishers, warblers, several species of forest raptors and many others too numerous to mention here, while among the many reptile and amphibian species encountered the impressive Reticulate python, at least two different species of Pit viper, the strikingly marked Paradise snake, the colorful Forest dragon lizard and the amazingly well-camouflaged Borneo horned frog all deserve to be mentioned.

A lot of first-time visitors to rainforests spend most of their time looking in the distance and hoping for the large animals, but the most interesting and fascinating denizens of this mysteriously beautiful environment are in fact the small, secretive, camouflaged inhabitants of the forest floor and canopy: diminutive reptiles,

amphibians and most often strange insects of all shapes and sizes, which are usually quite hard to spot and which are most easily observed during the guided night walks.

**Rainforest Trekking**

Long day and night walks are the best options to fully appreciate the Danum Valley rainforest environment. Despite the apparent drawbacks and discomforts—waking up at 5am, slogging in the mud for hours on end, being literally drenched in sweat and very often even rainfall,



dealing with the occasional but messy leech bite—this is really the only sensible way to enjoy the place and fully savour the wonders it offers. Get yourself a private guide



LEFT TO RIGHT: A Red-phase Silver monkey feeding in forest canopy. Giant stick insect; Giant Rhinoceros beetle on tree trunk; Harlequin gliding frog

Most important of all, take a pair of good hiking ankle boots along. This is where synthetic, breathable fabrics such as Cordura are strongly recommended, since they'll be constantly soaked, and boots in natural materials such as leather or canvas would rapidly rot or mould, often in a single night's time. A sun hat and a rainproof torch will be important

items to take along, too. Since we're on the subject, do not let the local all-pervasive obsession and paranoia with leeches scare you—these fascinating, small rubbery creatures (did you know they can survive with a single feeding a year if needed?) are completely harmless and do not transmit any diseases. If you get bitten by one you'll feel no pain—maybe a little itching later on—but you'll certainly bleed freely and massively for quite a few hours, as their saliva contains both an efficient anesthetic and a powerful anticoagulant. The blood staining and trickling can look scary to the uninitiated, but it's no big deal, really. After a day's trekking in the rainforest you'd have to thoroughly wash your soiled clothes anyway! On the good side, Danum Valley is almost completely mosquito-free, and that is really important since most serious tropical

diseases, such as malaria or dengue, are transmitted via the bite of these obnoxious little winged pests.

**Impressive environment**

Despite our lifelong experience in rainforests exploration and photography worldwide, we could not help being deeply impressed, and in fact, even awed by the beauty, richness and sheer isolation of Danum Valley. This is a virgin, primordial, occasionally demanding environment of steaming lush vegetation and glutinous ankle-deep mud, of steep ravines and gurgling clear forest brooks, of gigantic buttress trees and coiled, climbing lianas, perennially bathed in oppressive heat and humidity. Incredibly violent downpours are sudden and frequent, and even when bathed in searing sunshine the whole environment is perennially immersed in a prehistoric, Jurassic Park-like atmosphere.

Animal sightings are surprisingly frequent and near for a rainforest habitat, and photographic opportunities for professionals and serious amateurs are simply

enormous. We spent a whole week at the Borneo Rainforest Lodge, and we feel we have barely scratched the surface. Every few steps along the forest trails a new fascinating subject would be sighted, and it would not be uncommon for us to walk a few hundred meters only, in more than three hours, especially at night.

To the attentive, careful observer and thanks to its own specific nature, the Danum Valley environment offers an unique chance—the possibility not only to sight wild animals, but to pause at length and leisure and watch them actually behave i.e. feed, hunt, mate. This is a rare and precious gift, one which has to be treasured, and Danum offers it generously to those willing to listen to the sounds of the forests or put their eyesight to good use. Add to this the deeply moving, emotional impact of the untouched rainforest habitat and the creature comforts offered, at the end of a tiring day, by the beautiful Borneo Rainforest Lodge. Whoever thought up the open-air bathtubs on the wooden chalet balconies facing the rainforest and the river was a genius. You will understand why we have fallen in love with Danum Valley, and why we cannot wait to go back there—this time, for a longer stay! ■

from the Borneo Rainforest Lodge if at all possible—as everywhere else it will make the experience completely different—and bring cotton clothes only (no artificial fibers!), with long trousers, long thick socks to tuck them into, and long-sleeved shirts. Be aware that you'll be drenched most of time in your own sweat and/or rainfall—so it makes no sense trying to keep dry at all costs with nylon ponchos or raincoats, which also rapidly become unbearably suffocating in the heat.



View from the bathtub-equipped balcony of the exclusive Borneo Rainforest Lodge overlooking the Danum River



silver



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*Revisited*  
**Sipadan**



One of the ubiquitous green turtles taking a good snooze on the reef of Sipadan Island. PREVIOUS PAGE: Diver and cloud of trevally

Text and photos by Peter Symes and Tim Hochgrebe

**I've always been both somewhat envious and intrigued by what Sabah, Malaysian's easternmost state have to offer the travelling visitor. Great diving of course, but the richness and diversity of the abundant top-side natural resources such as rainforest and mountain ranges, history and the cultural diversity is something that few regions can match.**

The list of sightseeing attractions and activities seem inexhaustible. Aply named "the land below the wind" not only because it is bypassed by the devastating typhoons that occasionally ravage other tropical paradises, but also because, for modern fast-paced executives, it is a soothing escape from the big city hustle and bustle.

Upon arrival, the provincial tranquility and smaller scale of things in Sabah instills a sense of coming to a safe and calm place, which seems to go about matters in its own time and direction, unperturbed by unrest elsewhere on the globe. And Sabah has indeed come a long way in a short period of time, if the few glimpses these undersigned passers-

by get from a airport transfers, hotel stays and excursions is anything to go by.

This time, we arrived at a new airport in Tawau—arriving at the old airport did feel like touching down on a couple of tennis courts—and the roads here are now in a much better state. Modern suburban residential complexes are gradually replacing the ramshackle shantytown of many areas we passed by. Malaysia is only 52 years old as a nation, but the determination with which they build their society never ceases to impress me, and returning here after so many years made the many changes stand out... but were they all for the better?

We were greeted in Tawau airport by Clement Lee, CEO of Borneo Divers and

Divers and schooling barracuda at Sipadan Island

PETER SYMES

Tomato grouper peeks out. They are usually solitary



Mantis shrimps, which aren't shrimps, are aggressive and typically solitary sea creatures, spend most of their time hiding in rock formations in which they either wait for prey to chance upon them or, unlike most crustaceans, actually hunt, chase and kill living prey. Mantis shrimp sport powerful claws that they use to attack and kill prey by spearing, stunning or dismemberment

tions 25 years ago.

During most of our 50-minute transfer to Sandakan, we drove by seemingly endless stretches of oil palm plantations, which seem to have pushed the rain-forest back into the distant horizon. Sandakan, once a sleepy fishing village and our point of departure for the boat transfer to Mabul, now seems like a bustling town.

As we enjoyed a smooth ride in a high speed boat skimming across the surface of the sea, I couldn't help pondering how life must be like living in some of the rickety huts on stilts we passed—which have no fresh water or sanitation, let alone electricity—sitting way out there on the horizon in the middle of what seemed to be the open ocean, but must have been

built on extensive mud flats and sand-bars.

## Diving

The range of options on offer within a short radius from Mabul Island is second

to none. Sipadan Island, considered by many to be the best dive site on the planet, is but a short boat transfer away to the south. Mabul itself is one of the birth-places of muck-diving, and with Kapalai nearby, there's also unparalleled macro-diving. Plus, close to the mainland, you can dive in the mangroves.

But even with this diversity, it is probably safe to say that Sipadan remains the coveted star attraction, which pulls visitors from far and wide.

As such, the island has been and remains the centre of much controversy. It was the center of a lengthy battle between Indonesia and Malaysia, who vied for sovereignty over the island at the international court in Hague, which only in 2002, ruled in favour of Malaysia.

As the island's ecosystem is fragile, the many concerns over the impact of tourism later led to clearing the island of the

resort facilities there. Tight regulations were imposed on the number of permitted day visitors, the management of which still remains a very contentious issue between the operators who are all vying for a number of guest permits that is woefully short of the growing demand.

What I have seen over the years there leaves no doubt in my mind that these measures were necessary. Sipadan seems to be in a much better state now than it

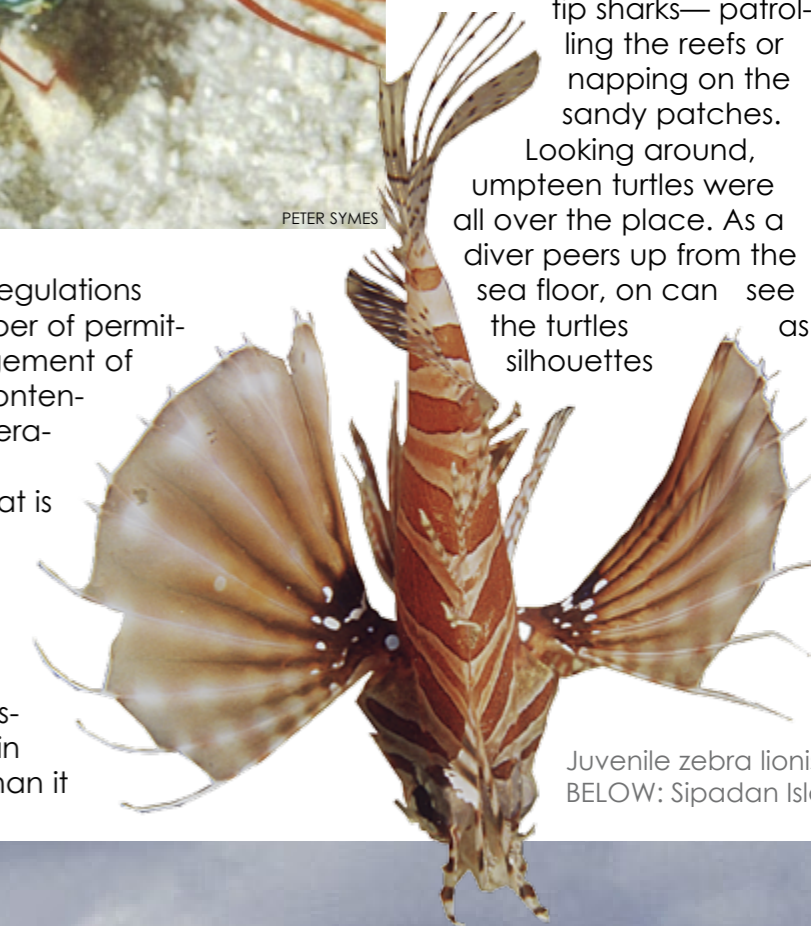
was in my previous visit.

Every day we saw massive schools of barracudas, trevalies and even humphead parrotfish. There were always many small sharks—predominantly the ubiquitous white tip sharks—patrolling the reefs or napping on the sandy patches.

Looking around, umpteen turtles were all over the place. As a diver peers up from the sea floor, one can see the turtles as silhouettes



PETER SYMES



Juvenile zebra lionfish  
BELOW: Sipadan Island

PETER SYMES

PETER SYMES



PETER SYMES





PETER SYMES



Butterflyfish were everywhere

TIM HOCHGREBE

against the water's surface gliding gracefully along the reefs like soaring birds in the sky eclipsing the sun, or plainly snoozing in some crevice on the reef like hung-over teenagers on Sunday morning, totally unaffected by all the wheezing, bubbling visitors closing in to take snapshots with their underwater cameras.

There are about 13 dive sites around Sipadan. When the ocean is calm, it takes about 20 minutes to get from Mabul to Sipadan. Most of the diving in Sipadan is a combination of wall and drift diving. The visibility was never really great during the week we spent there—partly due to a couple of days of choppy seas that stirred up particles—but because there was always so much to see, we never really noticed, or least, it never became a concern.

As the day guest permit system worked during our visit, the defining measure of the permit was 'a day' not the number of dives permitted. Consequently, the excursions to Sipadan were conducted as full day outings with four dives and a lunch break in the middle.

At times, I felt that this regime was a little too rigorous, as the fourth dive in a day often was of limited quality and use, among other things, since



TIM HOCHGREBE

Plenty of grey sharks were patrolling the drop offs along Sipadan

one had been building up nitrogen over the day, and so, there were decompression issues to consider. But hey, it's a bit like complaining about being fed too much caviar and champagne. Sipadan is one of those blessed places where you seemingly can't have a bad time even if you try.

Here, disappointment is if you only see a small school of fish and a couple of sea turtles.

Because of its relatively small size and it having dive sites all the way around its perimeter, it is always possible to find a sheltered spot on the leeward side

on a windy day. One of my personal favourites remains Barracuda Point. I know, it has been covered ad nauseam in so many publications before—including this one—but it is not without merit. Here, you always seem to be able to find a huge school of circling barracudas



PETER SYMES



TIM HOCHGREBE

LEFT: Juvenile spotted sweetlips takes cover. FAR LEFT: The mangrove forests just off Semporna offers a completely different yet underappreciated habitat

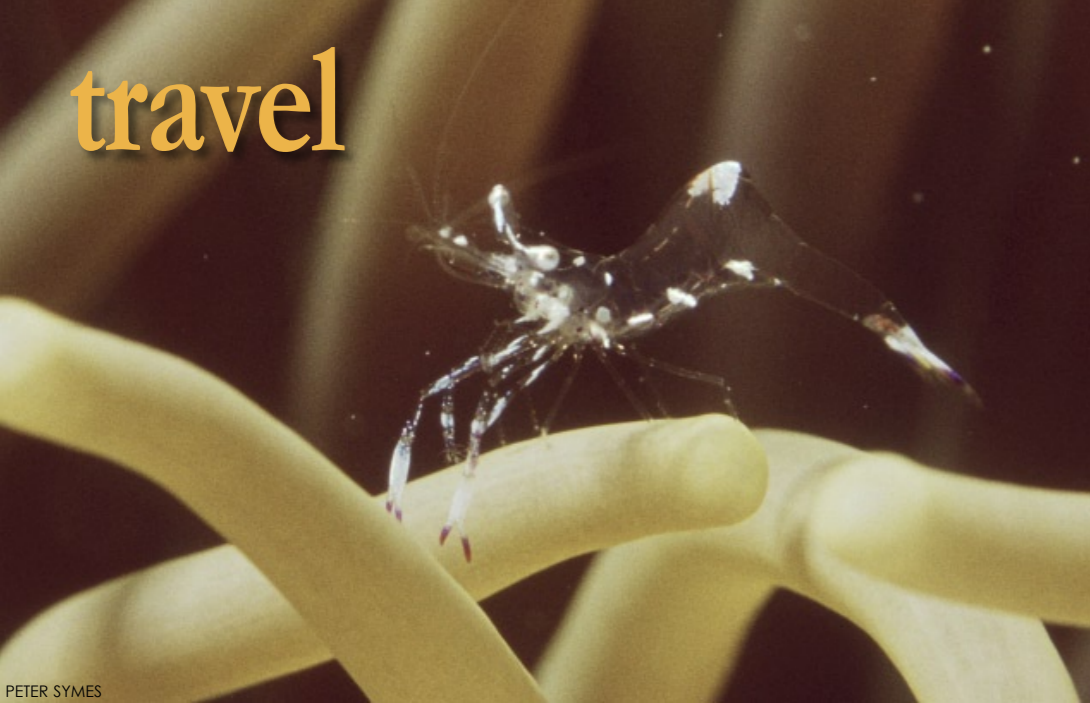


PETER SYMES



PETER SYMES

ABOVE: At the aptly named Barracuda Point, giant schools of barracudas never let us down  
LEFT: A juvenile scorpionfish, perhaps Poss's Scorpionfish, blending into the sand  
FAR LEFT: One of the species I never tire of seeing; the ornate Ghost Pipefish



A tiny translucent coral shrimp of the Periclemens species

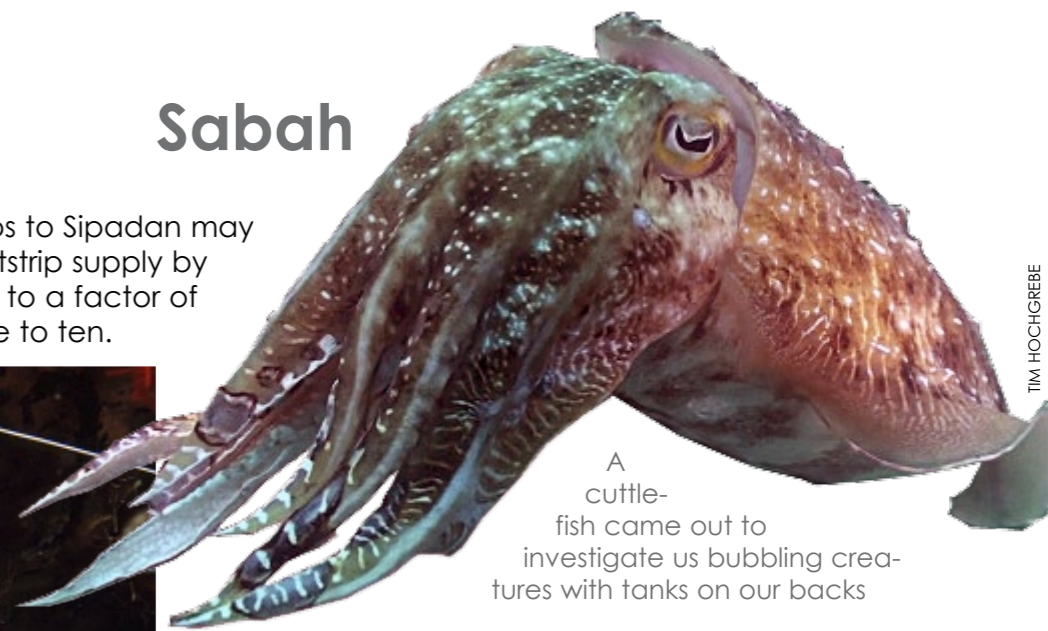
a snack at the gazebo, which is built on the island. It is also here we have lunch after the second dive. The authorities have also built a proper toilet facility on the island. Fresh water is supplied by boat every day and pumped ashore—a reassuring sign that the facilities aren't drawing on the small aquifer under the island.

Aside from the area around jetty, the gazebo and the toilet facilities, the rest of the island is now off limits for visitors, though there is a residing contingent of soldiers and park

rangers overseeing and enforcing the protection measures, including keeping fishermen and poachers off the island.

trips to Sipadan may outstrip supply by up to a factor of five to ten.

Sabah



TIM HOCHGREBE

A cuttlefish came out to investigate us bubbling creatures with tanks on our backs

During peak periods, vacationers who may come from afar could, in a worse case scenario, end up finding themselves going to Sipadan only once. Curbing the number of visitors to Sipadan has been essential to protect the fragile island from being unsustainably exploited—let there be no doubt about that—but the way the permit system is currently set up leaves room for

fourth consecutive dive often ends up being so and so, if you are not the type who's itching for having yet another dive logged in the book. Why not make it 2 x 240 half day permits, so twice as many may have a chance of going? The load on the island will be the same, or even less, as half day visitors will probably not have their lunch there.

In any case, when booking a trip to the area, pay close attention to the regulations and advice given on the various home pages and ask how many dives to Sipadan can be pre-booked or guaranteed.

There is also an interesting but almost perverse twist to the arrangement as well: many of the resorts are allotted the same number of day permits, just 14. So if you go for the big upscale resort accommodating up to 100 guests, which may be well booked, you could end up having far worse odds of going to

Sipadan than if you stay with



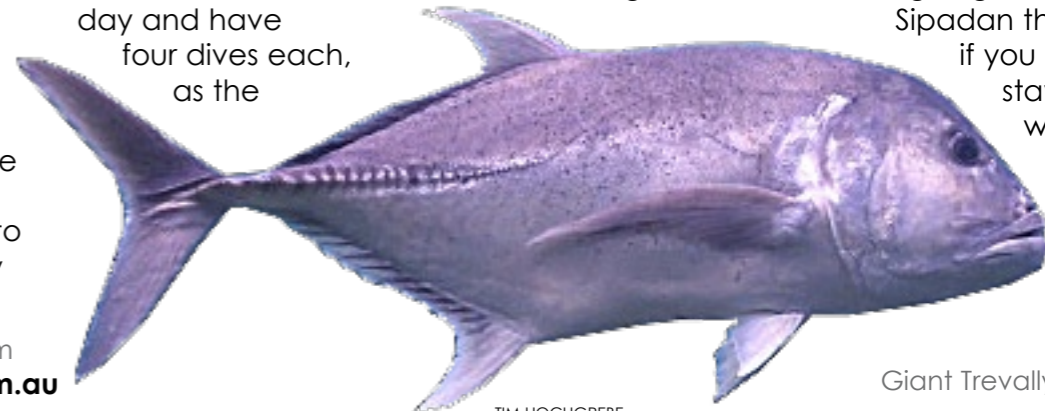
PETER SYMES

Wax and polish, Sir? Honeycomb Moray Eel at a cleaning station enjoys the services of attending hinge-beak shrimp, giving it the royal treatment while bar-gill cardinalfish seem to be looking on with envy

Permit controversy

As this issue goes to press, the current system of day permits allows for 120 day visitors—no overnight stays are allowed anymore. With about 15 resorts each accommodating some 30-100 guests, many of which have come here to dive Sipadan in particular, it doesn't take a rocket scientist to figure out that demand for day

further improvement. What springs to mind is whether each granted visitor really needs or want to go there for the full day and have four dives each, as the



Giant Trevally

TIM HOCHGREBE

Our good friend and colleague Tim Hochgrebe from [Underwater.com.au](http://Underwater.com.au) lives out his inner paparazzi

or trevallies, which, if you move carefully, can end up completely encircling you. I get such of kick out of this—flying in formation inside a huge school of fish as if I am one of them. It always ends

too soon, and like a five-year-old in an amusement park, I am always left wanting more when time is up.

Between dives, the boat goes back to the jetty, and we have



PETER SYMES



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COUNTERCLOCKWISE FROM ABOVE: Humphead parrotfish are best encountered in the mornings; Scorpionfish are masters of camouflage; Batfish are found everywhere; A couple of yellow shrimp gobies peek out of the burrow in the coral gravel. They usually share their burrow with one or more alpheid shrimp; Sipadan Island park ranger feeds the neighborhood lizard



PETER SYMES

crocodile fish and plenty of groupers. That was quite a parade.

Around these parts there is rarely a need to move far and most likely you will find yourself covering an area no bigger than the size of a tennis court during a typical dive. Most of your time will probably be spent kneeling on a patch of sand in front of a coral block observing the myriad of small

and big sea life going about their daily business.

tion all day long and dive at your leisure. Once upon a time, while staying at Sipadan Water Village, I spotted my very first ghost pipefish right under their jetty.

The reef slopes down at about 45 degrees just off the jetty before it levels off into the sandy plateau surrounding the island at around 18m. The southern side of Mabul is fringed by a large sandy plateau, and the dive sites here are only reached by a short boat ride.

### Diving Kapalai

It is not really an island but a sandbar. If not for the resort balancing on its stilts on top of the shoal, one wouldn't know it was there except during low tide. Like Mabul, this location is full of small critters: nudibranchs, gobies, crabs and what not. A once resident biologist explained that these islands, which offers sheltered shallow bays, act as nurseries for a wide range of species.

There's mostly sandy bottom, or coarse coral gravel, with only few coral heads. At first sight, it comes across very unassuming—that is, until you catch a glimpse of your first blue ringed octopus, frogfish or ghost pipefish.

Kapalai is a little bit further

away from Sipadan than Mabul, but still within easy reach and the muck dive sites around the resort are excellent. A number of artificial reefs have been established around the sand banks of Kapalai including a few ship-



Perhaps it is no wonder this fellah on Sipadan has gotten so potbellied



PETER SYMES

the small economy-range resort, which can accommodate only 25 guests.

### Diving Mabul

There are about 17 dive sites off Mabul and about 13 dive sites off Kapalai. Most of the dive sites can be reached from any of the resorts in less than 15 minutes by

dive boat. Most of the diving off Mabul and Kapalai is quite shallow with depths usually ranging from 5 to 20 meters (15 to 60 feet).

These places are macro heaven on earth. In fact, most of the house reefs are excellent, so you can often pretty much just base yourself at the resort's dive sta-

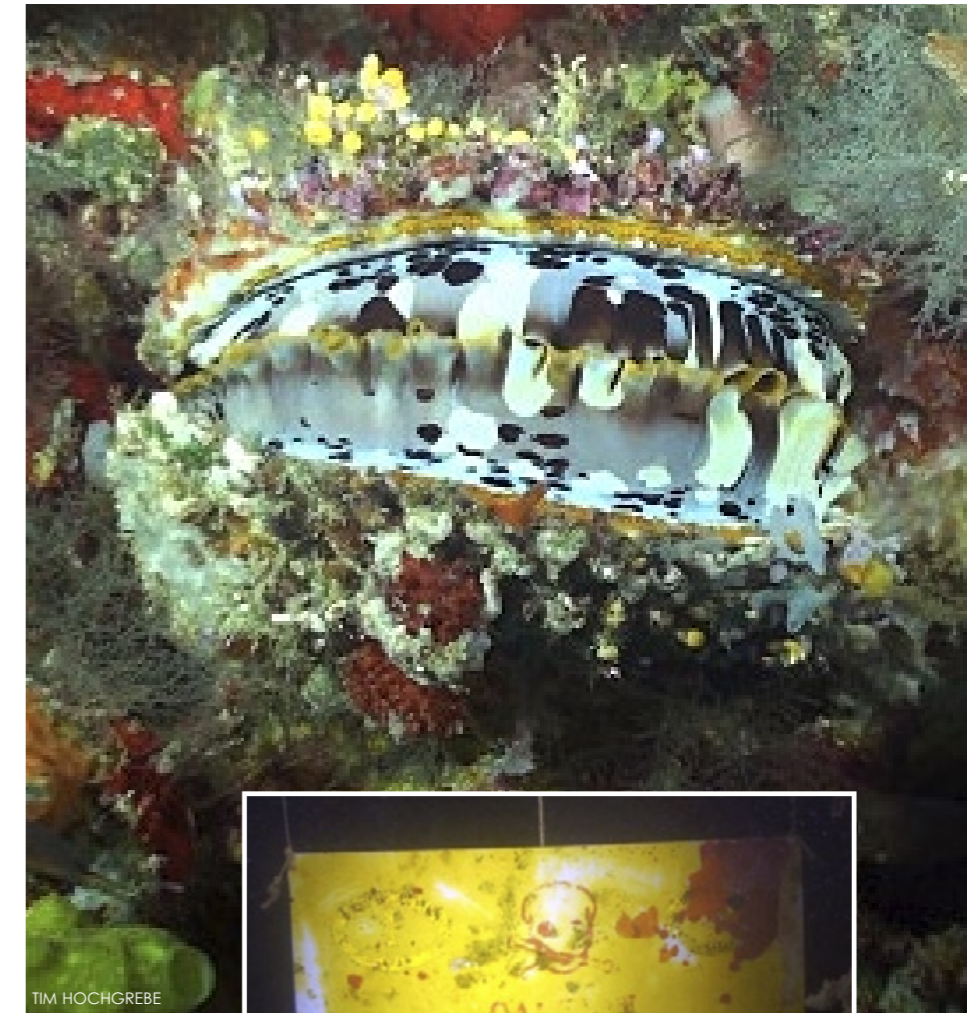


TIM HOCHGREBE



TIM HOCHGREBE

Another pretty nudibranch below the resort of Kapalai (far left); Cuttlefish scooting around on the housereef (left); Decorated scallop shows its eyes (below)



TIM HOCHGREBE



TIM HOCHGREBE



TIM HOCHGREBE

Spearing Mantis Shrimp (above) ready to attack; Chromodoris nudibranch (left)



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A turtle skeleton (above) lays inside the turtle cavern; The remains of a dolphin rests on a ledge inside the cavern (top) Warning at the entrance of turtle cavern (inset)



TIM HOCHGREBE

towards the end of the day, mandarinfish can be seen performing their mating dances just below the water's surface. Unfortunately, the Flamboyant Cuttlefish did not want to show itself to me, which just means there has to be a revisit of this area in the not too distant future.

**Development of Mabul**

Revisiting the island, it was clear that the place has undergone a marked development with the resorts now having a bigger presence. They now dominate the outline of the island. As in so many other places, progress can be both good and bad.

From a tourist's viewpoint, we felt that the

addition of several other resorts, which protrude out from the island, has caused the place to lose a bit of its magic and its sense of luxurious remoteness, which was part of the island's ambience before. And in this regard, whomever is the responsible authority overseeing the local development should fare very cautiously in regards to permitting further construction on the island. The island is still a paradise to visit but with more visitors it would become too busy—who wants to travel half way around the world to have a view of other tourists? This was a sentiment that was also reflected by several of the operators and staff we spoke to during our stay.

Being the investigative journalists that we are, we also wanted to know what effect



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wrecks and what seems to be an old communications tower. The reefs around Kapalai are generally very shallow, but there is some excellent diving, especially if you are into hunting for the more elusive critters; Yawfish with eggs in their mouths, spearing mantis shrimps, big cuttlefish and some excellent nudibranch action. At Mandarin Valley







Sipadan Water Village has also expanded over the years. CENTER: Borneo Divers Bunglaw

## Sabah

reef table, so you can look right down at fish and what not. It has a special feeling. As some of the chalets face towards the island, ask if any of the oceanside bungalows are available. That is, if you're the type who likes day-dreaming while gazing out oot the open ocean.

The resort has now grown to 45 chalets built in the local style.

with lockers, showers, toilet and a common area for resting between dives with complimentary snacks, hot coffee and tea. And from this year onwards, you can also go kayaking in transparent rental kayaks.

### Kapalai

Kapalai is probably the most luxurious of the available accommodation options we have visited around Sipadan. Once a vegetated tropical island, Kapalai is now no more than a sand bar with a resort built on top. So, if you



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tourism had on the local community and how the villagers took the presence of the resorts and all the guests on the island. Many stated that the number of new jobs in the hospitality and construction sectors provided them with good livelihoods. As it turned out, many of the resort staff were recruited from the island. Walking around on the island, the locals seemed very friendly and welcoming, with a lot of goofy kids happily posing for photographs.

### Accommodation

Here are descriptions of six of the 11 resorts found on Mabul Island.

#### Borneo Divers

The resort sits on the island itself in contrast to some of the other nearby resorts that are constructed as water villages with bungalows on stilts over the water. With 30 bungalows, which are now all *deluxe* and arranged around a garden with a pool, the resort is very comfortable and luxurious in a low-profile manner, much like

a discrete limousine. It is an all-inclusive resort, which means that all meals and diving is included. Alcohol and indulgences, such as the awesome massages we got addicted to, are extras. Meals are served buffet style with cuisine including both Eastern and Western fare, so each meal satisfies most pallets.

The diving station sits at the end of the jetty, and from here, there is direct access to a splendid house reef. There is also a little coffee bar, so one can easily spend all day just hanging out on the pier. There is also a room for photographers with tables and recharging stations. For boat dives, you sign up on the planning board, after which the staff will bring your kit to the boat and mount your kit on a tank.

#### Sipadan Water Village (SWV)

SWV was the first water village resort on the island. Guests reside in comfortable chalets with patios that not only overlook the open ocean, but also sit right on the



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The chalets have large slide doors that open onto a spacious outside deck. Meals served in buffet style featuring a mixture of local and continental cuisine are served thee times a day in an open air restaurant with a seating capacity of 150 people at one time.

The dive centre opens from 7:00 am onwards and is equipped

like to feel the sand beneath your feet when staying on a remote tropical island, this might not be for you. However, the resort features luxurious rooms with fantastic views over clean blue water, and for most people, staying in a water resort is a very special and exciting experience. Of course, one of the additional advantages of a resort in the middle of the



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Traditional dancers perform a wedding dance unique to Mabul village; Entrance to Borneo Divers lounge and restaurant

ocean is that it is safe from mosquitos, and you can leave your doors and windows wide open.

#### Seaventures

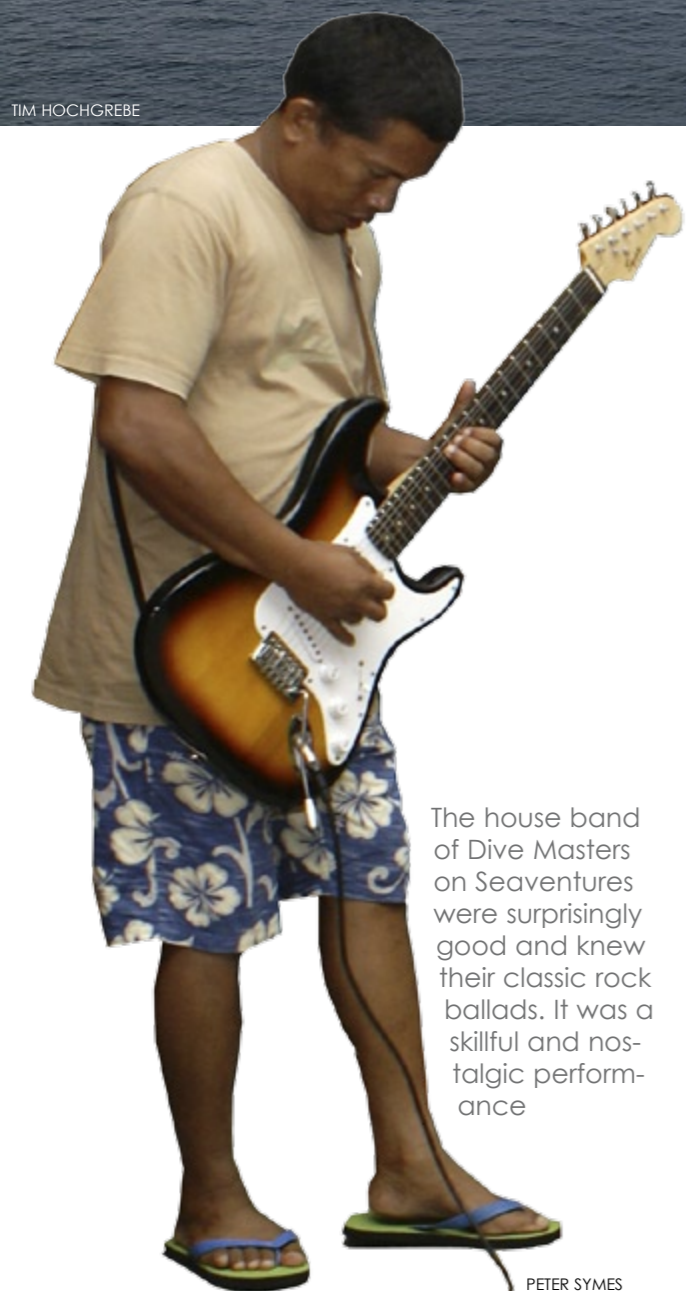
If money is tight, you might consider Seaventures—a small former drilling platform that now sits on

stilts off the northern coastline of Mabul. The industrial construction is a bit of an eyesore, which one tries not to notice when enjoying the otherwise pristine view from Mabul over Borneo.

Going over there was an intriguing experience through. For one,



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The house band of Dive Masters on Seaventures were surprisingly good and knew their classic rock ballads. It was a skillful and nostalgic performance



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Seaventures is the most economical of the resorts visited

the elevator that takes one up to the main platform is also used to lower divers all the way down until they are chest-high in the water. We were having drinks on the platform when two divers went for a night dive under the platform and just took the lift down into pitch darkness and disappeared.

The platform is spacious and has plenty of rooms for various activities. The cabins are... well, cabins, and not really hotel rooms, which makes you feel like you are overnighing on a moored vessel—a feeling enhanced by the fuel smells, one usually finds on ships and ferries, wafting through the corridors.

It definitely came across as a place predominantly for the younger (and probably less affluent) crowd who prefer to pay less for a fun and festive, unconventional time, rather than spend lots of money on upscale décor. There was a party and lots of laughter going on the deck. Then, as a surprise, the house rock band of dive masters set up their gear to play.

Admittedly, my first and spontaneous thought was, "Uh oh, this is going to be

Seaventures 's platform sits a couple of hundred meters off Mabul

## Sabah

painful," but I was soon forced to eat my own words. They were really good, and I thoroughly enjoyed their performance of skillfully improvised classic rock ballads and lyrical classics. The various vocalists had good voices, the drummer was an artist with his sticks, and the guitarist could jam like there was no tomorrow. In fact, I wasn't

ready to go, when our boat came to take us back to our residence on Mabul. I had a great evening, but the accommodation was not really to my liking.

Under the platform is an artificial reef, which is now one of listed dive sites around Mabul. Part of it is really just some old junk upon which a lot of marine life has taken up residence,

but various other constructed structures have been added to create a little park under and around the platform.

### Sipadan-Mabul Resort (SMART) & The Mabul Water Bungalows

These resorts are really two complexes under the same management. There is the *old* complex, SMART, which sits under the shady palms on the southern side of the island overlooking a wide sandy beach, and the new and upscale Mabul Water Bungalows complex, which sits out on the reef opposite and adjacent to SWV. The two complexes are interconnected by a winding pathway upon which an electrical vehicle (like a golf cart) offers transports for stroll-weary Westerners.

The interiors of the 14 bungalows of The Mabul Water Bungalows—each of



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The strangest thing.... divers going down with the elevator straight into the water for a night dive under Seaventures platform



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Mabul Water Bungalow is a new floating dive resort wholly owned by Sipadan-Mabul Resort, Sabah (SMART)

which comes with private bathroom-hot/cold shower and toilet, spacious private balcony offering panoramic vistas of blue sea, colour TV with satellite channels, and mini bar—are luxuri-

ous and opulent. The resort also has an elegant upscale spa. There is an inhouse photo facility, and the large and airy restaurant for dining looks directly out over the reef ledge. As with the other



*"I don't want to see another turtle" — Sipadan diver  
There are so many sea turtles now, they bump into you*

CLOCKWISE FROM ABOVE: The seas and reefs around Sipadan and Mabul islands are a paradise for sea turtles; Local support is enthusiastic as Sipadan Island is recognized as a contestant in the competition to become one of the seven underwater wonders of the world; Fresh water is now being brought to Sipadan by boat thus protecting its fragile aquifer from overuse



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resorts of Mabul, there is an excellent house reef right in front of the complex.

The SMART resort consists of 45 wooden duplex chalets with each room featuring two oversized single beds, a couch, shelves, ceiling fan and air-conditioning,

a private en-suite offering free-flowing hot and cold fresh water and a front patio. The SMART resort is clearly more economical than The Mabul Water Bungalows—which is reflected in their respective rates. SMART is more middle of the road. It doesn't provide quite the same level of luxury, but it is cool and comfortable. In addition, SMART also offers technical diving with basic nitrox mixes up to 40 percent, as well as advanced decompression and rebreather mixes up to 100 percent oxygen.

**The future**

Essential steps have been taken to pro-

tect Sipadan—which clearly looks a bit better since our last visit—though the present permit quota system has its drawbacks and probably could be improved. Mabul is still a romantic get-away, but we were also left a bit sentimental, missing the former aura of remote exclusivity it once had. Any further addition to the number of resorts on the island would be one too many and topple the island's native flavor. It would become something of a Riviera with a village added—which would be an absolute shame. Fortunately, the locals are aware of it.

**Verdict and recommendations**

Sabah has got something for every-one. Over the years, it seems to have developed from something of a frontier where you only went with an avid dive buddy to a place where you can also bring your family—or just have a romantic get-away for two. There are not really facilities for smaller children on Mabul, but as

long as they are content with playing in the pool, or on the beach, and enjoy a relaxed holiday, they will be fine. The diving ranges from snorkelling to technical diving, though it would be a stretch to call it a technical dive destination per se. It seems fair to say that there are a couple of opportunities to do technical diving through the SMART resort.

The main feature is definitely the underwater realm in the form of the amazing congregations of life around Sipadan as well as the seemingly inexhaustible amounts of macro-life virtually at the doorstep of your bungalow. The resorts hold high standards, and the food is good. Diving aside, it would be a shame not to underline the rich variety of topside features from the jungle to the mountains as

well as the diverse cultural attractions. And don't forget, the cities and towns of Malaysia offer great shopping opportunities, especially if your visit coincides with their annual grand sale. Consider packing your suitcases only half full to save room for goodies. ■



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# Why do barracudas form schools?

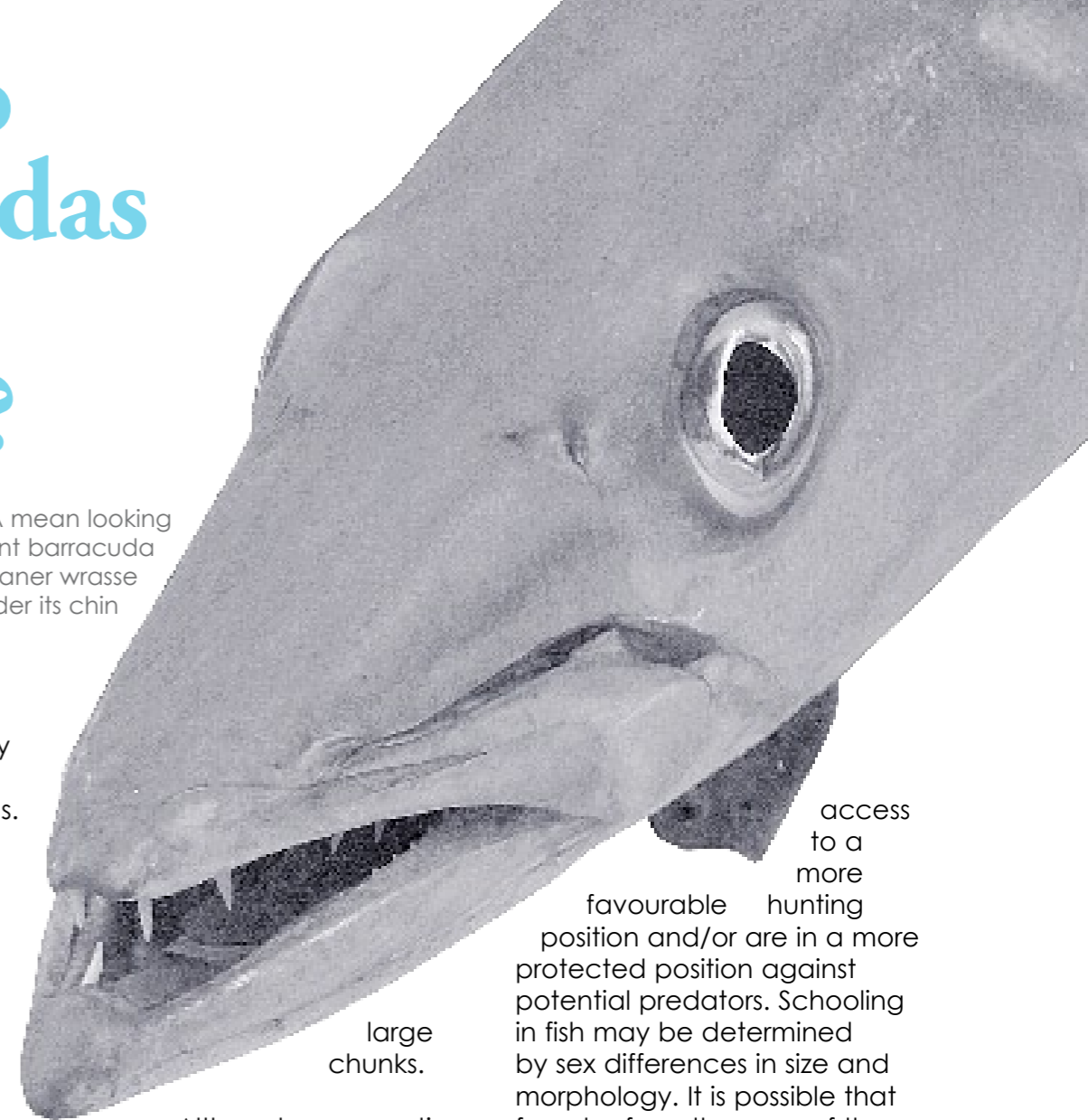
A mean looking giant barracuda has a cleaner wrasse under its chin

Text and photos by Peter Symes

Barracudas occur both singly and in schools around reefs, but also appear in open seas. Adults of most barracuda species are more or less solitary in their habits, while young and half-grown fish frequently congregate in schools.

Large schools of barracudas are associated with offshore seamounts, deep canyons and small islets and dominated by big individuals when a feeding opportunity appears. The reasons for such aggregations are probably resting aggregations, pre-spawning aggregations, anti-predatory advantage and foraging advantage. In fact, group foraging has an obvious advantage since predators acting together can more easily restrict the movements of a school of prey fish than when they are alone.

Barracuda prey primarily on fish, sometimes as large as they are themselves by shearing off



large chunks.

Although aggregations of barracuda were always associated to areas subjected to strong currents, its speed is unlikely to cause aggregating behaviour. Although typically associated with particular sites and current flow, group formation may also be influenced by factors such as social facilitation, prey availability, and behavioural tradition.

Large summer schools appear to be strongly size and sex segregated, because the large females tend to aggregate at the bottom of the school. This maybe due to the fact that females, being larger, have

access to a more favourable hunting position and/or are in a more protected position against potential predators. Schooling in fish may be determined by sex differences in size and morphology. It is possible that females form the core of the school and males aggregate to them for obvious mating advantages.

While barracudas sometimes follow snorkelers and scuba divers across the reef, there exist no substantiated reports of unprovoked attacks. Known incidents generally involve spearfishing or hand feeding, and these incidents are extremely rare, especially considering the number of times that barracudas and humans encounter one another. ■

SOURCE:

BARREIROS, SANTOS & BORBA. CYBIUM 2002, 26(2): 83-88

# fact file

## Malaysia



X-ray mag

SOURCES: US CIA WORLD FACT BOOK, SCUBADOC.COM

**History** Great Britain established colonies and protectorates in the area of current Malaysia during the late 18th and 19th centuries. Japan occupied these areas from 1942 to 1945. The British-ruled territories on the Malay Peninsula formed the Federation of Malaya in 1948. In 1957, it became independent. When the former British colonies of Singapore and the East Malaysian states of Sabah and Sarawak on the northern coast of Borneo joined the Federation in 1963, Malaysia was formed. The new nation faced challenges in its first several years including a Communist insurgency, Singapore's secession from the Federation in 1965, Indonesian confrontation, and Philippine claims to Sabah. However, Malaysia was successful in diversifying its economy from dependence on exports of raw materials to expansion in manufacturing, services, and tourism during the 22-year term of Prime Minister Mahathir bin Mohamad (1981-2003). Government: constitutional monarchy. Capital: Kuala Lumpur

**Geography** Malaysia is located in southeastern Asia. It includes the peninsula that borders Thailand and the northern one-third of the island of Borneo, which borders Indonesia, Brunei, and the South China Sea, south of Vietnam. Coastline: 4,675 km. Terrain: coastal plains that rise to hills and mountains. Lowest point: Indian Ocean 0 m. Highest point: Gunung Kinabalu 4,100 m. Note: Malaysia lies in a strategic location along the Strait of Malacca and the southern end of the South China Sea.

**Economy** Malaysia is a middle-income country. Since the 1970's, it has transformed itself from a producer of raw materials to an emerging multi-sector economy. By attracting investments in high technology industries, medical technology, and pharmaceuticals, former Prime Minister Abdullah, who came into office in 2003, attempted to move the economy toward a higher level in the value-added production chain. The government continues to help boost domestic demand and wean the economy off of its dependence on exports. Despite these efforts, exports, especially electronics, are still a significant force in the economy. The country exports oil and gas and has profited from higher world energy prices. However, the rising cost

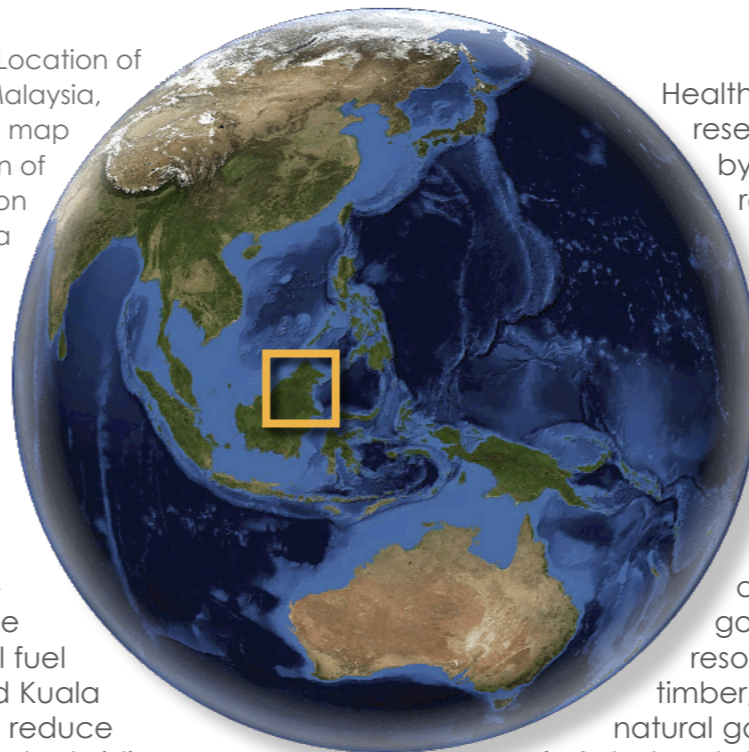
of domestic gasoline and diesel fuel has forced Kuala Lumpur to reduce government subsidies. In 2005, the country released the ringgit from the US dollar which led to its currency appreciating 6% per year against the dollar during 2006-08. It helped hold down import prices but inflationary pressures increased 2007. Inflation stood at nearly 6%, year-over-year by 2008. A five-year national development agenda was presented by the government in April 2006 at which time Abdullah unveiled a series of far-reaching development plans for several regions needing help in attracting business investment.



RIGHT: Location of Sabah, Malaysia, on global map

BELOW: Location of Sipadan Island on map of Malaysia

TOP RIGHT: The trevally's muscular appearance and alert movements reminds one of an athlete in top shape



Healthy foreign exchange reserves are maintained by the central bank. A regulatory regime has helped Malaysia avoid exposure to riskier financial instruments as well as the global financial crisis. Although the economic downturn in 2009 is expected to hurt economic growth with the decrease in demand for consumer goods worldwide. Natural resources: tin, petroleum, timber, copper, iron ore, natural gas, bauxite. Agriculture in Sabah: subsistence crops, rubber, timber, coconuts, rice, logging, petroleum production

**Climate** Tropical. Monsoons are annual in the southwest (April to October) and the northeast (October to February). Natural hazards include flooding, landslides and forest fires.

**Environmental issues** Air pollution from vehicular and industrial emissions; smoke/haze from Indonesian forest fires; water pollution from raw sewage; deforestation.

**Currency** Ringgits (MYR)  
Exchange rates:  
1EUR=5.13MYR;  
1USD=3.50MYR;  
1GBP=5.77;  
1AUD= 3.02MYR;  
1SGD=2.46MYR

**Population** 25,715,819 (July 2009 est.) Ethnic groups: Malay 50.4%, Chinese 23.7%, indigenous 11%, Indian 7.1%, others 7.8% (2004 est.). Religions: Muslim 60.4%,

Buddhist 19.2%, Christian 9.1%, Hindu 6.3%, Confucianism, Taoism, other traditional Chinese religions 2.6% (2000 census). Internet users: 15.868 million (2007)

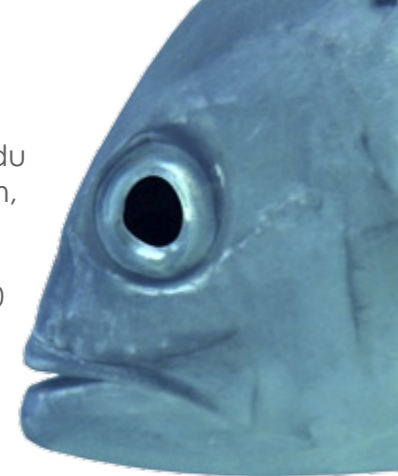
**Travel advisory** Take care and be cautious when boating. The International Maritime Bureau reports there is a high risk for piracy and armed robbery against ships in the territorial and offshore waters in the Strait of Malacca and South China Sea. Make sure your transfers are managed by the dive resort.

**Language** Bahasa Malaysia (official), English, Chinese (Cantonese, Mandarin, Hokkien, Hakka, Hainan, Foochow), Tamil, Telugu, Malayalam, Panjabi, Thai. There are several indigenous languages in East Malaysia; Iban and Kadazan are most widely spoken

**Health** There is a high degree of risk for food or waterborne diseases, such as bacterial diarrhea, and vectorborne diseases, such as dengue fever and malaria. There is a negligible risk of contracting the highly pathogenic H5N1 avian influenza, which has been identified in Malaysia, although there are extremely rare cases among US citizens who are in close contact with birds (2009)

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Sabah Tourism  
[www.sabahtourism.com](http://www.sabahtourism.com)  
Borneo Divers  
[www.borneodivers.info](http://www.borneodivers.info)



Young divers in the Kids Scuba dive camp on Tioman Island, Malaysia, enjoy the underwater world with a few of the cartoon characters from Scuba Rangers/SSI such as (clockwise) Spinner, Sargent Major, Puffer, Captain Kelp and Hammerhead

# Kids Love to Dive

*Reaching out to a new generation of divers*

Edited by Gunild Symes  
Photos courtesy of Syed Abd Rahman and Kids Scuba

One of the largest children's diving clubs on Earth is in Malaysia, where the diving is world-class. X-RAY MAG talked with Syed Abd Rahman, director of Kids Scuba—the biggest Scuba Rangers program in the world—to find out the key to their success and how it is influencing the popularity of diving in Malaysia.

X-RAY MAG: What is Scuba Rangers? What is Kids Scuba? Where are you located?

SAR: Scuba Rangers is a special scuba diving club for kids ages 8-12. Kids Scuba Malaysia started in 2004. We are a member of Scuba Schools International (SSI) and a Scuba Rangers Award Winning Instructor Training Facility. We operate at the Maybank sports center swimming pool in Bangi, just 30 minutes drive from Kuala Lumpur, Malaysia.

X-RAY MAG: Tell us about yourself, your background and why you started Kids Scuba.

SAR: I've been diving about 20 years now in places throughout

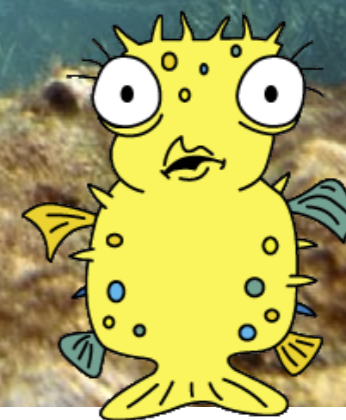
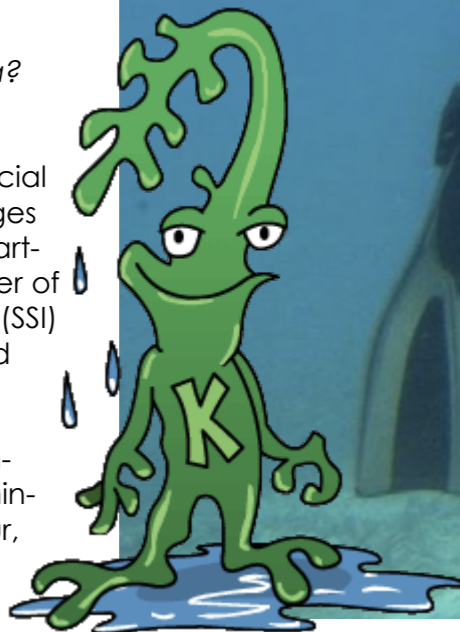
Asia. I am a very keen diver and committed to the sport. I love teaching kids in the sport of Scuba Diving. In fact, my daughter became the youngest

PADI Seal Team diver in Malaysia. Initially, when she followed me on my diving trip abroad, we only saw other kids diving. After her certification, I started Kids Scuba

Malaysia in 2002, with the Scuba Discovery program conducted in the pool. The goal was to let other kids in Malaysia share the sport and enjoy the underwater world

that Malaysia has to offer. I then took my Scuba Rangers Instructor Training course back in 2004 in Singapore. In 2006, I was upgraded to the level of Scuba Rangers

Instructor Trainer for Malaysia and was awarded the Leading Scuba Rangers Club in South East Asia. There was no looking back for me after that! (Smile)





DISNEY "NEMO" BATH SQUIRTER TOY

Kids Scuba

Syed Abd Rahman (in blue third from right) celebrates with the kids, parents and staff of the 2009 Kids Scuba Camp on Tioman Island

enjoying with them the underwater world. The other part is seeing the kids grow with the program, becoming responsible divers with good buoyancy and being good dive buddies who appreciate the marine life and conservation of the marine ecosystem.

email me, not forgetting to remind me over and over about what to do and where to go next. Whew!

X-RAY MAG: What are the biggest surprises, insights, or loves the kids have in diving the underwater world?

X-RAY MAG: What do kids say to you about their experience with Kids Scuba?

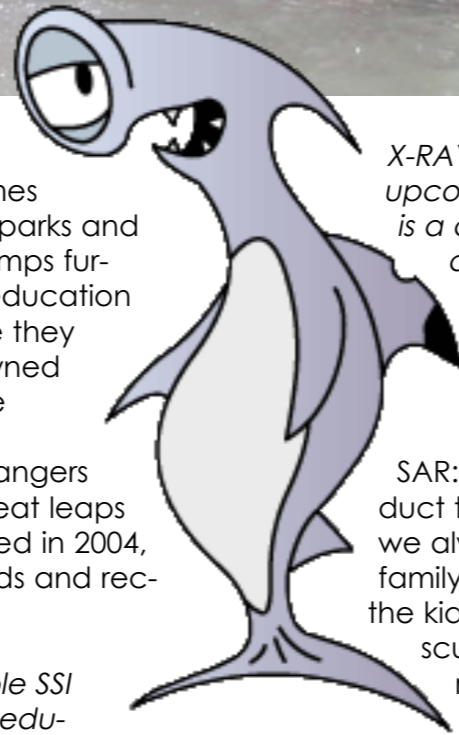
SAR: The kids love the so-called Nemo

X-RAY MAG: Kids Scuba is the largest organization for kids of its kind in the diving world. Why is it so popular and what are you doing that's making it such a success? What do the Scuba Rangers mean to Malaysia and diving in Malaysia?

SAR: The Scuba Rangers program is flexible in that it allows the Instructor to be creative with the speciality courses but within the training standards. An example is the underwater painting ranger speciality program in Malaysia. After teaching the kids through the five sessions of the Rangers level, starting with the Red, White, Blue, Silver and finally the Demo Ranger, the young rangers can look

forward to our Kids Scuba Camps organized three times a year at selected marine parks and islands of Malaysia. The camps further facilitate their scuba education and underwater skills, while they are able to see the reknowned Clownfish "Nemo" from the Disney animation, *Finding Nemo*, in real life. Scuba Rangers In Malaysia have made great leaps and bounds since we started in 2004, gaining International awards and recognition.

X-RAY MAG: Tell us what role SSI has in the Scuba Rangers' education.



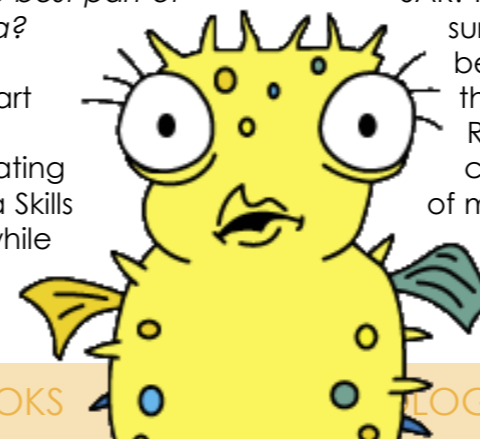
X-RAY MAG: One of the upcoming events of Kids Scuba is a dive camp at Sipadan and Mabul islands. Tell us about it and what kids can expect to do, see, learn when they are there.

SAR: Whenever we conduct the Kids Scuba Camp, we always emphasize a total family-oriented program, where the kids will have a chance to scuba dive at the shallow reefs up to five meters with a ratio of two rang-

ers per Instructor or Dive Leader. The dive is always the first priority! Without fail, the Rangers will be asking me every minute once we reach the island— (laughs)—followed by the education on the marine ecosystem and coral reefs. While we take the Scuba Rangers kids to go diving, moms and dads, brothers and sisters, can have a good time on their own and dive at their own leisure.

X-RAY MAG: What is the best part of your job with Kids Scuba?

SAR: For me, the best part of teaching the Scuba Rangers course is educating the kids the Right Scuba Skills and Scuba Discipline, while



SAR: They love it, and they make sure they checkmate me first before I can even plan for the next event. My Scuba Rangers are my bosses; they can really take the time out of me. They call me, text me on their mobile phones, and

clownfish toys that we put in the pool during their weekly training session. We also include toys such as underwater torpedos, underwater frisbees, and hula hoops, which are placed under water during the rangers training program. One of the most awaited speciality programs we conduct is the Night Rangers



SAR: Scuba Rangers, a kids scuba activity club, was started in 1999 by Paul Oberle of Louisiana, United States. He pioneered child-specific scuba training techniques and educational philosophies. Affiliated with Scuba Schools International (SSI) ([www.divessi.com](http://www.divessi.com)), Rangers Clubs are found worldwide. Though the Scuba Ranger classes cater for kids aged 8-12, parents and teenagers are also welcome, as we encourage a family-oriented water sports program.

New Rangers proudly display their awards and certificates

Puffer (left) Children taking the Kids Scuba Pledge (above)



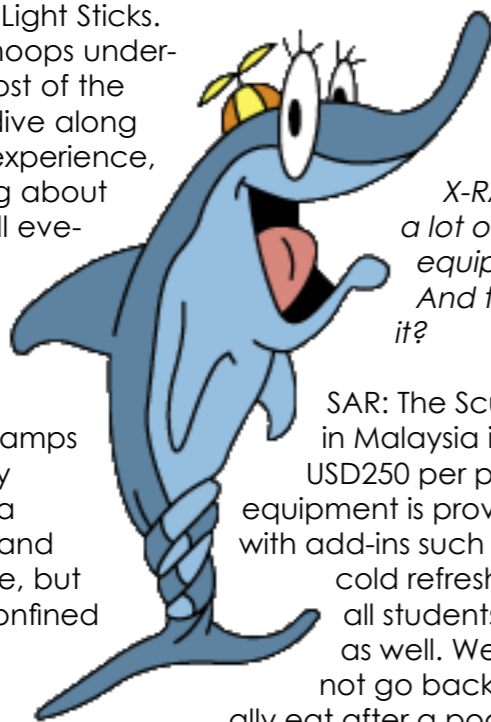
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Speciality, which we only conduct once a year with exclusivity. The rangers get to dive at night in the pool with full dive gear coupled with Dive Torch and Light Sticks. We even decorate the hula hoops underwater with light sticks! And most of the mom and dad divers get to dive along as well. It's really a valuable experience, as the kids will go back smiling about their achievement and will tell everyone in their path—I mean everyone—about their diving experience. After educating them in the pool, the young Rangers look so much forward to the Scuba Camps where they can see the lovely Clownfish "Nemo" for real, sea turtles, the Sargent Major fish and appreciate the real marine life, but to a limit of five meters in a confined water environment.

**X-RAY MAG:** How can kids and parents get involved? How do they get signed up for the next camp at Sipadan-Mabul?

**SAR:** We will inform the Scuba Rangers well in advanced about our camps, and we will published it on our website for the yearly Scuba Camp calendar. We also have a bulletin board at the pool and inform the Rangers and moms and dads on the Scu-

ba Camp dates and venues. As the camp is open exclusively to the Scuba Rangers and Families. The Kids Scuba Camp in Mabul/ Sipadan has been full since July 2009, with 97 pax in total with 61 divers.



**X-RAY MAG:** Does it cost a lot of money? What about equipment? Is it expensive? And travel? How expensive is it?

**SAR:** The Scuba Rangers course in Malaysia is about RM850.00 = USD250 per pax for five sessions. All equipment is provided during the course with add-ins such as breakfast, hot and cold refreshments, and lunch for all students with moms and dads as well. We make sure the kids do not go back hungry! They can really eat after a pool session. An average Kids Scuba camp costs about RM1000.00 = USD350.00 per pax including accomodation, diving and land transfers. The rates are applicable to the western Malaysia islands, but are not applicable to the islands off Sabah, as they offer different rates.

**X-RAY MAG:** What is the most important aspect, insight, inspiration you and participants get from Scuba Rangers?

Scuba Rangers of the Kids Scuba booth at the Malaysia International Dive Expo (MIDE) 2009 in Kuala Lumpur

**SAR:** The Scuba Rangers have a very important pledge that says: "As a Scuba Ranger, and a member of the diving community, I pledge to have fun, continue my diving education, protect the aquatic environment, dive responsibly, and participate in my community, my family, and my future in a positive way. Way to go, Scuba Rangers!" All rangers have to recite the pledge every time as a group before the start of the class.

Scuba Rangers is the only dive course in the world with a pledge, and it's a very healthy pledge covering the areas of fun, education, aquatic environment, responsibility, community, family and the future. Maybe the other agencies should follow suit as well. Just kidding!

**X-RAY MAG:** Where do the participants come from?

**SAR:** The participants come from various



## RECOGNITION & AWARDS

Asia Dive Expo (ADEX) Singapore April 2006: "Rising Star Award – South East Asia " from SSI International for achievements in certifying the most numbers of SSI Scuba Rangers in Asia and organizing the first Kids Scuba Camp in South East Asia in March 2005

Malaysian International Dive Exhibition (MIDE) Kuala Lumpur in July 2007: "The Best Dealer Award 2007 – Scuba Rangers Certifications"

Asia Dive Expo (ADEX) Bangkok April 2008: "Single Largest Scuba Rangers Program in the World" from Mr. Ed Christini, Director of International Division, SSI International from Colorado USA

Malaysia International Dive Expo (MIDE) Kuala Lumpur, July 2008: "Sports Diving Magazine - Australia Award" for the success of Malaysia SSI Kids Scuba and Scuba Rangers program in Malaysia

Malaysia International Dive Expo (MIDE) Kuala Lumpur, July 2009: Three awards, namely, "Best Scuba Rangers Club", "Best Scuba Rangers Certification" and "Best Scuba Rangers Instructor Award" for the success of Malaysia SSI Scuba Rangers program in South East Asia

Syed Abd Rahman (left of banner) with children participating in the Kids Scuba Camp on Tioman Island

Syed Abd Rahman, Director, Scuba Educator  
SSI - Scuba Rangers Instructor Trainer #21643  
SSI - Dive Control Specialist Instructor #21643  
ITDA Sports Diving Instructor Trainer # 298868  
IHMP Dive Medic Instructor #298866

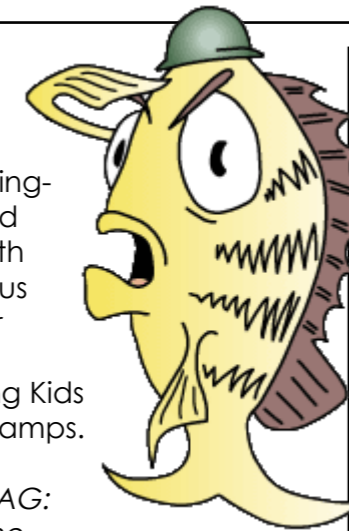
KIDS SCUBA "Underwater Adventure For Kids" SSI Award Winning Instructor Training Facility; The Leading Scuba Rangers Club in Asia & The Largest in the World 2007; Tel: 6019-3176705 (Syed) or 6019-3826705 (Nadia) Dive Center: 603-51918005; Email: [kidsscuba@yahoo.com](mailto:kidsscuba@yahoo.com) Website: [www.kidsscuba.com](http://www.kidsscuba.com)

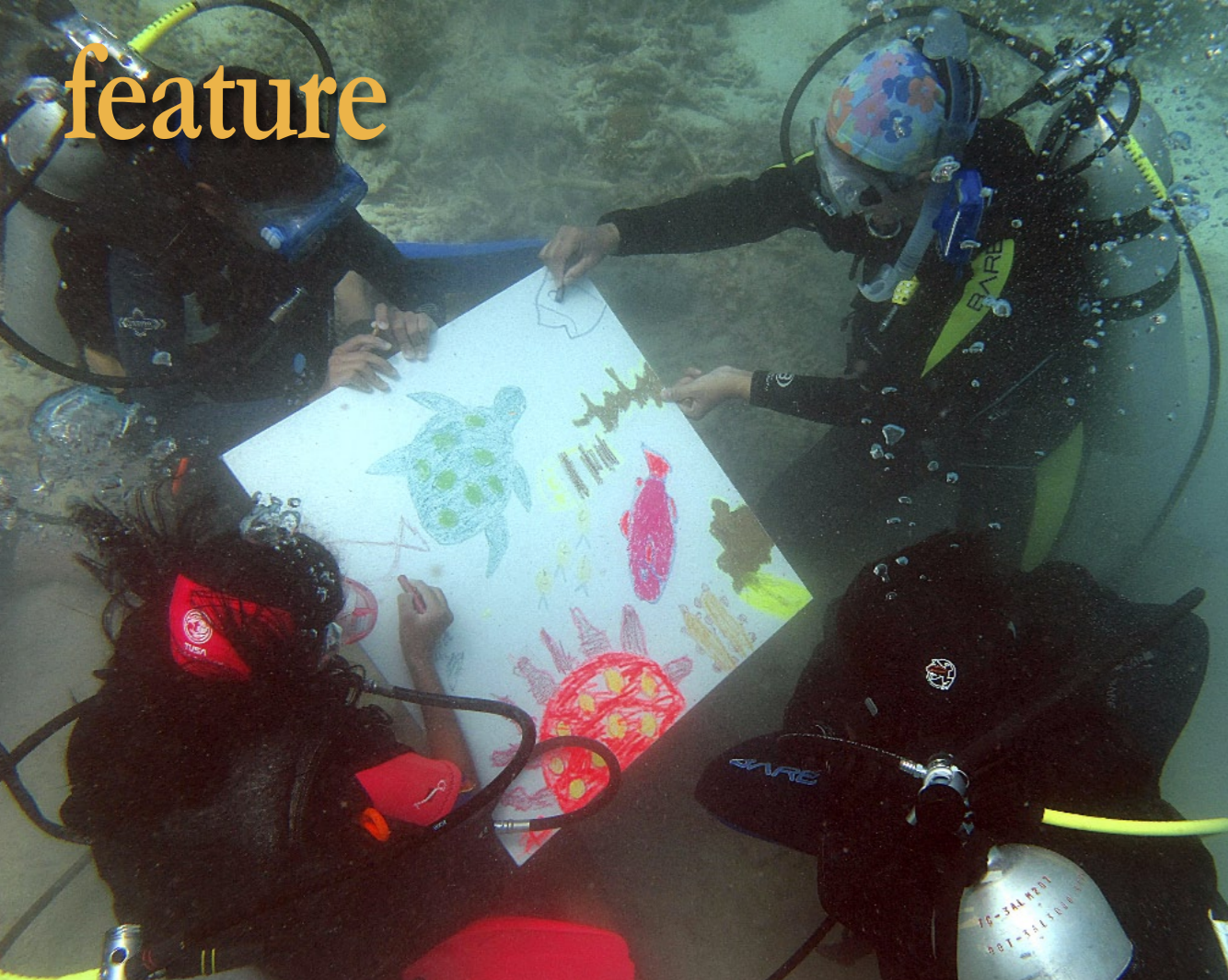
parts of the region. We have families from Singapore, Hong Kong, United Kingdom, Australia, United States and even South Africa joining us during our past and upcoming Kids Scuba Camps.

**X-RAY MAG:** What is the impact of Scuba Rangers on diving as a sport in Malaysia? Do you get a lot of support from area dive businesses and resorts? If so, how do they help? What more do you need from interested dive businesses who want to get involved?

**SAR:** The Scuba Rangers have a good and

*The Scuba Rangers have a good and healthy impact on the sport in Malaysia.*





Scuba Rangers drawing what they see, creating art under the waves

trainer and consultant. I can be reached at kidsscuba@yahoo.com or my office in Subang Jaya, Malaysia at tel. +603-51918005 or mobile at +6019-3176705. Our website is www.kidsscuba.com.

X-RAY MAG: What else would you like our readers to know?

SAR: Kids Scuba in Malaysia organizes Main Kids Scuba camps for Scuba Rangers and their families three times per year (on Malaysian school holidays) to various lovely marine parks and islands in Malaysia, such as Tioman Island, Redang Island, Lang Tengah Island, Langkawi Island and the lovely islands of Sabah.

healthy impact on the sport in Malaysia. It has grown with a strong impact on sports tourism to promote the islands in Malaysia as a dive destination that caters to families as well.

Yes, we do have good and strong support from the Malaysian government, Tourism Malaysia, state government as well as selected dive resorts and instructors of all levels and agencies in Malaysia.

The Scuba Rangers in Malaysia gets very strong support from the local media, TV stations, newspapers and magazines, which cover our programs regularly.

They (the media) actually have a very strong impact on the Scuba

Rangers program in Malaysia.

X-RAY MAG: Any future plans for Kids Scuba Malaysia?

SAR: We plan to train more Scuba Rangers Instructors in Malaysia and in Asia and to expand the program to the other regions as well, such as India, China and the Middle East. This in turn will educate more Scuba Rangers to be responsible divers with good and knowledgable underwater skills.

X-RAY MAG: What would you tell other directors who want to start a similar program in their locations? Will you help them as a consultant? If so, how? And how can they reach you?

SAR: I would very much like to assist in any way possible if any course directors, instructors, or resorts want to start a Scuba Rangers Program anywhere. Yes, I will assist and help them as a

## Kids Scuba

hundreds of the "little and cute Scuba Rangers" we have trained grow and become good and responsible teenage scuba divers with good values, appreciating marine life and the ecosystem.

*For me, the hundreds of Scuba Rangers we have trained are the next, future generation of divers. It is up to us to educate them and give them the right values to appreciate ocean life and the marine ecosystem.*  
— Syed Abd Rahman

For me, the hundreds of Scuba Rangers we have trained are the next, future generation of divers. It is up to us to educate them and give them the right values to appreciate ocean life and the marine ecosystem. If we don't do it now, we might not know what's going to happen 15 to 20 years from now to the lovely marine parks of the world... Let's all do our bit for the environment of the ocean starting with the young ones. ■

## Dive T-Shirts for Kids

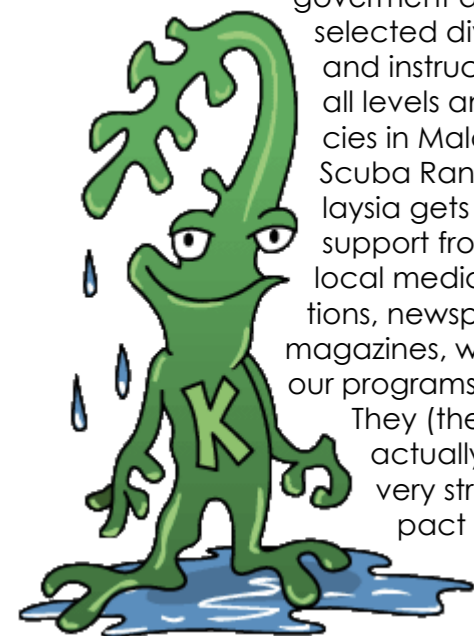


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Scuba Rangers at MIDE 2009



## Books & DVDs

Edited by Catherine GS Lim

POINT & CLICK  
ON BOLD LINKS



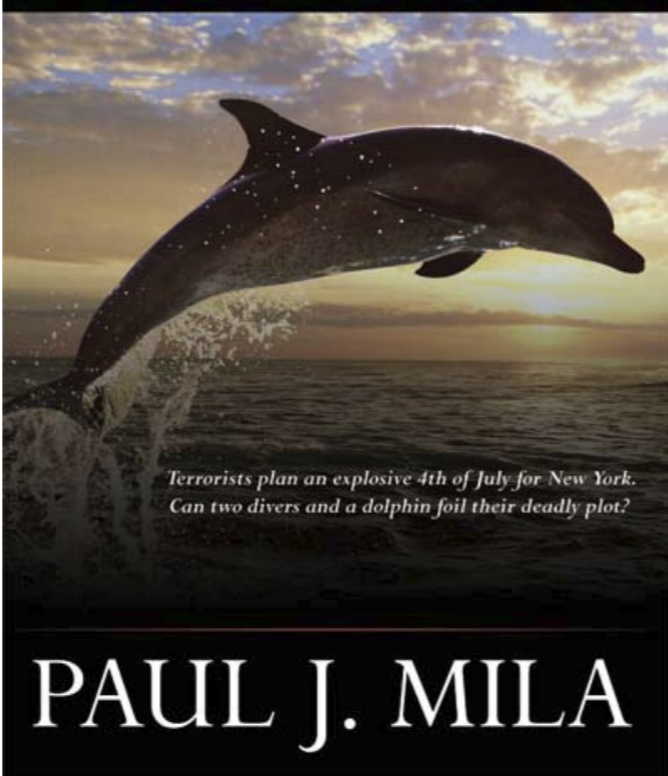
### The Underwater Photographer

Many have found Martin Edge's third edition of this title to be a very comprehensive volume on underwater photography. Although intended for the experienced photographer, beginners would have little trouble following and incorporating the many techniques discussed into their shooting. This book begins with a quick refresher on the basics of traditional photography, like shutter speed, f-stops, depth of field, etc. The next part moves on to digital photography, so terms like

megapixels, file types, memory cards are carefully explained. Later chapters discuss the ins and outs of using the SLR and compact cameras underwater, as well as composition, lighting, and taking close-up/macro and wide angle shots. Needless to say, Edge's renowned 'think and consider' system of taking photos is also covered. The beautiful photos in the third edition both inspire and awe, while Edge's easy-to-follow directions provide readers with the knowledge to aspire to such heights. Consider this book to be one of those must-haves to slip into your camera bag on your next dive trip. A fourth edition is due to be published by Focal Press this November, and is slated to be heavily revised and expanded, so watch out for it!

By Martin Edge  
480pp. 7.44 x 9.69 inches  
4th edition in Nov 2009  
ISBN 9780240521640

### FIREWORKS



### Fireworks

The idyllic lives of scuba divers Terry Hunter and Joe Manetta are disrupted when they agree to help foil a possible terrorist attack during Queen Elizabeth's 4th of July visit to New York. Also sucked into the plot

is Notchu the dolphin, who is whisked from the pristine waters of the Caribbean to the murky waters of the Hudson Bay.

As with the previous two books in the series, *Fireworks* is a page-turner. The characters are immediately likeable, making the reading of this novel a pleasurable experience. However, compared to the main characters, depictions of the terrorists' motivations could have been more substantial. Nevertheless, the descriptions in the book are meticulous and detailed, though not tedious to read.

Throughout the novel, the writer's skilful writing brings the reader along for the ride as he drops in on the different situations faced by the various characters, giving us a glimpse into their world and experiences. Don't forget to pack this book along with your dive gear on your next dive trip!

By Paul J Mila  
Published by AuthorHouse  
ISBN-13: 978-1438900698

### Gorontalo Hidden Paradise

Review by Simon Kong. A fantastic coffee table book by Gorontalo dive pioneer Rantje Allen, *Gorontalo Hidden Paradise* says it all. Gorontalo is located in north Sulawesi and is recently becoming the hottest dive destination in Indonesia.

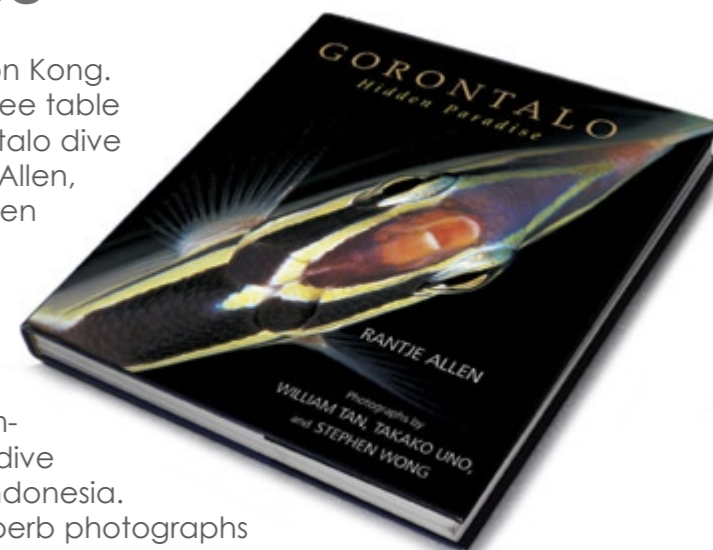
It features superb photographs by world renowned underwater photographers William Tan, Takako Uno and Stephen Wong (their names alone are justification to buy this book).

Rantje writes with an easy style that takes you along with the photographers in their limited shooting time to photograph Gorontalo's unique marine life.

Special mention must be made for William's pictures as they stand out the most. No surprise considering he spent up to five hours a day in the water posing as a piece of rock and vowing never to repeat it again. His pictures speak for themselves, and this can be seen in a beautiful four page fold out featuring blue ring octopuses fighting.

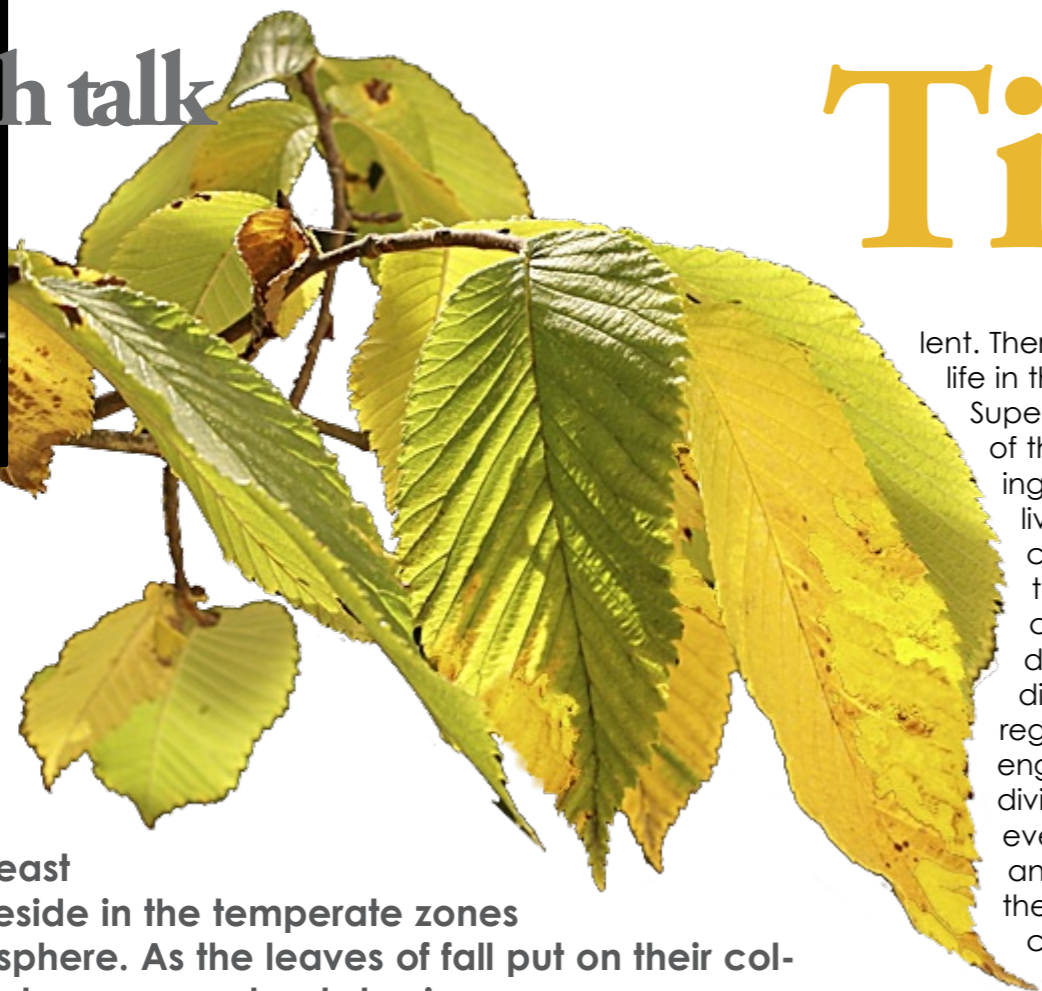
In trying to cross reference the species featured I find that my library of marine life reference books are woefully outdated, even though they were recently published. Credit goes to the photographers and writer for coming out with an up-to-date great piece of work that invites you to discover this hidden paradise called Gorontalo.

By Rantje Allen  
Photographs by William Tan,  
Takako Uno and Stephen Wong  
Published by Snow Publishing  
ISBN: 981-05-6129-6  
290 X 250mm hardcover  
160 pages in full colour  
First published in 2006





# Time to dive dry? *What's bubbling?*



Text by Peter Symes and Roz Lunn, with additional quotes from our readers

**Autumn is here—at least for those of us who reside in the temperate zones of the northern hemisphere. As the leaves of fall put on their colourful display, we go about stowing away our summer garments and getting out the winter clothes. In regards to what you wear underwater, that means getting out the dry suits.**

My late grandmother always professed that there were no such thing as bad weather, only bad clothing, and made us wear our oilskins before she shoved us kids out to play in the rain or snow, so she could have a bit of peace and quiet. She was right y'know. Not about the bit of quiet, but about the importance of wearing the right garments.

I've always been comfortable in the water, and happy as a puppy even under horrible weather conditions, simply because I dressed properly and warmly enough. On a frigid day, that could mean putting on a couple of extra socks, or wearing long underwear.

Diving in winter is underappreciated, I find. The coolness of the water means less algae, and the viz is often excel-

lent. There is also different animal life in the cooler part of the year. Superior thermal insulation is one of the main advantages of diving dry, but you don't have to live in colder climes to appreciate this property. Even in the tropics, the water can be cool at depth, which is why dry suits are also favoured by dive guides and instructors in regards to warmth, and if you engage in any kind of technical diving, they are a must. A more evenly distributed buoyancy is another property of drysuits that the diver soon comes to appreciate.

## Getting one

For most divers, a drysuit is the single largest investment in diving equipment they will ever make. So, you better make sure that you make the right purchase and don't rush into anything! Chances are that you will have your suit for many good years.

When it comes to a wish list, where do you start? Checking out

the options and asking around on the internet will soon get you bombarded with (sometimes conflicting) advice from friends, forums, websites and instructors. So, let's start at the beginning.

## Define your needs

Most diving in temperate and cold water is now done in a dry suit, simply because it's warmer. But actually, the current thinking is that any type of diving that increases thermal loss, thereby decreasing comfort and safety, may be better done in a dry suit. This includes dives that call for little movement such as photography, deep diving, long dives in warm water (especially if they involve long stops) and repetitive diving, particularly if you tend to chill down easily.

Thermal insulation aside, proper fit and freedom of movement are also important properties to consider. Nothing is more annoying than a suit that doesn't fit, hinders your movement, or worse still, leaks.

While the basic concept and operation of a dry suit has remained unchanged over the years, there have been vast improvements in materials and designs, making them warmer, more flex-

ible, and more durable. Modern dry suits are high tech, too.

As most are probably well aware, dry suits come in two basic flavours, which we can call *membrane* and *neoprene*, with a number of intermediary forms in between.

## Membrane suits

A membrane suit is basically just a thin watertight shell under which a separate layer, or undergarment, is worn to provide thermal insulation. Consequently, the suits themselves can be quite lightweight, and therefore, easier to travel with, as they can be rolled up into a small bundle.

Most membrane suits are made from a thin, pliable material called tri-laminate consisting of three sandwiched layers:



In a membrane suit, the diver will have to wear an undergarment for thermal protection. The membrane just keeps the water out. This suit is fitted with a cuff for a dry glove, which just snaps on





*“Drysuits aren’t just about thermal protection under-water. They keep you much warmer between dives, particularly on boats, which makes it much more likely that you will do more than one dive per day.”*

nylon as the inner lining, butyl rubber as the watertight membrane in the middle, and Cordura as the protective outer layer. This superbly flexible material is extensively used in drysuits, because it is quite resistant to abrasions, punctures and tears. It is also light, very flexible, requires little maintenance and is easy to patch and repair. Some suits also make good use of Kevlar—which is practically impenetrable—either just for patches on particularly exposed areas, such as the knees, or the whole suit can be covered by it.

Typically, technical divers will go for membrane suits, because they offer better freedom of movements, which, for example, is essential when you want to reach your gas valves behind your neck.

But as the suit itself offers the diver no thermal protection, a separate undergarment has to be worn. The diver has, of course, the option of varying their thermal protection according to the ambient water temperature at depth. The combined purchase of a membrane suit and a top-of-the-line undergarment will often be more expensive than buying a neoprene suit.

### Neoprene suits

A traditional neoprene dry suit basically has just one main layer, which provides both thermal insulation and a watertight barrier. In its simplest form, it is essentially an upgraded wetsuit, equipped with various seals and a watertight zipper to keep water from entering, plus a couple of valves. This one-layer concept

Neoprene drysuit. Aside from an inner lining, the suit consists of one layer, which provides both the water barrier and thermal insulation. On this particular model, which comes from the lower price range, the zipper is not protected by a flap or cover (compare to the suits pictured on the next page) which means increased wear and tear

New materials. Drysuits are going hi-tech, too. What you see here may be the new thermal protection layers in future drysuits



may provide a more affordable complete solution, but may also come with a number of drawbacks.

One, is the loss of insulation—and buoyancy—as the suit material compresses with depth, something every wetsuit diver is quite familiar with. The loss of insulation can be offset by wearing some sort of undergarment, but you still have the issue of marked buoyancy changes.

### Crushed and compressed

Another option is going with more expensive materials such as compressed or crushed neoprene. The main idea of using these materials is that they don't undergo the same degree of compression with depth, and as such, maintain the same level of insulation and buoyancy regardless of depth. In turn, that means that the diver will still need some extra layer of garment underneath for thermal protection, though much less than with a shell suit.

In many regards, suits of compressed or crushed neoprene can be regarded as hybrids, which combine the best of neoprene and membrane suits.

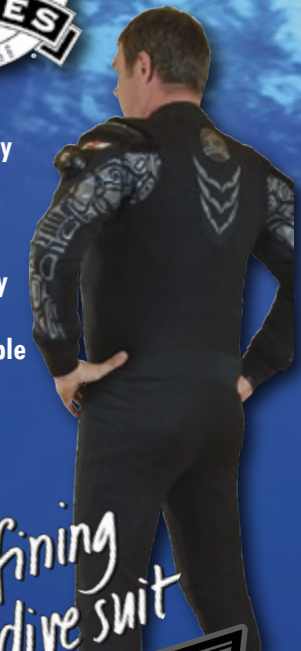
Crushed neoprene has the flexibility of a tri-laminate, the strength of neoprene, and the material stretches slightly. This means that the suit can be cut for a snugger fit without impairing the diver's movement. The diver benefits from no inherent buoyancy changes whatsoever. This suit behaves exactly the same at 100 metres, as it does on the surface. Not unsurprisingly, these types of suits belong with those at the top of the range, both in terms of quality and price.

### Clearing up the confusion

Crushed and compressed? The term *compressed* is often used in a confusing manner. Neoprene is a family of synthetic rubbers with a foamy texture in which airspaces are filled with nitrogen. The material is produced in big sheets of different thicknesses, which undergo some compression process during their manufacturing. So, in essence, all diving neoprene is compressed. What is often meant by *compressed* is that a standard 7mm neoprene has been further compressed to say 4mm, but often the 4mm variant is just made of a thinner material. Crushed neoprene has undergone heating and pressure to produce a neoprene that is both tougher and stretchier. Under a microscope, you will find the compressed material still has round bubbles, while the crushed material cells are flat. Microcell neoprene is another material with 20 percent smaller bubbles than conventional neoprene. ■



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## Design

The importance of finding a suit that both fits correctly and allows for plenty of freedom of movement cannot be emphasized enough. How flexible the suit is depends not only on which fabrics are used but also on how the material is cut and put together, just like other garments. Fortunately, we have seen much improvement in how suits are designed.

**Biased cut** is now being adopted by the pro-active manufacturers. Traditionally, fabrics were cut along the warp or weft. Now the manufacturers have discovered that if they cut the cloth on the diagonal to the warp and weft, (known as the bias), the fabric has a lot more natural stretch.

Tri-laminate suits that do not utilize the bias cut have less inherent stretch, so they tend to be cut on the generous side to allow the diver a full range of movement. They also are more baggy to allow for the undersuit, (providing the thermal protection). This can result in the diver suffering from drag, as they move through the water. Some membrane suits are also designed with telescoping torsos, which can make a huge difference when it comes to freedom of movement.

## Fit

Neoprene suits have a snugger fit, because they are cut differently, as there is not such a need to wear so many thermal layers to keep the diver warm. Whilst the diver benefits from a sleeker fit, they can lose out in other ways. The snug fit makes it harder to don and reduces flexibility, impairing the diver's movements. If you are thinking about moving into technical diving, this is not a suit for you. Gas shut downs can be a nightmare, or worse, impossible. Unfortunately, as neoprene ages, it becomes less flexible, worsening this problem. Another property, which is also lost as the fabric ages, is insulation.

## Try it on!

Some manufactures offer made-to-fit, or bespoke, dry suits at a nominal extra charge. So, if any of their standard stock sizes do not fit you well, it will often be worth the extra expense to get it custom fit. In particular, you need to check if you can move your arms freely, and that you can reach the valves.

Does the suit allow you to stretch an arm without pulling on a sleeve and tugging on a wrist seal so it will let in water? Can you turn your head freely? And does it allow you to squat?

Often the standard across-the-shoulder configuration of the drysuit zipper will make it more difficult to reach behind your head.

## Zipper configuration

The standard arrangement is placing the zipper across the shoulders, as it is shown on the first page of this article. Here, it is less exposed to wear and tear, but

unless the diver is a contortionist, the zipper is out of reach, so closing and opening the suit will require the assistance of a buddy.

In our recent survey, most divers stated that they preferred to be able to take their suit on and off without assistance. The two suits depicted on this page show two other zipper configurations: one that goes diagonally across the shoulders (center), and one that goes across the chest (right). These configurations are usually a bit pricier, but is often worth it.

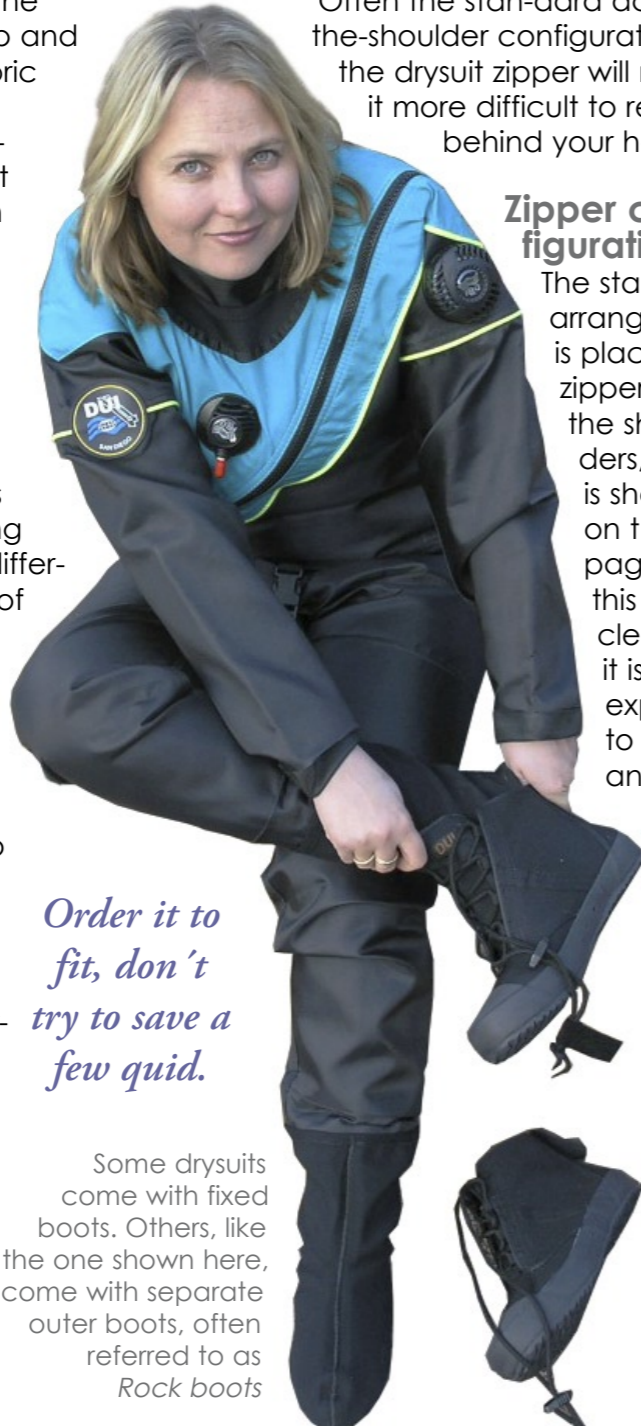
The way the suit on the right is designed also provides for what is called a telescopic torso, which gives the diver more mobility lengthwise. Other, but now mainly obsolete, ways of placing the zipper includes running it between the legs and around the head.

Since the zippers are exposed to wear and tear they will ultimately wear out and have to be replaced. The zippers are not cheap, which is why, on some

*It would be nice if the industry realized that short females also want reasonably priced drysuits that fit*

*Order it to fit, don't try to save a few quid.*

Some drysuits come with fixed boots. Others, like the one shown here, come with separate outer boots, often referred to as *Rock boots*



models, the zipper sits protected under a flap or outer layer.

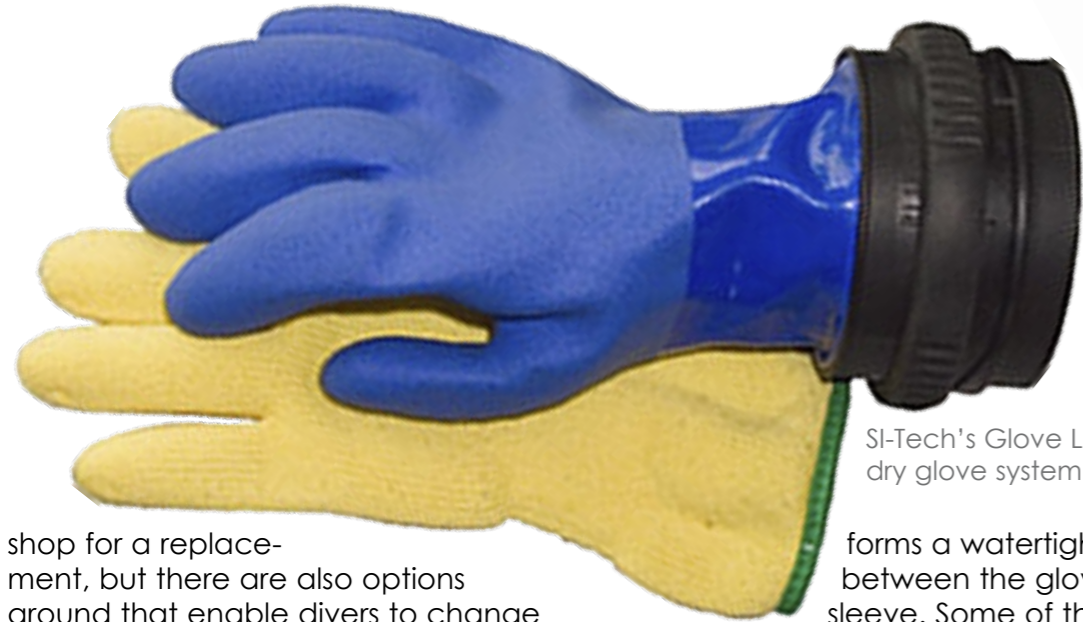
## Seals

Latex or neoprene is the main choice though silicon has just been introduced as third alternative—good news for those who have a latex allergy. Latex has a snugger fit, but doesn't insulate like neoprene, so the diver needs other thermal protection at least around the neck. Latex also tears easily—a careless diver with a sharp finger nail can poke right through the material. Neoprene seals are warmer, but fit less tightly, which may be an issue for some. A neoprene seal is to be folded back and tucked in, like an inverted turn-up, in order to seal properly.

Few items are as useless as a drysuit with a torn seal. Often, it can only be fixed by a trip back to the repair

*Beware: Sunscreens and oils can deteriorate latex seals*





SI-Tech's Glove Lock dry glove system

shop for a replacement, but there are also options around that enable divers to change seals themselves—something that could save a weekend. Some user-replacable neck seals are shown on page 67.

### Dry gloves

If you are diving in cold water, there is no way around dry gloves. A number of brands have marketed various designs over the years, but they are all variations of the same basic theme in which a two-part locking system

forms a watertight seal between the glove and sleeve. Some of the designs work using friction where the diver just squeezes the glove onto some sealing o-rings, while others have twisting rings that lock and/or unlock the glove.

### Hoods

Using loose hoods seems to be gaining popularity, and not without reason, as one can essentially find the hood that suits one best. Also a separate hood



makes it more comfortable to wear the drysuit between dives i.e. while underway to a dive site.

### Boots

The vast majority of suits have built-in boots, though it is possible to opt for good ankle seals instead. Some of the

*I cut my fixed hood off and use a wet hood. I did not like the restriction of the fixed hood.*



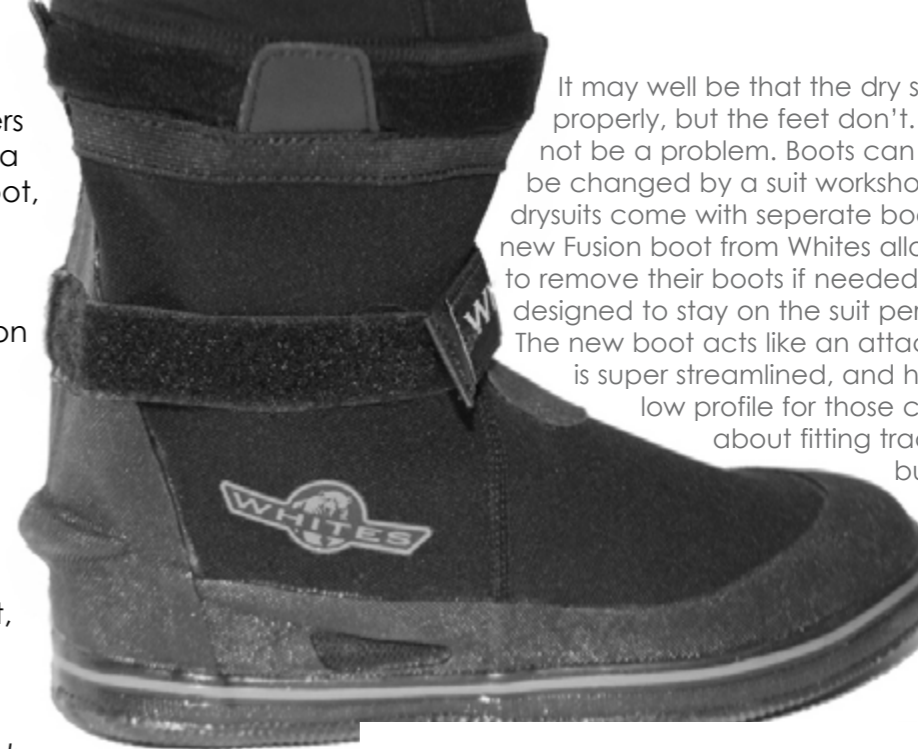
manufacturers will give you a choice of boot, and again, wear your thickest thermal protection to help get it right. It's not really worth going for boots with thin soles. Although they are light, you do get to experience the

"ooh-aarrh-ouch" factor in its full glory, as you trog over rocky shores and stones. Neoprene lined boots are warm and snug, so this can mean you have to go up a size, but all in all, these are a popular choice. For those of you who teach on a commercial basis, heavy duty

*Never use a fixed hood on a dry suit for sports diving. Use it only if you hate working. It can hurt your muscles in the neck.*

boots, especially heavy duty boots with a heel, are worth considering. Commercial divers are catered for with heavy duty steel boots complete with steel soles and toecaps.

And then you have DUI. They have always done things differently, and until recently, I really hated their boots because they were effectively socks with a sole glued to the bottom. Horribly flappy things, and it was this one feature that really put me off buying one of their suits. Happily, this all changed with the advent of the Rock Boot. These days the diver still has a "sock" on the end of their suit, but they now don a pair of rugged boots to dive in. A boon for divers who walk and climb to sites.



It may well be that the dry suit fits you properly, but the feet don't. This need not be a problem. Boots can easily be changed by a suit workshop. Some drysuits come with separate boots. This new Fusion boot from Whites allows users to remove their boots if needed, but is designed to stay on the suit permanently. The new boot acts like an attached boot, is super streamlined, and has a super low profile for those concerned about fitting traditional bulky drysuit boots into their existing fins

Hotfoot drysuit socks from Fourth Element are made up of a high density fleece combined with water resistant outer fabric. Designed to fit the feet, these socks will stay on when taking off your drysuit



### Valves

Most suits are already fitted with valves, so most of the time, you don't really have an option of choosing. Inflators and suit dump valves are dominated by two manufacturers: SI-Tech and Apeks, which over the years have constantly strived to design more streamlined products with low profile.

A good inflator valve should be able to swivel in full circle, so you

Standard placement of the valves on a drysuit valves. Make sure that you can easily reach and operate both of them. This suit comes without a fixed hood



can route your inflator hose any way you want. Your dumps and inflators should be of the same brand, as the two products have been designed and tested to work together.

The inflate button on my suit can be difficult to find within the large inflator assembly. Having a raised, or otherwise obvious, inflator button would be nice, especially because thick gloves are used, and hands are sometimes too numb to feel the button accurately.

When it comes to dumps, there are two main types—shoulder dumps and cuff dumps—though the latter seems to be going out of fashion. A cuff dump is automatic and idiot proof, and approximately the size of a small marmalade lid. A cuff dump is normally located on the left hand arm, above the wrist seal. To vent air, the diver just raises their left hand. This can cause problems with involuntarily dumping of air when teaching, photographing, deploying a surface marker buoy, or hanging onto a shot line.

A cuff dump also means that you might not be able to have a computer on that wrist, as it will impair air flow. That said, this is a good option for new divers, because it is so simple to use.

I prefer a shoulder dump. It's adjustable. By turning the dump valve, you can control the degree by which the air is vented off. This means that I can screw it down to stop gas escaping, if I have a very long decompression stop. It can be set to automatic, so as you rise, the air inside the suit expands and thus escapes through the dump. Alternatively, you can hold the dump down to allow more air to escape.

### Gaiters or ankle weights

Ankle weights are an easy way to distribute weight more evenly along your body and help keep



Drysuit gaiters from Halcyon attaches with velcro

your feet down, if you have a tendency to have floaty legs. If you don't like finning with added weight around your ankles, gaiters, which wrap around your shins, may be the solution for you.

### P-valves and zippers

Sorry, gals, these inventions just cater to men's needs. A p-zipper, like the one depicted below, allow the gent with an urgent need to perform his business without having to get out of his suit. These extras are a bit on the pricey side and constitute an added point of failure, so why not just make it a habit to go to the men's room in a timely fashion?



A convenience zipper is mostly for users who wear their suit all day long, such as professionals

A P-valve is a device for technical divers allowing the diver to urinate into the water at depth by the means of a condom-like attachment and hose that passes through the suit.

### Pockets

Pockets are invaluable for stashing all sorts of things such as a spare mask, D-SMB (Delayed Surface Marker Buoy), a reel, a slate, and a backup torch.

Placing cargo pockets on the front thigh seems a good idea, but positioning them on the side is often a better option. There is less in-water drag, as the pockets are in the slipstream of your shoulders, whilst giving easy access to the contents.

This is something you need to keep in mind should you start using side-mounted stage cylinders. When you are diving with a stage, accessing a front cargo pocket for your D-SMB is a bit tricky.

Front-mounted cargo pockets can also get in the way when you are rib diving, as they tend to catch when climbing back into the boat.

When you stand with your arms by your sides, the bottom of the pocket should be placed in line

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with the ends of your fingers, whilst being sufficiently above the knee, so that the pocket doesn't get in the way of your finning.

As for fastening your pocket, one camp advocates that cargo pockets should be zipped up, so that items don't fall out. Others say that Velcro is best for easy access, arguing that zips may jam when you least want them to. Drain holes are a must, and it's a sensible idea to have a method of attaching things to prevent everything from falling out. Bungee is a popular choice. It allows you to pull out the entire contents of your pocket, grab what you want, and replace the remainder.

A bungee loop is better than a clip, as you can always cut a piece of bungee should it get tangled.

### Brace yourself

If your suit does not come with braces, or suspenders, go and get yourself a 'Fit your own braces' Aqua Pack. Braces also allow you to wear your suit partially donned without you having to clutch great armfuls of suit. If you are not careful, you can damage your zip should you wear your suit half donned.

With a front donning diagonal entry suit, it is better for the suit if you wear it either fully on, or take it off. If you wish to wear it half



Drysuit zippers must be lubricated prior to every dive with bee's or paraffin wax. Only the outside of the zipper should be lubricated, and it's best to do it with the zipper closed



### Looking after your suit

Drysuits require more maintenance than wetsuits. Be sure to rinse your suit with fresh, clean water after every dive.

Inspect the seals, valves and zippers for damage, and get repairs done on any item that is not operating properly. If the inside of the suit is damp, or wet, it must be rinsed, too. Check for moisture in the bottom of the boots. After rinsing the suit, hang it over a clothesline (out of the sun) to dry. Don't use a hanger, as this places stress on the suit. Turn the suit inside out carefully. Never put your suit away for storage unless it is completely dry inside, or you'll end up with mold or mildew.

Drysuit zippers must be lubricated prior to every dive with bee's or paraffin wax. Only the outside of the zipper should be lubricated, and it's best to do it with the zipper closed. Be sure to wipe off any bits of wax that fall off the zipper. Never use silicone spray on any part of your drysuit. It will work its way into the base suit material, making it difficult to make good repairs in the future. Different manufacturers recommend different methods for storage. Some say to roll the drysuit up and leave the zipper open, while others recommend closing the zipper. However, all manufacturers agree drysuits should be stored in a sealed bag in a cool, dry place, away from sources of ozone, such as electric motors or hot water heaters. Follow these simple drysuit diving tips and you'll soon be diving like a pro. There's no substitute for a drysuit when the water turns chilly! ■

donned between dives, then take time to pull the arms through the braces to take the weight of the suit, or knot the arms around your waist. If you let the full weight of the suit hang down on the braces, over time, the zip can suffer unnecessary strain because it is bouncing on the braces, and it will bend and flex. A front-donning suit zip can last longer than a back entry zip provided you don't go around with the suit open, folded back, and hanging on the braces. ■



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NO ICE CUBES AND SPARKLING DRINKS.

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www.ursuk.com



# Some of the latest & hottest

Some two months prior to going to press, we wrote all known manufacturers of drysuits asking them to supply us with information and images on the latest models.

## Whites' Fusion

The popular Whites Fusion has won over countless divers over for the last couple of years. One of the popular benefits of the Fusion is the removable, replaceable skin. Canadian manufacturer Whites has now launched four new Fusion skins in addition to the lycra sport skin, limited edition skin, and the tech skin with grey graphics. The flagship tech skin will now be available in black with red, yellow, navy, and pink graphics. Users can now have a different skin for different dives; for the cost of a wetsuit, you have a drysuit that looks brand new! Check out [Whitesdiving.com](http://Whitesdiving.com) for more information.

Reviewed in X-RAY MAG # 26  
[Read review here](#)



## Poseidon's Evolution

Fresh out of the oven, the image is less than 24 hours old as we closed this edition. The Evolution is the Swedish drysuit veteran's first suit with latex. The flexible and durable 3mm compressed neoprene, tightly designed around your body, will still be tight and prevent air movement and expand when you add more underwear, while remaining soft and flexible enough not to restrict movements, preventing squeeze. Use less underwear for warm waters and more for cold, preferably Merino wool, which is warm even if wet and found in the nearest sorts store at reasonable prices. Knees and backside have been reinforced with Kevlar.

[Poseidon.se](http://Poseidon.se)



## Hollis Biodry

Constructed with patented WearForce material, which is a lightweight non-woven nylon material laminated to a heavy-duty, stretchable polyurethane, the BioDry BX200 Drysuit is said to be like no other suit on the market. Strength and stretch with a complete range of motion allows for a more streamlined fit. Say goodbye to bunching and rigid material. Coming soon at

[Hollisgear.com](http://Hollisgear.com)



## Gravity Zero

Italian Gravity Zeros flagship model is the TLS Ranger Limited edition produced in flexible and soft 350 G/MQ Trilaminate fabric, which is highly resistant to abrasion. Designed with a telescopic torso with an adjustable waist, the suit provides a great degree of freedom of movement. Neck and wrist latex seals according to military grade specifications while separate hood is optional. The front zipper configuration makes the suit easy to put on and off. The inside is covered with a smooth fabric and mounted with elastic braces. The boot is made of 2,5 mm CNX neoprene.

[Gravityzero.it](http://Gravityzero.it)



## Aquata

*Trockentauchanzüge* is German and means drysuit. The Aquata

Crush, from the renowned German manufacturer of wetsuits, rescue suits, and drysuits, is made from 5mm crushed heavy-duty neoprene, which is tripled glued, blind-stitched sewn on the outside, and neoprene-taped on the inside. The horizontal back zipper is made of anti-corrosive metal and protected by a neoprene cover. The neck seal is made out of neoprene. Covered arm seals are made of heavy-duty latex, compatible with Dry-Glove Ring-System. The boots are fitted with the dry-sock system and separate protection-shoe made of 6mm neoprene in variable size. The hood is made from 6.5mm neoprene with metal-plush coating and double seals for full-face mask, hood deflator, and small collar with velcro tape for attachment to the suit. Additional features include heavy-duty knee-, shoulder- and side-protection; voluminous leg pocket; and carrying bag. Two pockets for lead. **Aquata.de**



## Waterproof D1 Hybrid

Don't be fooled by the seemingly unassuming look of the prototype above. The interesting parts are in on the inside. It may look like another membrane suit, but thermal insulation is provided by a completely new porous insulation material, which Waterproof predicts will create quite a stir among dry suit aficionados. We weren't given a lot of detail as the suit won't be formally presented until DEMA 09, but we tried it on, and it was very soft, comfy and remarkably stretchy. It will be a high-end suit, so we don't expect it to come cheap. **Waterproof.se**

## DUI

DUI's legendary CF200 has gotten a bit of a fashionable face lift. Recently, DUI has incorporated a computerized pattern design and cutting system, which allows them to make continuous changes to their patterns, so they fit better than any other drysuit in the world for both men and women. In addition to the sizing, DUI Special Production drysuits allow you to truly design a unique drysuit just for you. With a Special Production, you now get to choose your own styling. More info on **Dui-online.com**



## Otter

UK-based Otter has been around for longer than many of the other manufacturers put together, but that doesn't mean they are out of touch. Au contraire, their new Travellite is the response to the many travelling divers who want to bring a drysuit on their vacation. Weighing only 7lbs, or 3.5kg, this is a light-weight membrane drysuit with telescopic torso to facilitate the use of it's diagonal front entry zip with outer cover. To be worn with Rock Boots. **Drysuits.co.uk**



*I wish there was some way to travel with it without feeling like you're taking the house with you.*



## Camaro

The new Arctec pro from Austrian Camaro consists of a very special high-tech four-layer material, which is highly elastic and flexible. This means the suit can be cut 30-40% slimmer than other drysuits, which results in a smaller volume, more freedom of movement and higher comfort. The extra light and very thin material can be packed very small and is perfectly for trips abroad. Over the latex arm- and leg-cuffs, there are additional neoprene cuffs to build a thermal bridge, which supports heat insulation. The Arctec Pro comes equipped with Camaro's own open hood construction, which is fully adjustable for personal fit. On the surface, it can be easily opened and pulled over the head. Also brand new are the attached thermosocks, which allows the user to select the boots of his or her choice, but Camaro will fit Explorer or Classic Boot at no extra charge. Last but not least, a very important feature is the front zipper, which allows single-handed dressing without any assistance.

**Camaro.at**



## O'Three

O'Three has been the preferred brand for many of this magazine's technical dive gurus, including Leigh Cunningham and Pascal Bernabé. Their top-of-the-range Ri 2/100 has been specifically designed with the technical diver's interests paramount throughout its evolution. Hyper-compression creates an extremely dense wall of protection and ensures virtually no buoyancy change at extreme depth.

The neoprene has not been crushed, so a good degree of insulation is maintained. The resin-impregnated outer lining creates a finish that makes the Ri 2/100 extremely strong and snag-resistant.

Unlike other conventional outer linings to neoprene suits, the Ri coating is also impervious to water. This will enable the suit to dry in minutes and will reduce wind chill considerably.

**Othree.co.uk**



## Ursuk

Heavy Light Cordura RedQ has been developed by the Finnish suit specialists especially for demanding wreck diving and technical diving, where it is essential that the suit remains intact. The three layer fabric with Cordura surface is in a class of its own, with high tear, puncture and wear resistance, and a special seam technique. The ergonomically fitting neoprene hood has a face seal that allows use of either regular or full-face masks. The telescope waist of the FZ-model allows persons of different heights to use the same suit. Includes integrated suspenders and crotch strap as well as loops for hanging it to dry; knee and back reinforcements; 5 mm neoprene boots with a latex surface, which reduces the need for extra insulation; and heel strap retainers that keep the fins safely in place. The bottleneck-shaped wrist seals are made of heavy duty latex.

**Ursuk.com**

## SeacSub

SEAC drysuits are born in Italy where prototypes are designed, styles are developed and cut, and top-notch Si-tech valves are assembled under the utmost individual quality control standards. The anatomical cuts designed specifically for men and women guarantee excellent fit and optimal comfort. The 3.5 mm high-density neoprene, which is highly resistant to compression, guarantees the best possible combination of thermal insulation, fit and comfort. The exterior of the seams are blind stitched and taped on the inside with neoprene tape. The heavy duty exterior lining, the plush Helioflex inner layer, the Glide Skin collar, the Glide Skin wrists will make this suit a popular choice for the demanding diver.

**Seacsub.it**





# Under garments

One of the great things about a drysuit is that you can use it in a broad range of water temperatures. All you need to change is the insulation (underwear) you wear beneath the suit. Your insulation will vary according to the water temperature and your activity level. For example, during the summer months in Southern California, you might be able to dive with nothing more than a cotton sweatsuit underneath your drysuit. Yet, to dive the northern Channel Islands in January, you would probably want to wear drysuit underwear made from Thinsulate or Polartec, which provides substantially more insulation. Wear too much insulation on a dive during the summer, and you'll overheat. Wear too little insulation on a dive in the winter, and you'll be cold. You must learn to adjust your insulation and the amount of weight you wear with it, from dive to dive.



The outer layer in **Fourth Elements Ozone** undergarment complements their Arctic, Xerotherm and Drybase as part of a complete thermal protection system. Windproof and waterproof, the Ozone layer is designed to be worn over the Arctic and/or Xerotherm to provide additional warmth, and to provide weather protection before and between dives. The soft shell outer fabric has been developed to maximise warmth for very little additional bulk, and the system of vents ensures management of air within the drysuit is not hindered by the undergarments.

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



The **Oxygen undersuit from Weezle** comes in two parts the O1 and the O2. Developed in conjunction with Fraser Bathgate at the IAHD, Weezle has produced a two-piece Undersuit with which it is possible to order top and bottom sections in two different sizes.

The O1 is a jacket lined with their TS1 and fitted with a crotch strap system to keep it in place, worn over the top of the lower part. The lower section is the salopette style O2 trousers, also fully lined, making them suitable for use with most styles of drysuits.

[www.weezle.co.uk](http://www.weezle.co.uk)



**Titan** undersuits from Glasgow, Scotland-based Lomo Watersport are high specification diving undersuits made of a three-layer sandwich of material consisting of an outer windproof shell, a 100g thinsulate core and a 150g polar fleece inner material. This sandwich provides great functionality both in and out of the water. The fleece lining is extremely comfortable and complements the Thinsulate core extremely well.

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



Ursuk's **X-TEX/Finnfill** underwear is elastic, watertight and manufactured in a four layer material, with Finnfill fibre as insulating layer, and breathable watertight X-TEX membrane as intermediate layer. The surface is of elastic and slippery tricot fabric, and the inner lining of fleece. The suit features are front zipper with double locks, chest pocket with zipper, large hip pockets, elastic fabric in the collar, cuffs and legs, thumb and leg retainers and strong elastic waist band

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



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Waterproof is about to introduce silicone seals as an alternative to latex. There are several advantages to this material. It is medically inert, something divers with latex allergy will surely appreciate, but above all, it does not tear easily, like latex does. And, relax, it will be available in a range of different colours other than this rather skanky hue

We didn't get a name for this fancy material we saw at a leading dry suit manufacturer in Sweden. This ultra-light honeycomb structure material is seen as the future in thermal insulation of drysuits. It doesn't compress laterally, and the hollow structure even allows for a more even and less restricted distribution of gas in the suit—a boon if you use Argon for suit inflation. We tried the prototype suit, which was a neoprene type. It was very comfy, stretchy and very easy to get in and out of. The suit will be revealed at the 2009 DEMA show



# Fresh thinking

Jacques-Yves Cousteau in an early drysuit. No vavles, no zipper. Donning and doffing was done by crawling through the neck seal



No more cold water rushing in around the neck! The idea behind this innovative neck seal from Waterproof is to prevent the hood from gaping when the diver looks down by having it already stretched over the flange



SI Tech Necktite, could turn the potential disaster of a torn neck seal into a mere inconvenience, saving you time, money and possibly some dives. The lower ring has to be fitted on the suit either by the manufacturer, or be retro-fitted the next time your suit goes in for repairs or seal replacements



Another SI Tech innovation is this boot connection system, which lets the diver quickly change boots, or go for another size, easily without alot of work. The suit will need a corresponding connector





## A visit to Ursuk

# Where drysuits are manufactured

Andrey Bizyukin recently paid a visit to the Ursuk dry suit factory in Finland and had a look behind the scenes before trying out some of their products under demanding Finnish conditions.

Ursuk's managing director Marko Kallionpää deeply engaged in a discussion of the design of a new suit

Finnish company Ursuk Ltd has been manufacturing dry suits for 40 years. "Right from the beginning we have focused solely on dry suits, and do not produce protective suits at all," explains Marko Kallionpää, the managing director.

According to Kallionpää, there is an important distinction between floatation suits, diving suits, and survival suits. Floatation suits and wet suits let water inside the suit, which under cold conditions, quickly leads to decreasing body temperature. Therefore, the technical quality and protection these suits can offer is inadequate for demanding conditions and professional use.

As a manufacturer of waterproof suits, Ursuk Ltd.'s long history has given a whole new basis for product development. Once 100 percent waterproof items became more commonplace, Ursuk Ltd was able to move its focus from mere protection against cold water, to ergonomics and clothing. People dislike clothing that doesn't fit, and the same applies to dry suits.

Intensive product development has made vast improvements to survival suits. Not too many years ago, a dry suit was used only for special situations and emergencies, and the suits were quite uncomfortable, and among recreational divers, they were a rare and expensive luxury. By contrast, a modern dry suit can be worn constantly, as a part of normal

working clothing, thanks to breathing materials and other modern fabrics.

### Rise to fame

Rising to a leading role as a manufacturer of survival and diving suits didn't happen by chance. Just 10-15 years ago, Ursuk Ltd had an image of manufacturing reliable but traditional products. When new product development was initiated in the 1990s, Ursuk Ltd could already offer a dry suit solution for any conceivable need.

But it was a breathing and waterproof survival suit that firmly established the company's position among professionals. The growing popularity of fast RIB boats in professional navigation led to an increasing popularity of survival suits, because to the professional navigators, a survival suit is an obvious solution.

When missions don't require working under the surface, a breathable but still fully waterproof survival suit is a more useful choice than a suit designed purely for diving. The breathable fabric of a survival suit also keeps the user dry from moisture coming from inside the suit, which is important during long working hours. Sea rescue officials, military and semi-military personnel working close to water, and flight crews working in variable conditions have become users of survival suits.

"In a test conducted by one of our customers, a basic model survival suit made out of Gore-

Tex was worn for 12 hours in field conditions (completely immersed in the water) where water temperature was +2°C, and there were no symptoms of hypothermia or lack of working order," Kallionpää clarifies. "Without a survival suit, he could probably have survived for only 30-60 minutes. So, in very extreme conditions, a survival suit is really helpful," he added.

Today, the line of survival suits covers about 20 different models in all sizes and various colours. Even though their standard suits have proved to be good, and they have been made in large production series, all customers have different needs and expectations. When these needs and expectations are to be met, suits are modified for each user group, because the demands can be very different—for example, a fighter pilot flying Mach 2, compared to a rescue officer in a storm at sea.

### Commercial standards

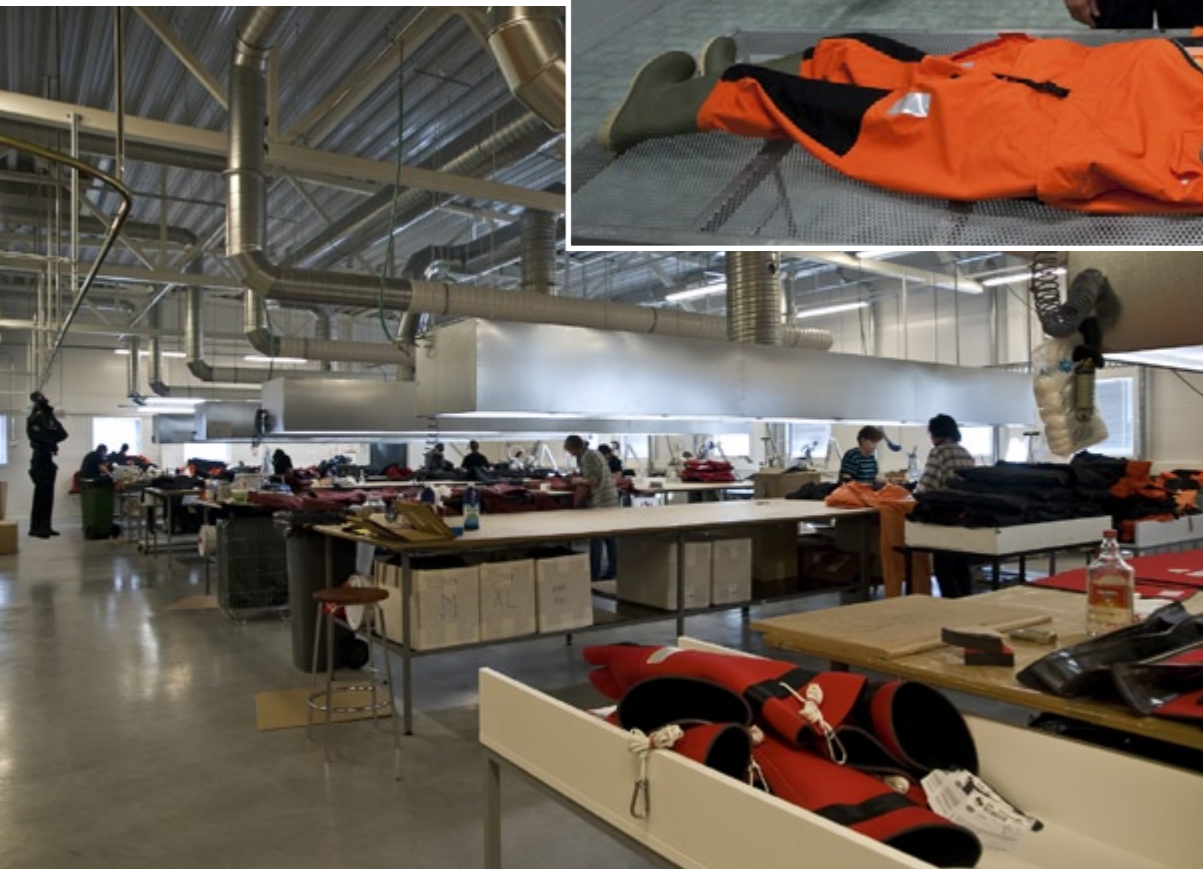
Ursuk Ltd then focused on developing drysuits for professional groups with special requirements such as police and special forces.

Their needs are quite very different from other professional groups due to the relatively high amount of work done above the surface. Ergonomic demands are also high due to the nature of difficult missions. The model range which was developed over many years in close collaboration with professional divers lends itself naturally to demanding sports diving.

Text and photos by Andrey Bizyukin, PhD  
Edited by Peter Symes



Marko Kallionpää demonstrates how each Ursuk suit is individually tested before leaving the factory



Thousands square meters of manufacturing halls are filled with production lines for many kinds of dry suits. Ursuk is entirely a Nordic manufacturer

BELOW: The Ursuk factory headquarters



Andrey Bizyukin tries out the Heavy Light Cordura RedQ in the Finnish archipelago

Almost all production of diving suits takes into consideration different conditions and optional equipment and are therefore often tailored to meet customer needs said Kallionpää.

Ursuk currently produces seven models of dry suits for sport divers up to professional diving. All Ursuk dry suits comes with a fixed hood, which the company believe is a better solution, stating it is more comfortable and warmer under water.

According to Kallionpää, the volume of production in the manufacturing plant in Turku, located in the west coast of Finland, has been rising strongly in the past few years, which supports Ursuk Ltd's vision of customer satisfaction and success in product development. Before leaving the factory each suit is individually tested and provided with a factory warranty.

### The proof is in the pudding —diving the suit

I went with the 'Heavy Light' drysuit model and Finnfill underwear for a few days of diving in the Finnish archipelago. The drysuit fabric was soft and had a pleasant feel to it. Even the standard size fit me very well, and it was flexible and allowed for freedom of movement in all directions, in part, thanks to the telescopic torso. The fixed hood was very comfortable and fitted perfectly due to good design. The front zip, which sits protected under another outer protective zip, was easily zipped without any assistance needed from a buddy. The heavy duty seals looked reassuringly reliable.

After a week of diving in the cool Finnish water, I was very pleased with the

suit. I never had a leak, I was never cold, and I never felt restricted in my movements. Both the boots and the fixed hood kept me perfectly warm at all times, perhaps not so surprising since all Ursuk suits

are made for diving in cold Scandinavian waters. I liked the bright red colour, too, which I think looks great oin photographs.



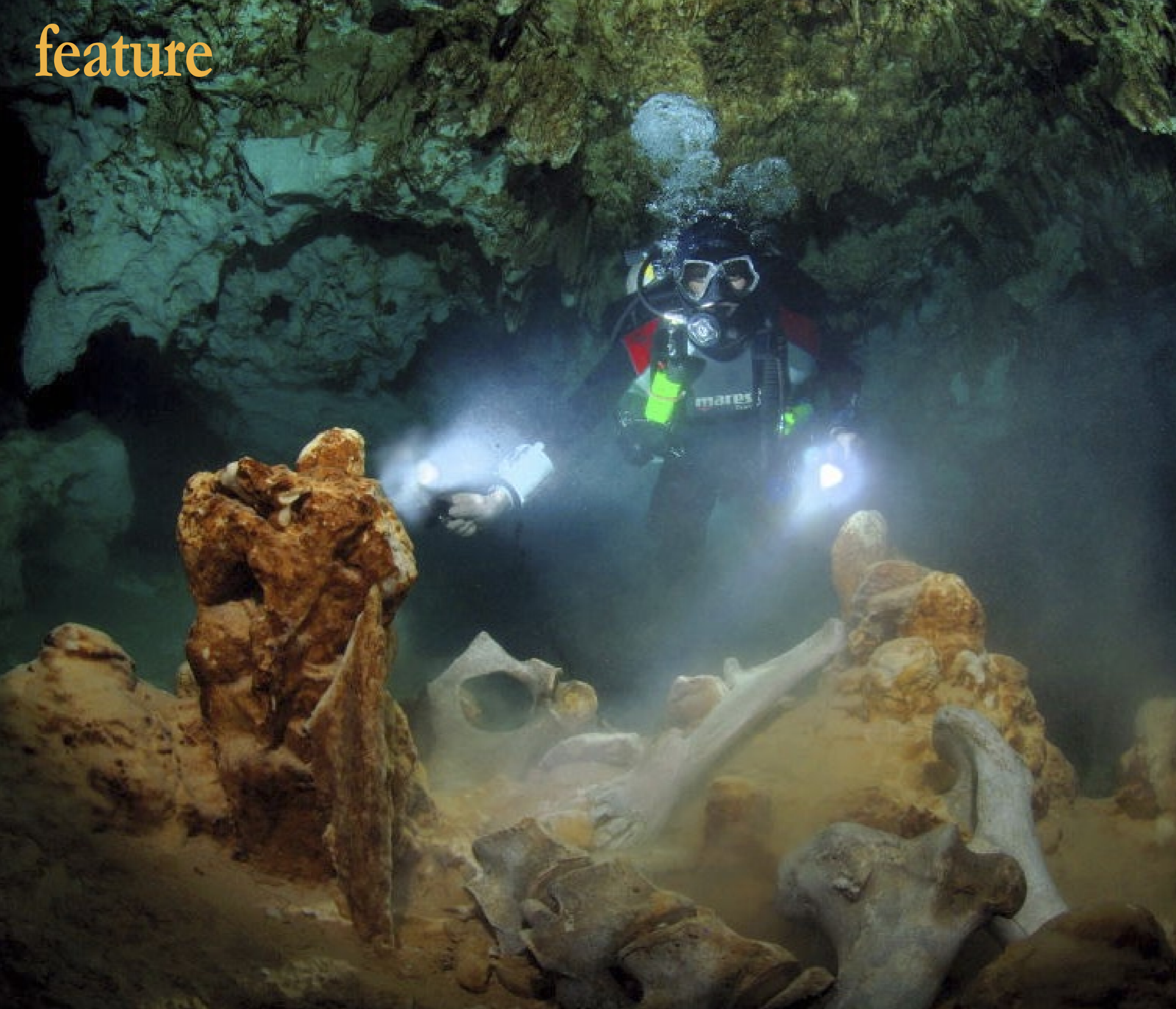
Ursuit diving dry suits can be divided into three major groups depending on the usage:

- Surface rescue and combat missions. The material and details of the suits are designed to ensure maximal operating ability. Surface rescue missions require visibility in dark and often rough sea conditions. This important factor has been witnessed in many operations, such as the Estonia rescue mission.
- Training missions, demanding great durability, for instance field practice, occupation exercises and heavy work diving. These work missions demand great durability together with ergonomic qualities. The material used are resistant to abrasive and sharp surfaces such as metal objects inside a wreck.
- Dirty and contaminated conditions. Different occupational groups must sometimes work in contaminated and/or very dirty conditions such as harbours, possible oil leak areas or during shipwrecks. This group has its own material and model range. ■

# Finding the early humans

*Discovery of prehistoric remains in the Yukatan*





Yucatán

Text by Paul Jeffrey  
Photos by Kurt Amsler

**Mexico's Yucatán Peninsula is a relatively flat landscape where no rivers flow for the rain sinks quickly into the limestone and runs unseen to the sea. The ground is pocked by vine-draped sinkholes—*cenotes*, as they are called locally—where the roofs of underground caverns have collapsed. For centuries these openings have provided inhabitants with access to fresh water, and the inaccessibility of the deep caves beneath the openings has long beckoned the adventurous, though physical challenges limited how far they could go.**

In recent years, however, technological developments in underwater

Many prehistoric remains in the submerged caves of Yucatan have been discovered by González's project, such as these bones of extinct horse and camel species





THIS PAGE: Arturo González and colleague Carmen Rojas investigate the caverns in the Dos Ojos cenote for archaeological remains. At 60km long, it is one of the longest underwater cave systems of the Yucatan peninsula

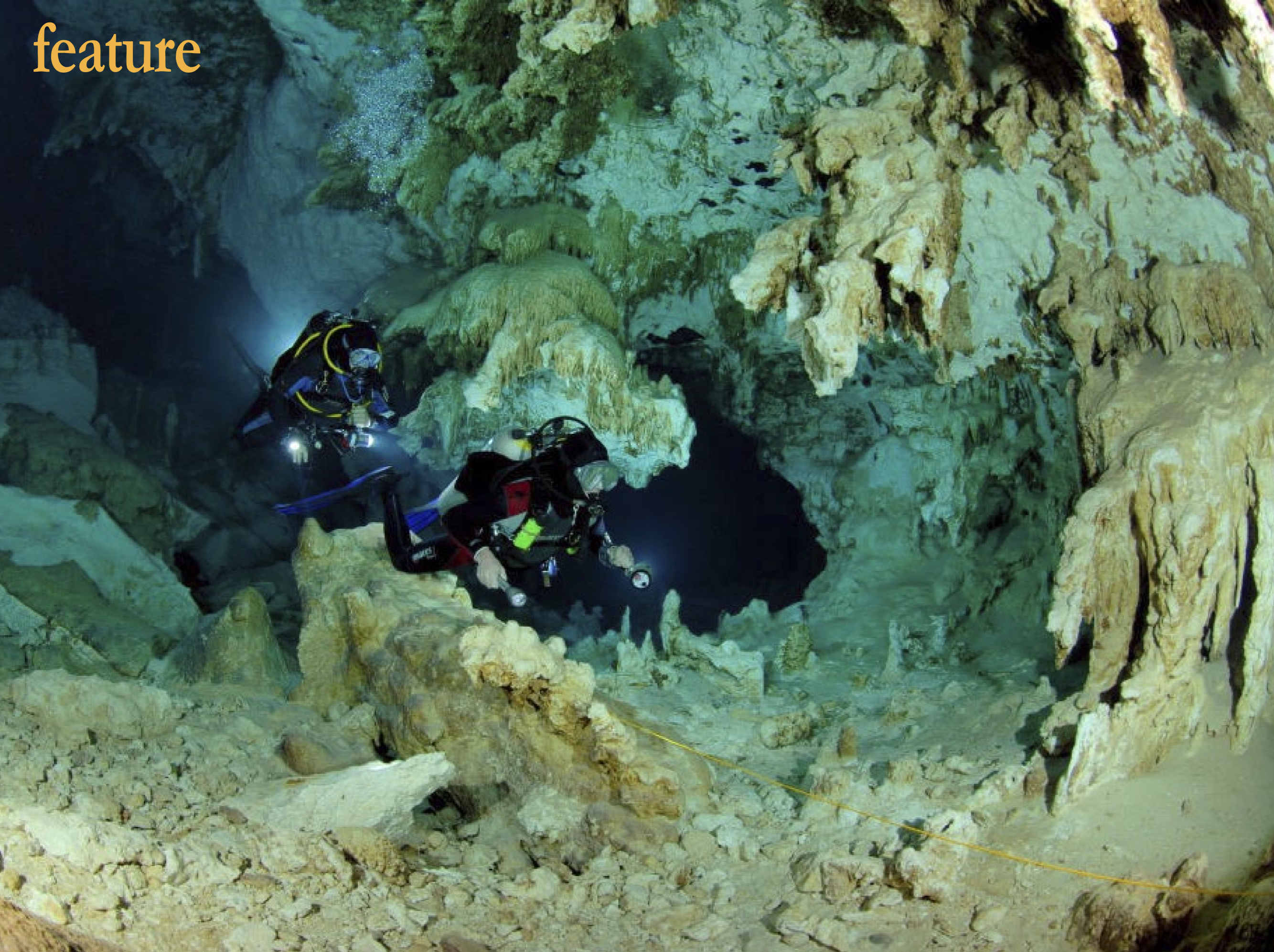
equipment have made it easier for divers to go farther into the networks of dark tunnels branching out from the submerged caves, and reports began to emerge about this dark underworld and its store of human and animal remains.

Arturo González, a Mexican biologist and underwater archaeologist working with the Instituto Nacional de Antropología e Historia, decided to launch a systematic examination of the flooded caverns in 1999. He worked together with a team of specialists including cave divers, archaeologists, palaeontologists and photographers, who would face technically difficult and

physically challenging dives of up to six hours. The multidisciplinary team excavated three human skeletons from the depths, then carefully studied and analysed them. What they found startled the scientific community.

The skeletons are possibly older than any other human remains in the Americas. One in particular has been estimated by three foreign laboratories to be more than 11,600 years old. Furthermore, the skeletons bear no resemblance to the Maya who came to dominate the region thousands of years later, and whose remains and artefacts are found near the openings of the cenotes. If anything, accord-





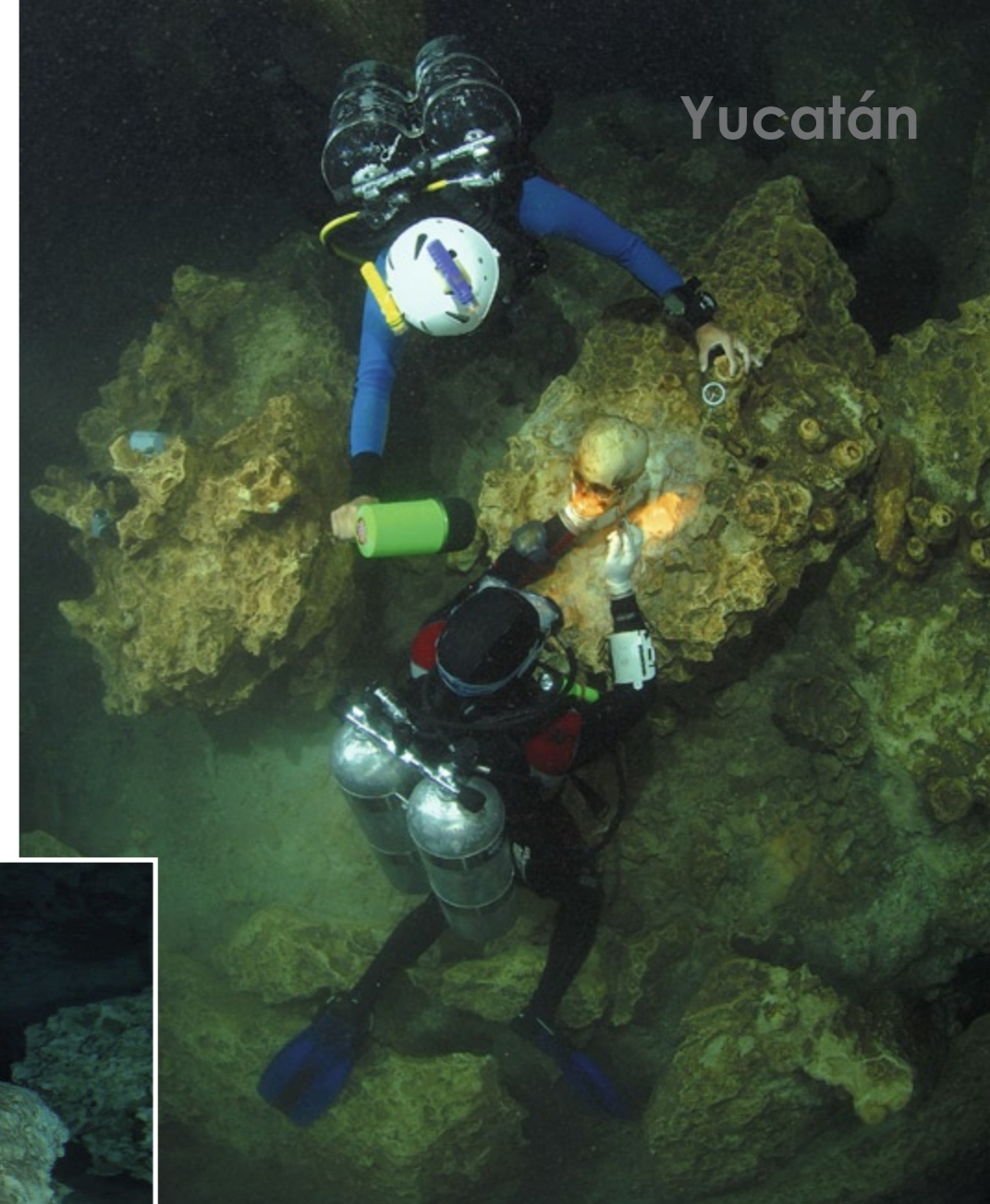
ing to González, the newly discovered skeletons have a cranial morphology resembling that of people in eastern Asia. The findings are forcing the scientific community to reassess its theories about when and how early humans travelled to the Americas.

"What we've discovered is a piece in the puzzle of human evolution," says 44-year-old González, who has been director of the Museum of the Desert in the northern Mexican city of Saltillo since 2002. "But there are a lot of other pieces missing from the puzzle. We have one important piece, but it doesn't match any other existing part in a way that would help us understand how early humans colonized the Americas."

González first learned scuba diving as part of his university studies on biology, but it was a National Geographic documentary about the discovery, by underwater explorer James Coke, of an ancient fireplace 30 metres below the surface that inspired him. "For me this was unbelievable," says González. "Caves have always interested me, this space below the ground that for many indigenous groups signifies the mother's womb. When I saw this documentary about fire pits under the water, I began to travel to these areas to explore them. We got to know James Coke, a pioneer in the exploration of these spaces, and he alerted us to other discoveries he'd made. Thanks to him we began to form a project that since 1999 has been making important discoveries about the ancient history of the Americas."

Arturo González and colleague Carmen Rojas explore the vast caverns of the 60km-long Dos Ojos cenote





## Cave exploration

Cave divers and speleologists have been exploring Yucatán's submerged cave systems since the 1980s, collecting geological, archaeological and palaeontological evidence that is now crucial to González. Deep in the caverns, González and his colleagues retrieved fossils that are between 10,000 and 60,000 years old, including those of extinct camelids, giant armadillos and horses. All are from the Pleistocene Epoch, when the Yucatán was covered not with low forests but with dry grasslands. In at least one submerged cave north of Tulum, near the Caribbean coast, the divers found another ancient fireplace, whose carbon traces of partially burned camelid bones suggest that the prehistoric humans there survived in part on the meat of an animal whose species disappeared at the end of the Pleistocene.

When prehistoric people were cooking camelid meat, the sea

level was more than 100 metres below where it is today. González believes these people may have used the caves not only as rudimentary kitchens, but also as pathways to water sources. There is also strong evidence that dead bodies were placed in special caves far below the ground, perhaps to protect them from natural predators. But then a massive shift in global climate produced rapid rises in the sea level, as well as the intricately linked water table inland, and the burial sites and kitchens were all flooded – to remain unseen until cave divers discovered them millennia later.

## Rolex funds research

Funds from the Rolex Award will allow González to field a team for at least another year of research; the group intends to focus on the Chan Hol cave, where a fourth skeleton has been discovered, but not yet removed or analysed. The more skeletons examined, González says, the



ABOVE: Using an underwater compass, González records the exact position of camel and horse fossils in a cenote. Their study will broaden the knowledge about ancient fauna, environment and climate. TOP RIGHT: Several dives and meticulous archaeological work were needed to properly excavate the bones found in cenotes, such as this skull dating from the Maya period. RIGHT: A skull from a cenote is recovered by González. Several hundred metres from the cave's entrance, human skeletons were found. The finding suggests that they were intentionally deposited at a time when the caves were dry, about 10,000 years ago





Yucatán



more comparisons can be made to similar human remains in other parts of the world—perhaps even putting more pieces into the puzzle of human history. Beyond that, González says he and his colleagues will focus on trying to understand the lives of these ancient people, especially how they used different caves for different purposes—clues that will lead researchers to move beyond the bones and toward a better

understanding of prehistoric life. These findings have greatly increased interest in the cenotes, leading González and his colleagues to work with residents of local villages to protect the rare treasures from damage and looting. They have also encouraged the villagers to speak out against the contamination of the underground waters by unrestrained tourist development along the so-called

Mayan Riviera. Cenotes hold vital freshwater reserves, yet millions of litres of water are pumped from these aquifers every day, far exceeding their natural regeneration rate in some parts of the peninsula. In remote areas, cenotes are sometimes used as waste dumps that spread organic and chemical pollution.

As knowledge of the past increases, the challenge of getting in and out of the twist-

González and his team made several exhausting dives in Yucatan's cenotes in order to bring submerged archaeological remains to the surface to be studied and preserved



González and his team found human remains in Yucatan's cenotes that provide new insights into early human settlement of the Americas

ing labyrinths remains a dangerous pursuit in the name of science and discovery. With complicated logistics and multiple equipment combinations to minimize the risks, the long and disorienting trips underwater remain physically and emotionally gruelling. A typical underwater expedition can take six hours, including the first hour to reach the cave of interest, an hour to carry out research, and then, given the need for decompression stops along the way, a four-hour return trip to the surface. Fortunately, the scientists are assisted with this aspect of their work by a small cadre of highly trained, professional divers whose knowledge of the systems is a precious resource.

Many years of work still lies ahead for González in what, according to Prof. Wolfgang Stinnesbeck, specialist of Mexican geology and palaeontology at the University of Heidelberg, "is certainly one of the most fas-

inating and outstanding research projects in modern geosciences and has already delivered an impressive number of outstanding results". And it's a race against time given the Yucatán's burgeoning tourist development. Yet for González, the risks the divers take as they plunge into the watery windows on the past are worth the challenge.

"As an inhabitant of the Americas, I'm interested in knowing who these people were, where they came from, and when their first steps in the Americas occurred," he explains. "In these sites, we can find the archaeological contexts just about as they were left by the people of the Ice Age. It's a great treasure and it's my passion to get there and discover them, and be able to interpret them in order to share a new understanding of the history of humanity." ■



González and colleague Flor de María Curiel, in a field laboratory he established in the jungle, carry out a preliminary study of two human skulls brought out of a nearby cenote

BELOW: Alejandro Terrazas Mata (left) and Guillermo Acosta of Mexico's National Autonomous University (UNAM), and González (centre) discuss three skulls found in Yucatan's cenotes



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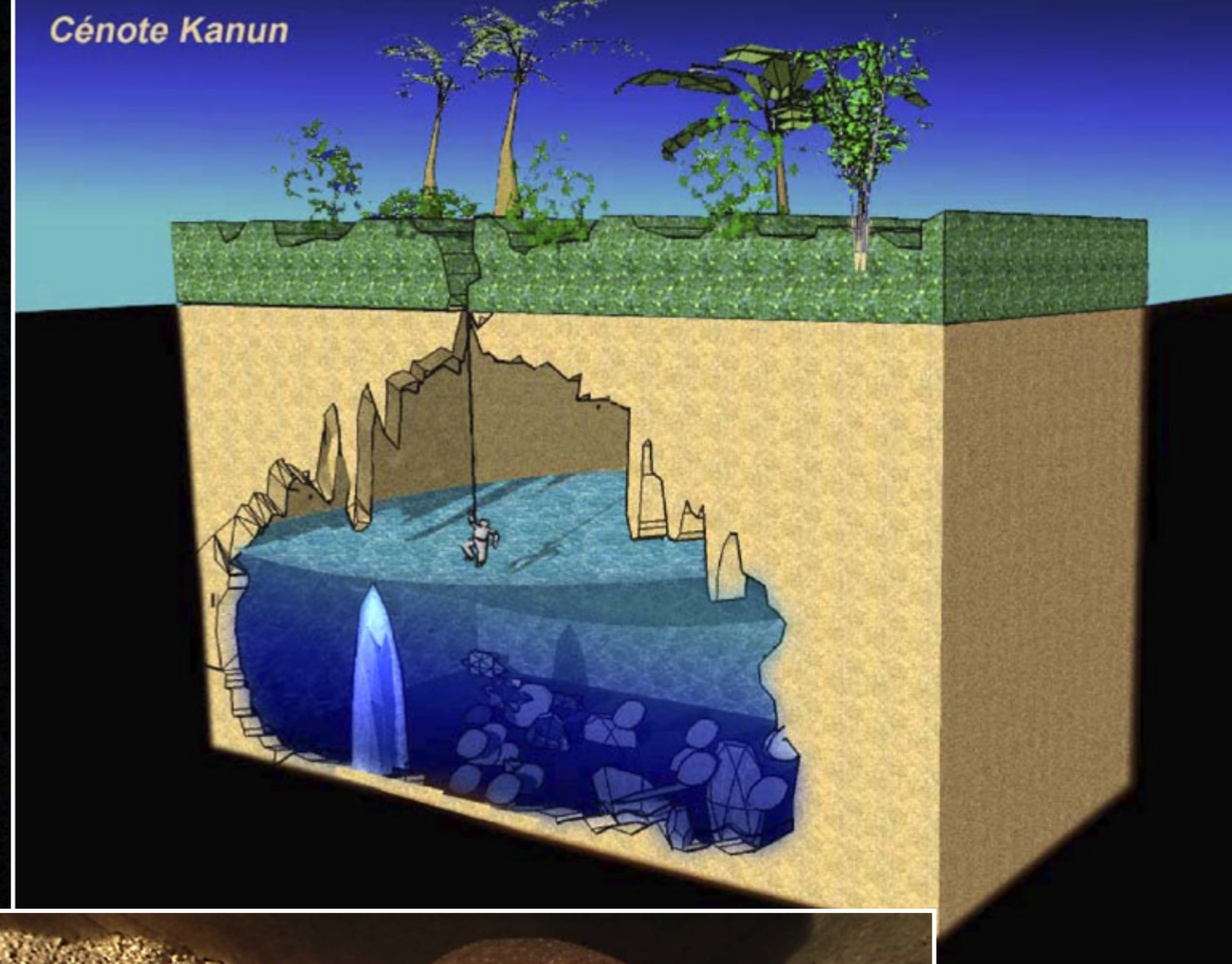
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# Axis Mundi

*The making of a movie in the depths of Yucatán's jungle*

Text and photos by Nathalie Lasselin, director of *Axis Mundi*

The Yucatán peninsula is mostly known for its Riviera Maya and its all-inclusive package trips that allow tourists from colder climates an easy escape from their dreary winters. Cancun airport is the usual arrival point for these masses including those who have opted for one of the now several “Riviera Maya” packages that combine relaxing and diving on coral reefs with the opportunity to discover, or

get introduced to, cave diving in the world famous sink holes known as the cenotes.

Those that leave the coast will often head towards Chichen Itza, with the famous Maya ruins. We are heading in the same direction as we set out on our Yucatán 2008 expedition, but in our case, we go right past Chichen Itza and head further inland to a tiny village named Homun, which is located in the very middle of the Yucatán jungle, a four hours' drive by car from Cancun.

Here, our hotel turns out to be a 400-year-old church where we

could set up hammocks and rest protected from jungle life.

Before that, detailed logistics and preparation had us put in our luggage all that we might need during our journey. The trip groceries were acquired in Cancun.

The program lying ahead of us was the documentation of the cenotes, wells and caves in the region. For over ten years, our team leader, Curt Bowen, has been returning here, meticulously combing through the area and following trails, looking for new cenotes to explore. In addition to searching for new caves, this year's expedition was also about shooting a film *Extreme Diver*, a US-Canadian co-production



CLOCKWISE FROM TOP LEFT: A diver confronts the giant stalactite of Karril; Cross-section of Cénote Kanun; Human skull found in a cenote

## Go back 100 times to get the job done

cenotes are not big open spaces with high ceilings often depicted in photographs, but wells—mere holes in the ground, or other small orifices—which sometimes reveal niches full of artifacts.

Once on site, we checked if the cave had been explored before. It was a great help that known cenotes were now marked with their GPS coordinates, because without this, it would be impossible to keep track of every water-filled hole explored.

On every trip, we visit more than 60 holes. It's difficult to remember them all, especially as ravaging hurricanes and overgrowth can change their appearance from one year to the next.

If the cave turns out not to have been explored before, we assess the rappel depth that will need to be performed and get out the boxes with ropes, harnesses, helmets and diving equipment.

Every site needs to be analyzed in detail in respect to how we are going to secure ourselves. Not only do you have to be sure that the branches or stones that we use to secure

Filming puts divers in lots of awkward places and positions; Lodging for the night in hammocks in a 1,000-year-old church; Local cultural site; The descent

ourselves are strong enough, but also one must check that there is no biting or stinging wildlife in the way. Despite this, our topside cameraman was stung by Popoche (a plant that causes skin reactions). But that goes with the job when one has to stand in all those places in order to shoot film.

Usually Enrique and Elmer, our local guides, would open up a passage with their machetes, and we would keep on the marked trail, or have our eyes wide open if we strayed off the trail.

If Popoche only causes an unpleasant tingling like poison ivy, it is nothing in comparison to what happens if you get too friendly with the Chechen tree. In 2006, a stranger got the brilliant idea of having his picture taken while embracing a Chechen tree. Immediately, he developed a cirrhosis skin rash.

Norma, a Mexican archeologist who relayed the story to us, saw the man again a year later, and his skin still had not regained its original color. However, nature is wise and an antidote is usually close by. The challenge is to recognise it and know how to use it.

### Going down

We were now set up close to the well, and the ropes were in place. Next, somebody went down to scout and report on the cave appearance, the water and the type of artifacts—if there were any—and also whether the cave warranted a more in-depth exploration or not.

Different techniques were used for this first exploration. The first was called "power snorkelling", which is, in fact, the use of a sling tank that allows us to briefly visit the cave. If



Axis Mundi

between ADM and Pixnat.

The only way to discover new caves is to take new roads and follow the directions of the locals to any water source that may have not been explored before, and then, send in the first diver. Most



the water surface is in a dry cave, the explorer will check it while breath holding.

Brett Hemphill used this technique several times. We were filming and waiting for him on top of a rock. We could only hear him breathing, quickly hyperventilating before diving, and we were waiting for him to come up to hear his report.

Silent seconds went by. How long could he hold his breath? I had no idea, and as I could not see the water surface, I could do nothing but wait passively. When he finally emerged, his fast breathing concerned me. I asked him right away if everything was all right. He regained his composure and came climbing back up the rock. Obviously, something had happened.

The cave was really very small, and there was a restriction right after the entrance. He tried to go



Human bones and sometimes animal bones are found in cenotes

BELOW: Diver rappels down a tight well

through, but his climbing harness got stuck in the restriction. He was able to detangle himself, but the exploration report was clear. The cave was too—small no exploration was possible.

If Brett did not push for further exploration, I was not the one who would push the issue either. Brett is one of those people who would bring a shovel to open up a passage if necessary. He is an expert

of *no mount* and small passages, and he is used to going close to his limits and sometimes beyond.

### Karril and the giant stalactite

The challenge in this type of exploration is not always the diving as such. Given the limited resources available in this remote area, all dives had been conducted in sidemount, on air with 80 cubic



feet aluminum tanks, which doesn't really meet the requirements for an hours' dive.

When I would go down to film, I was usually the first one in the water out of a team of four divers. Two divers were filmed, another diver took care of the lighting, and I carried the camera housing and additional lighting.

### An unforgettable dive

When we arrived on the hacienda property where the cenote Karril is located, we stopped our vehicles on the side of the dirt trail. From there, we had to carry the equipment for roughly 700 meters to get to a hole in the ground, which was only one meter by 60 centimeters wide.

I slide into the hole, while looking out for the snakes that sometimes dwell there; it was a vertical descent of more than 15 meters before touching the water surface.

The walls are covered with hundreds stalactites of different sizes. The ceiling is full of bats.

Once we got into the water, feet first, the long dive began. First, we put our fins on and

detached ourselves from the ropes. Then, we started 'the rope dance'—one tank, then another, a diver, then a tank, then another, and so on, until the whole team, the tanks, the lights, and the video housings were in place. This underwater choreography had been rehearsed many times on the surface.

We found ourselves in front of probably the biggest stalagmite in the Yucatán. It was impressive to stand in front of this marvel of nature. A little bit deeper, around 35 meters, we discovered a complete human skeleton lying on its side. Its position showed that the cause of death was not drowning, but that the body had been thrown into the water after death.

There are many human skeletons, as well as some from animals, in the cenotes, in addition to pottery. Some artifacts are clearly Mayan offerings, but that is not the general rule.

The darker a skeleton is stained, the older it is. Some of these skeletons may be more than 1,000 years old. Pottery has been dated to 250 to 900 BC. In Mexico, it is absolutely forbidden to move or

collect any artifacts.

The database compiled by the team is recorded in an annual book with pictures, maps, reports of each explored cave, and the information is shared with government agencies like the INAH (Instituto Nacional de Antropología e Historia).

After an hour of filming the majestic stalagmite and the nearby artifacts, it was time to get back to the surface and get the equipment and the divers out. When I was finally back on terra firma, four hours had gone by.

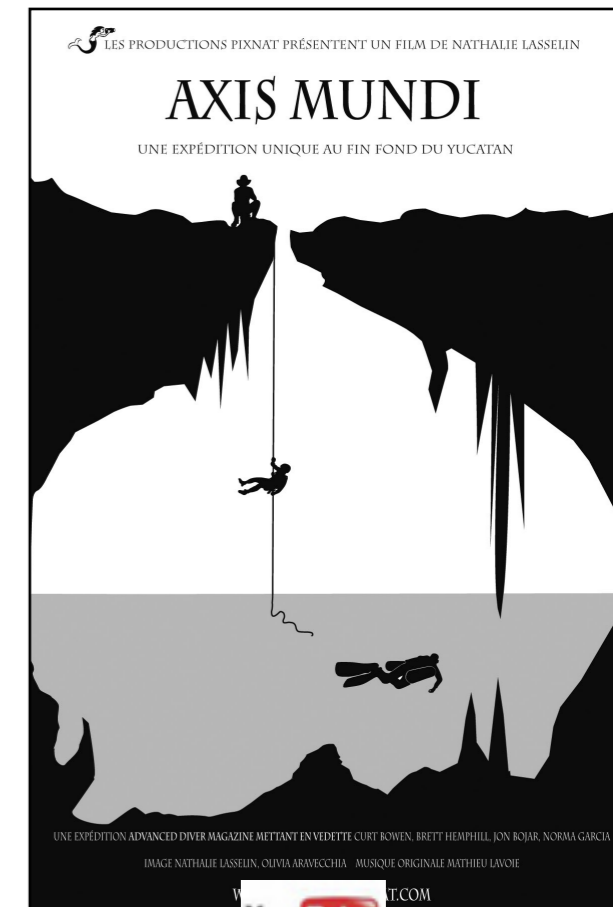
Water temperature was comfortable at 25°C and a 5 mm wetsuit offered optimal protection without interfering too much with movement on the rope.

It was time to put away all the equipment and to walk back to our vehicles. We kept the topside camera not far away from the hole, in order to be able to film the bats exiting at dusk.

Another long day of exploration had come to an end, and within the hour, we would be back in Homun. We rinsed our equipment

Click on YouTube button to see the trailer

## Axis Mundi



and hung it to dry, and then we took cold showers.

We had to use an anti-tick dog soap and inspect our bodies. The ticks are everywhere in the jungle, and every day, we had to get them off our skins.

I was finally clean, and the dinner bell rang. Tonight, we would have rice and red beans—a real treat that we alternate with spaghetti.

The 2008 expedition ended with no accidents or illnesses. New cenotes were listed and documented. The highlights of this expedition were, without a doubt, the giant stalactite of Karril, the extraordinary meeting with the Mayan people, learning about their culture, and diving in an absolutely fascinating environment. ■



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# Shark Lovers Only

*Gifts that bite*



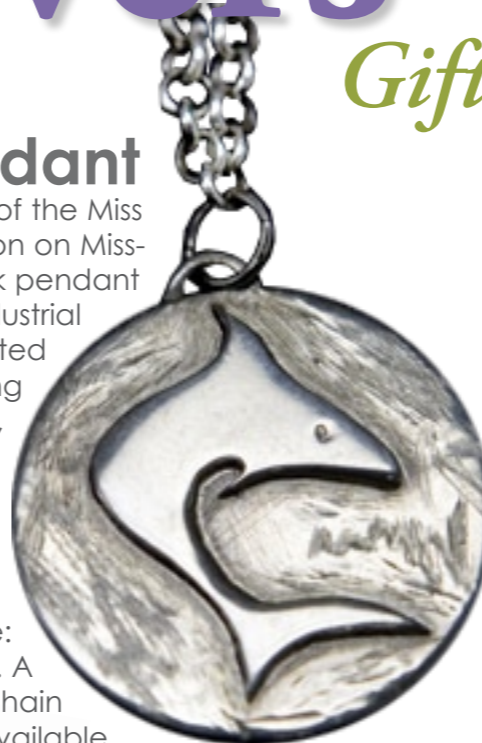
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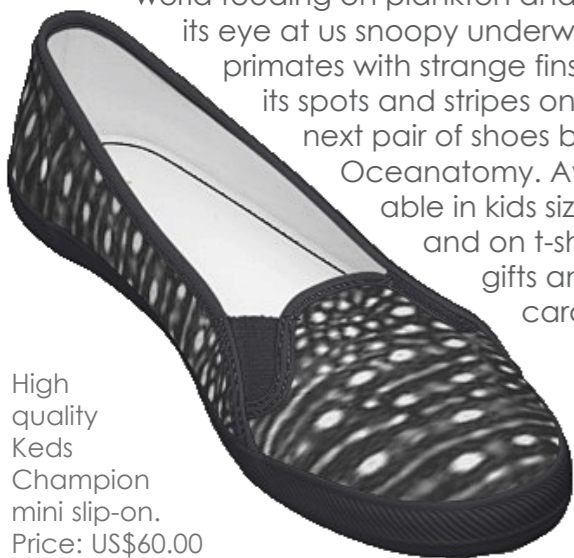


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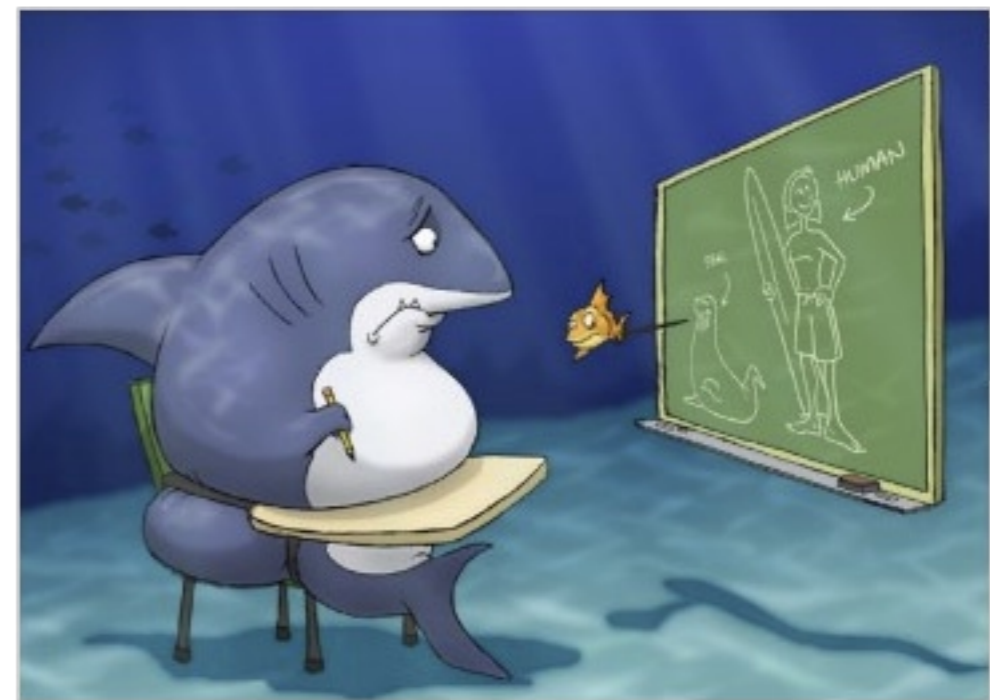
High quality Keds Champion mini slip-on. Price: US\$60.00

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## Chomp! Chomp!

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## Shark School

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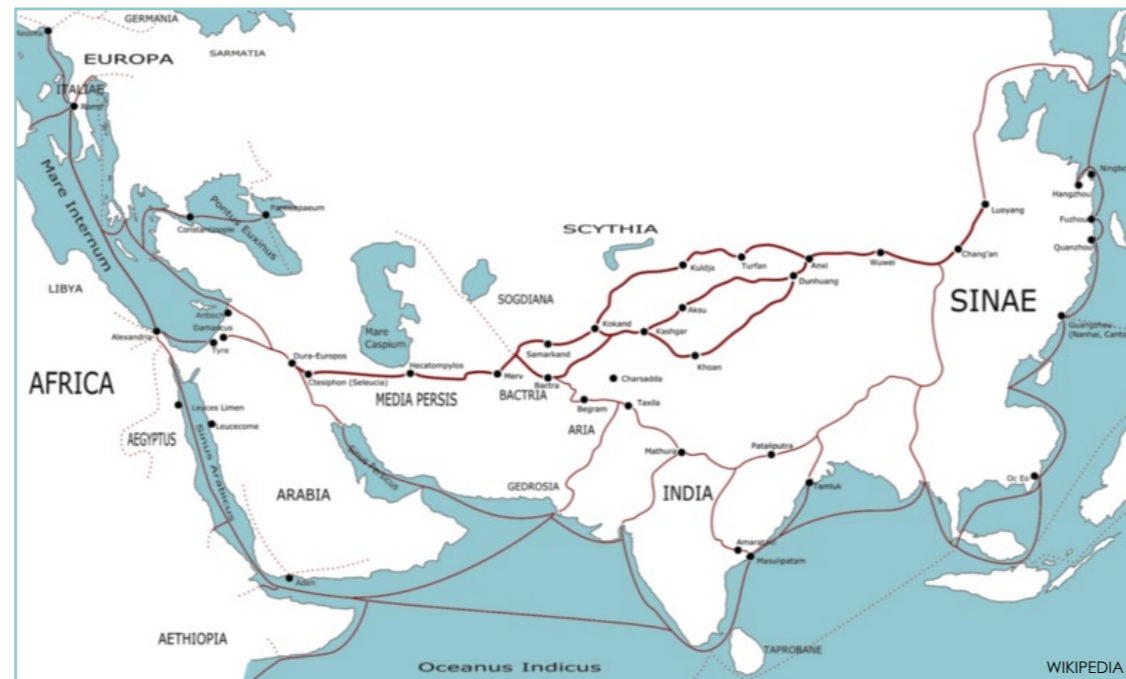
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Edited by  
Bonnie McKenna



First century trading routes centered on the Silk Road, circa 500 BCE - 500 CE

## Trade Routes for Tortoiseshell

Prized since ancient times, the tortoiseshell trade has flourished across continents and across the seas. Since 1700, the Japanese have been famous for the world's best tortoiseshell or bekko artists.

Marydele Donnelly, director for Caribbean Conservation Corporation, reported that during the past 100 years, millions of hawksbills have been killed to supply the markets around the world with tortoiseshell. The wanton killing of the hawksbill turtle has had a devastating and enduring effect on the world's hawksbill populations.

The largest market for bekko in the 20th century was Japan. From 1950 to 1992, Japan imported approximately two million hawksbills—more than 1.3 million large turtles and 575,000 stuffed juveniles.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) came into force in 1975. In 1977, it prohibited trade in tortoiseshell among the signatory nations. As trading nations ratified the convention, the volume of trade diminished.

Japan took an exception to the ban and did not stop trading for several more decades. By 1992, international pressure forced Japan to halt their trade in tortoiseshell. Japan continues to try to re-open the international tortoiseshell trade. In 2007, Japan announced that it would continue to fund the bekko industry for another five years.

Despite progress in reducing the trade in tortoiseshell, hawksbill populations have not stabilized nor begun to recover. ■

## Turtle eggs still on the menu in Malaysia



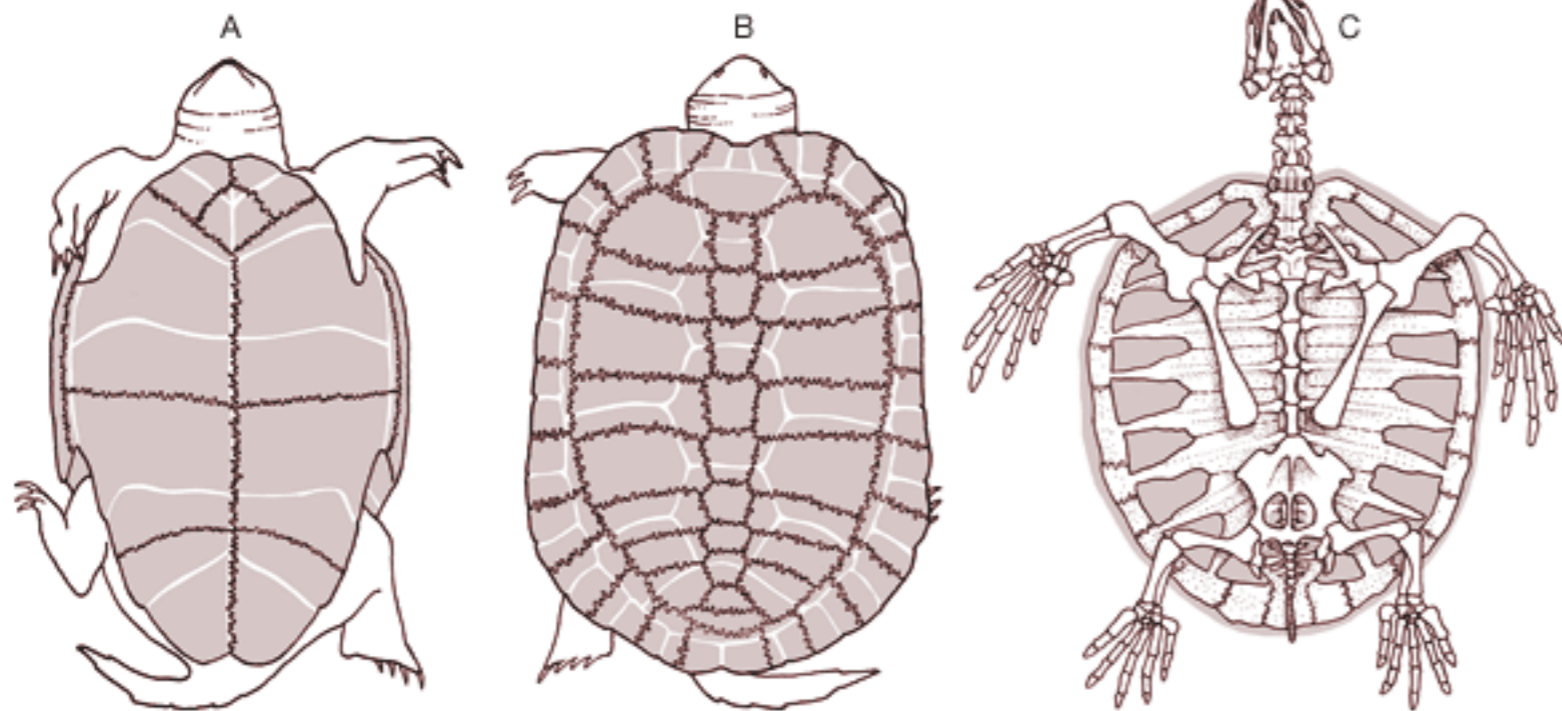
The World Wildlife Foundation has launched a campaign to stop Malaysians from eating sea turtle eggs. WWF's five-month campaign aims to collect 40,000 signatures from Malaysians pledging to stop consuming the eggs and halt the trade in turtles and their parts. A spokesman said that some 10,000 leatherback turtles used to nest in northeastern Terengganu state, but this has now been reduced to less than ten a year. Authorities are now patrolling the beaches near hawksbill nesting sites in southern Malacca state after 4,000 eggs were stolen. Under Malaysian law, it is illegal to collect turtle eggs without a permit, but the demand for turtle eggs in Southeast Asia continues to drive the illegal trade. ■

## Police in Vietnam free hundreds of sea turtles

Vietnamese police removed 849 turtles from a fish-farming cage from a man who was illegally raising them. The man bought the sea turtles from fishermen in the city of Nha Trang, raised them to maturity, and then sold them for their meat and shells.

International wildlife and trafficking organizations said it is illegal to raise or sell sea turtles in Vietnam, but the practice is not unheard of. ■

## Turtle's shell formed from ribs inside the egg



ENCYCLOPEDIA BRITANICA

Japanese scientists from the Riken Center for Developmental Biology in Kobe, Japan, have discovered how the turtle's shell develops. The scientists studied and compared the development of soft-shelled Chinese turtles, chickens and mice. They observed a folding process that occurred only in the turtle, producing a disk-shaped

thickening of the skin on the back that indicated the position of the shell. The ribs grew outward from the developing shell trapping the turtle's shoulder blades inside its rib cage. This developmental difference is unique among vertebrates whose shoulder blades are formed outside the rib cage. This finding challenges the traditional theory

that the shell forms from small bony plates within the turtle's skin. The researchers also found that one stage in the embryonic development of the modern turtle resembles that of a 220-million-year-old fossil discovered in China last year. The 2008 finding in China is the oldest turtle fossil on record. ■

# turtle tales



## Kemp's ridley sea turtles nest count increases

For the fourth consecutive year, the number of Kemp's ridley sea turtle nests increased along the coast of the state of Texas in the United States.

"There were 197 nests on the Texas coast—two more than last year. There was less on the upper Texas coast due to the hurricane (Ike in 2008) damaging the beaches, but the turtles went to other beaches," said Carole Allen, Gulf office director of the Sea Turtle

Restoration Project.

The lower nesting figures on the upper Gulf Coast of Texas are due to storm erosion of the beaches changing the grade of the slope and the renourishment of many beaches along the Bolivar Peninsula. Studies show that renourishment hinders turtle nesting, but that it rebounds the following year.



USFWS

Allen said, "We are awaiting release of the new government Recovery Plan for the Kemp's ridleys and hope that the Texas coast is declared critical habitat for this endangered sea turtle." ■

## Acclimating captive Hawksbills

On the island of Nevis, in the Caribbean, Barbara Carr Whitman with the Under the Sea Sealife Education Center has been acclimating sea turtles prior to release into the sea since 2002.

According to experts, methods of acclimation vary and have not been studied thoroughly, but it is believed that sea turtles raised in captivity do not have the innate

skills necessary to thrive in the wild. To prepare the turtles for release, they are kept in a 2000 gallon aquarium allowing the turtles to swim while in captivity. The tank is populated with fish and invertebrates and made to resemble the wild as much as possible. When the turtles are between 16 and 18 months old, wearing a special harness, they are taken for swims in

the sea to slowly acclimate to the wild.

Whitman believes that acclimation will reduce stress at the final release and boost the turtle's chance of survival. During the acclimation period the turtles increase their muscle strength and adapt to a world without walls, predators or a ready supply of food. ■

## Tracking endangered sea turtles with barcoding

The American Museum of Natural History and the University of Canberra, among other organizations, demonstrated that barcoding can be applied to all seven sea turtles and provide insight into the genetic structure of this widely dispersed group of animals.

Barcoding items collected by wildlife management can provide

information and tools to track international trade in wildlife. The barcode sequences from the study have been supplied to the Barcode of Life database and GenBank, so that the data are freely available. The potential for DNA barcoding is significant: trade in meat, eggs,



leather, shell and bone means that the species identity or geographic origin will be

easy to decipher assisting wildlife management in halting the trade in endangered species. ■

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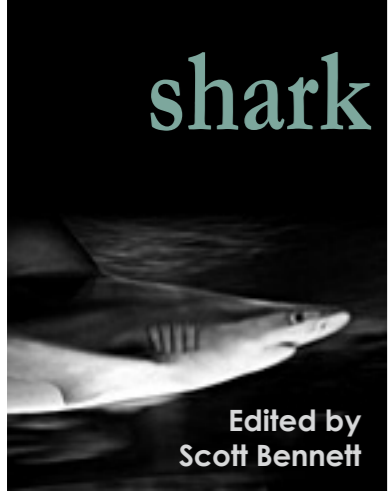


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Edited by  
Scott Bennett

## World's First Shark Sanctuary in Palau

During the recent United Nations meetings, the President of Palau, made a bold initiative: the creation of the world's first shark sanctuary within the territorial waters of his tiny Pacific nation. President Johnson Toribiong said his country wanted to provide "a sanctuary for sharks to live and reproduce unmolested in our 237,000 square miles of ocean". That is an area

bigger in size than France. He urged other countries to follow suit and ban shark fishing in their waters.

"It is anomalous that Palau is experiencing economic difficulty while it sits in the middle of the richest waters in the world. We can no longer stand by while foreign vessels illicitly come to our waters to take our greatest resource, our tuna stocks, without regard to their

conservation and without regard for adequate compensation to the island States which rely on this resource," President Toribiong concluded.

The diving industry has long championed protection of the world's shark populations. Palau is a South Pacific scuba diving hot-spot, and divers internationally applauded the President's announcement. ■ SOURCE: AP



EDWIN MARCOW



WIKIPEDIA

Bull shark

## 'Swim with sharks' tours may become illegal on O`ahu

The Honolulu City Council gave preliminary approval today to a bill that would ban so-called "shark tours" from operating on O`ahu.

There are currently two shark tour companies on the island, Hawaii Shark Encounters and North Shore Shark Adventures. Both companies are based in Haleiwa and attract sharks by throwing bait into the water, then lowering customers into the ocean in cages covered in Plexiglas to see the sharks up-close.

State law already makes it illegal to operate shark tour boats within three miles of the shore, so tour operators are forced to go out into international waters. The bill before the City Council would make it illegal for to run "shark tour operations" defined as "the maintenance of an office, the collection of a fee or other financial consideration, the distribution, marketing, or advertising of tickets, or the conduct of any other business

activity" related to shark tour boats on O`ahu.

Councilman Charles Djou, the bill's sponsor, asserts in the proposed ordinance that the existence of shark tours "raises public safety concerns for ocean users, is disrespectful of Hawaiian culture, alters the natural behavior and distribution of sharks, and may be disruptive of ocean ecology and the natural environment".

Djou's bill comes on the heels of a Maui County ordinance passed September 8, which makes shark tours illegal in Maui County (the islands of Maui, Moloka`i, and Lana`i). Maui's bill used identical language to the O`ahu bill in defining shark tour operations.

Despite the recent bans, a recent University of Hawai`i study found that shark tours "have a negligible effect on public safety" and do not draw sharks closer to shore. ■

SOURCE: EXAMINER.COM

## Shark Diving—Do or Don't?

The proverbial shark diving debate is a can of worms that seems determined to remain open. Staunch supporters on either side seem utterly determined to dismiss the other's claims, yet like any issue, there are definitely pros and cons to each. Naysayers claim the practice promotes untaural behavior and poses a threat to the participants, while defendents claim it helps an increased awareness of the species' plight and aids in conservation. Rather than a purely black and white issue, it is an entirely grey area, with valid points to each. Feeding wild animals or altering their behaviour is far from a good thing, but I tend to believe increased awareness is starting to outweigh the cons. If the sharks are being protected and stringent safety is practiced, it is the lesser of two evils by far. Who is right? You be the judge.

—Scott Bennett

# Clement Lee

Text and photos by Peter Symes

**Clement Lee is the embodiment of the entrepreneurial dive industry pioneer. A quarter of a century ago, he seeded what was later to become a flourishing recreational dive industry in the Malaysian state of Sabah. In this interview, we take a reminiscent look back at the challenges overcome and the awards won.**

*PS: When was the first time you saw and dived on Sipadan? Can you recall your first impressions and sentiments? Did you think that this could become one of the finest dive destinations on the planet?*

CL: We started Borneo Divers in 1983, but it was in 1984 we went to do a survey of a freighter in Ligitan reef, and after the survey, we went straight to Sipadan to check it out, because we could tell from the depth charts that it had to be significantly different from the other islands that we knew.

And already from the first

time we hit the water there, we saw that it was something special and that this was our future. What I saw was beyond description. It was like a living aquarium. We thought it was an adventure area, but at the same time, we also asked ourselves how to protect this pristine environment and the marine life.

*PS: What was there then? Was there any sort of tourist infrastructure in the area at all?*

CL: Semporna (the bustling town which is a point of disembarkation for the resorts on Mabul, Kapalai and others –ed.) was just a fishing village at the time, with no infrastructure and only very basic facilities. When we started off on Sipadan, we had to buy, hire and bring in everything from Semporna and Tawau (bigger towns some distance away –ed.) using chartered boats to bring it to the island. In a way, there was none at all. We had to start from zero.

*PS: What made you decide to go into recreational diving and build a dive operation?*

CL: There was no professional recreational dive industry at all

at the time. So, we needed to start it, but at the same time, we also needed to start dive tourism in the area. We brought in the first guests in 1984 and never looked back.

*PS: What obstacles did you have to overcome?*

CL: Oh dear... There were just too many. Since we are talking about Sipadan, it was everything from permissions to logistical issues and setting up infrastructure. Because we were the pioneers, nobody knew about recreational scuba diving or what the dive industry was all about, so there was no help to get. We had to organise everything ourselves. And at that time, things like the airport were not as good as they are today, and transfers from the airport took 3-4 hours in contrast to the hour it takes today. It was a quite a challenge, but I am glad to say that over the years, things have smoothed out and better infrastructure has been built.

*PS: What do you consider your biggest victories or achievements?*

CL: When we started, we knew where we going. The ques-

Clement Lee in his Kota Kinabalu office





tion was how we were going to achieve it? So, seeing Sipadan now being hailed as one of the best dive sites in the world and bringing it to the public, I consider that our biggest achievement in terms of the hard work that was put into it. Another is being able to sit down and work out how to protect the island

*PS: Sipadan seems to be better protected now, but do you think the latest protection measures and restrictions are the right ones? What can be improved?*

CL: Sipadan now has a limited quota of 120 guests per day, which in many ways, is a role model, although the system can

be improved, because the crucial number is not the number for visitors, but the number of dives. But we do feel that Sipadan is now protected for the future, and that we have already seen results in the form of improvements in the marine life.

*PS: The limited number of day*

*guest permits (120) for Sipadan obviously fall far short of popular demand. With all the resorts now in the area, how is it possible to distribute these permits fairly? Who has the final say?*

CL: This is quite a difficult question. There will never be enough, which means that some or even

a lot of guests will be disappointed if they don't get to Sipadan, but as I often tell my staff or fellow resort operators, "In order to see the rainbow we have to put up with the rain." It is a necessary sacrifice we had to make. So, in my explanations to my divers and colleagues, I always urge them to protect the underwater environment, and I ask them to think if they do one dive less, they are actually contributing to the protection of the environment.

In regards to the number of permitted visitors, it is still controlled by our National Security Council, which is an independent body that has the final say on the matter.

*PS: The number of resorts*



THIS PAGE: Images from Borneo Divers resort on Mabul Island  
TOP LEFT: Clement Lee enjoying breakfast with guests in the canteen



is no point in just transferring the problems of Sipadan to another island. That being said, there are quite a lot of islands in the area that are uninhabited, undeveloped and where the underwater life is of equal quality—in terms of macro life—to Mabul. The only problem is that this area once had some issues with dynamite fishing, but tourism will put a definite end to it, and thus improve the environment. So indirectly, tourism will improve the marine life. Meanwhile, curbing over-development in some areas will come down to the authorities.

*PS: A while back, there were rumours about shark finning taking place on Mabul? Was there any truth to it?*

CL: We need to get the perspective right. There wasn't shark finning as such where you cut off the fins and throw the rest of the fish back to the sea, and I can assure that that isn't the case. There are only three families on the island that have been involved with shark fishing, and they have been doing so for centuries, but they go far away from the island and into international waters to do their catches, and they sell the whole fish, and

they don't go out very often anyway. I've been living on Mabul since 2004, and now I actually see more sharks today than few years ago. Probably not because there are more sharks, but that they are less shy of people than before. I've checked with the fisheries departments, and while there are no formal catch limits in place here, there don't seem to be any concerns about the local shark populations either.

*PS: There were also some writings in the press about an aquarium to be built on Mabul? What was that about?*

CL: I know very little about this project. But it was actually about an 'Oceanarium' that was more like a museum. But if someone has the significant kind of money needed—which I doubt—the money is better spent elsewhere, such as Ligitan Island, which I said to the consultant on the project. But I have not heard anything about any developments.

THIS PAGE: Scenes from Borneo Divers resort. RIGHT: On the pier, Clement Lee prepares an underwater camera



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*PS: You are also the chairman of Sabah Tourism Association. How do you see Sabah's development economically in an ecologically sustainable way? Coming to the region as a tourist, one gets the impression that a lot of rainforests have been and still are being cleared to give way for oil palm plantations. Are the conservation laws and measures strong enough to stand up against big economic interests?*

CL: In Sabah, we are helping to develop a nation, and we have to do what we need to develop the country, but as a member of the Sabah tourism board, I know that whatever we do, it's going in the right direction, because we are continuously working in an ecologically sustainable manner and promoting our region in terms of adventure and ecotourism. We adopt the principle of less is more, in not going after the mass tourism, which we can't accommodate. We don't want to have to build a big theme park when we've got great nature.

In regards to the felling of the trees, it is to make room for oil palm plantations, which is the main source of our income. But I must also highlight that in those areas where forests are being cleared to make room for plantations, special reforestation programs are implemented under which new trees have to be replanted, so that the same acreage of forest is maintained and managed in a sustainable way. Also the conservation laws now regulating the oil palm indus-

try require the establishment of wildlife corridors and compulsory wildlife zones. I do believe that while we have made mistakes in this area in the past, we are now going in the right direction.

*PS: What is the key to successfully balancing being an entrepreneur and having a family?*

CL: (Laughter) This is a tricky one and a balancing act. I suppose that wife and husband must share the same ideology, principles and commitment at the same time but—believe me—it also calls for a lot of sacrifice. But if you share a vision, you also know where the sacrifices will take you.

*PS: What diving experience has had the biggest impact on you?*

CL: Diving has had a tremendous effect on me and has changed my entire life. It has made me more conscious about my surroundings and the environment. Before I took up diving, I did not know what was important and what effected me. I didn't care. Now, I am much more aware of the surrounding life. It has opened my eyes and made me much more alert. It changed my mind. I started noticing things, seeing the colours, and I started wondering about things I saw in nature. I now know where I am going and feel like I have to share my experiences with world. I can't imagine what I would be without diving. I never looked back after taking up diving.

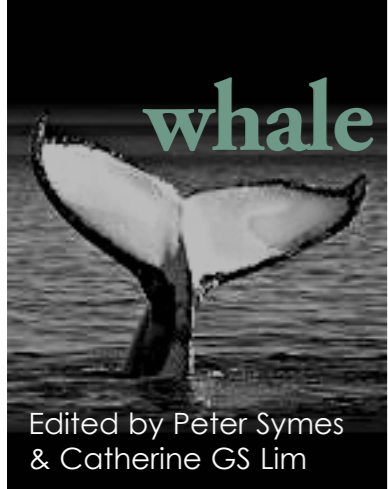
*PS: What is your next ambition or dream?*

CL: Well...umm, to retire as a Malaysian diving ambassador. No, I am just kidding. I would like to see the local dive industry, which we have been nurturing since our beginnings in 1984, to continue to develop and serve as a role model for the many upcoming countries that are just about to develop their own dive industries, and (I hope) that Sipadan can be a good example of how a government can balance money and the environment and be prepared to make long-term and investments in the future and in a sustainable way. That is something I think we can be proud of.

*PS: Any other thoughts you want to share with us?*

CL: People who see me dive at the resort—and I regularly dive four dives a day just like many of them—often ask me if I ever tire of diving. No! I still get a lot of fun out of diving. And I still get a lot of joy out of seeing happy customers enjoying the underwater environment. This is very important to me, to continue to have this kind of fun. At the same time, I also let my staff dive, now that we do make money, but we make it from happy customers and not somebody unhappy, and we continue to do so. I have to show them how beautiful the underwater world is. ■

Clement Lee in front of the numerous international resort and dive industry awards he and his operations have garnered over the years. TOP LEFT: Sipadan Island



# whale tales

Edited by Peter Symes & Catherine GS Lim

*Indohyus, a 48-million year-old semi-aquatic herbivore, and hippos fall closest to cetaceans when the evolutionary relationships of the larger group are reconstructed.*

ARTHUR WEASLEY VIA WIKIPEDIA. REPRODUCED UNDER THE CREATIVE COMMONS ATTRIBUTION 3.0 UNPORTED LICENSE

*Ambulocetus natans*, a primitive whale from the Eocene of Pakistan, pencil drawing, digital coloring



# On the Origin of Cetaceans

**Cetacean ancestors probably moved into the water before changing their diet, and subsequently, their teeth began to include carnivory, a new study finds.**

The origin of whales, dolphins, and porpoises—with their highly modified legs and lack of hair—has long been a quandary for biologists. Already some 60 years

ago, researchers first suggested that cetaceans were related to plant-eating ungulates, specifically to even-toed mammals like sheep, antelope and pigs. In other words, carnivorous killer whales and fish-eating dolphins were argued to fit closely with the herbivorous hoofed animal group. More recent genetic research found that among artiodactyls, hippos are the cetaceans' closest living relatives.

Because no one would ever link hippos

and whales based on their appearance, fossil evidence became an important way to determine the precise evolutionary steps that cetacean ancestors took.

Traditionally, the origin of whales was linked to the *mesonychids*, an extinct group of carnivores that had singly-hoofed toes. The recent discovery of *Indohyus*, a clearly water-adapted herbivore, complicates this picture (as new fossils often do) because of ear bones similar to those of modern cetaceans,

which are theorized to help the animal hear better while under the water.

"*Indohyus* is interesting because this fossil combines an herbivore's dentition with adaptations such as ear bones that are adapted for hearing under water and are traditionally associated with whales only," said Michelle Spaulding, lead author of the study and a graduate student affiliated with the American Museum of Natural History.

The team found that the least complex

evolutionary tree places *Indohyus* and similar fossils close to whales, while mesonychids are more distantly related.

## Cousin hippopotamus

Hippos remain the closest living relatives. These results suggest that cetacean ancestors transitioned to water before becoming carnivorous, but that the meat-eating diet developed while these ancestors could still walk on land. ■

SOURCE: PLOS ONE



## Rare Risso's Dolphin Sighted Three Years Later

The sighting of a rarely seen Risso's dolphin in Wales and later in Cornwall three years later is helping scientists gleam more information about the animal's offshore habits.

Although Risso's dolphins are found worldwide in both temperate and tropical waters, they generally prefer to swim in deep offshore waters, so they are rarely spotted by people. Hence, compared to other dolphin species, we have very little knowledge about the structure and size of the Risso dolphin population in the United Kingdom.

The particular dolphin that

had been spotted was first seen off Bardsey Island in Wales. Then, in June this year, three years later, the same dolphin was photographed off Mounts Bay in Cornwall, 172 nautical miles away.

"This is a fortuitous, unique and very interesting discovery," said Mark Simmonds, international director of science at the Whale and Dolphin Conservation Society (WDCS).

"Because of their typically inaccessible habits, relatively little is known about the biology or behaviour of this species and it is very interesting to know that

those seen off Cornwall may be the same group as those seen in Wales."

At the moment, little is known about the Risso dolphin's biology or character. The WDCS had proposed that more research be done and that protection be given to areas where Risso's dolphins are commonly found. An ideal choice would be the area around Bardsey Island is now known to be a breeding and nursery area for the species. This area is also home to other cetacean species like bottlenose dolphins and harbour porpoises. ■

Risso's Dolphin — this one was encountered outside Port San Luis, Harford Pier, California, USA

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# A plague of Plastic Soup

Text by Bonnie McKennah  
Images courtesy of NOAA and NSF

**When you use a plastic bag or purchase a beverage that is in a plastic bottle do you consider where it goes when you are finished with it? Do you think it goes to a landfill to be buried or to a recycling center to be destroyed or recycled?**

Think again, not all plastic makes it to landfills or recycling centers; much of it ends up in giant ocean vortexes called gyres.

Within these gyres is a plastic soup of waste. The Northern Pacific gyre alone is estimated to contain more than 100 million tons of flotsam. Some estimate that it is the size of Texas and others say it is as large as the United States.

Nearly 90 percent of the floating material is plastic and four-fifths of the rubbish comes from land. It is swept in by wind or washed in by rain off streets, highways and unconstrained landfills into streams, rivers and eventually out into the sea.

The other 10 percent comes from ships; much of it from illegally jettisoned fishing gear such as nets, floats and synthetic ropes to avoid the expense of proper disposal after entering port.

In addition, every year thousands of cargo containers fall overboard in stormy seas spilling their contents. This debris, according to Dr Curtis Ebbesmeyer, an American oceanographer who has been studying ocean currents for more than 40

years, can spin for decades in one of a dozen or more gigantic gyres around the globe.

The United Nations Environmental Program, in 2006, estimated that 46,000 pieces of plastic litter are floating on every square mile (3.429 sq. km.) of ocean. According to Greenpeace, 70 percent of the plastic will sink damaging life on the ocean floor, and the other 30 percent will end up in a gyre and/or wash up on a distant shore.

The idea that this vast expanse of debris is akin to an island of plastic garbage that you can walk on, is incorrect; there is no mass, it is a soup of plastic. The plastic is distributed throughout the water column as well as the sediment on the sea floor. For this reason, there are no satellite photos of the debris.

## Long halflife

Eventually, plastic will break down into carbon dioxide and water from exposure to the sun's ultraviolet rays. On land, this breakdown can take decades, even centuries. At sea, it takes even longer because seawater keeps the plastics cool while algae, barnacles and other marine growth limit ultraviolet exposure.

According to Anthony

L. Andrade, a polymer chemist with the U.S.-based Research Triangle Institute, every piece of plastic manufactured in the past 50 years that made it to the ocean is still out there.

In 1997, Charles Moore founder of the Algalita Marine Research Foundation had his first encounter with what is often referred to as the "Pacific Garbage Patch," more than nine years ago. Moore was returning to Southern California from Hawaii after the Trans-Pac sailboat race when he decided to take a more northerly course just to try a new route. He first began noticing a line of plastic bags just below the surface of the sea, that was followed by an ugly tangle of junk: nets,

ropes, bottles, motor-oil jugs, tires, and toys.

Moore could not believe what he was seeing. Out in this desolate area of the ocean was a stew of plastic rubbish. He began to realize that the trail of plastic went on for hundreds of miles.

As his boat, *Alguita*, glided for a week through the bobbing toxic debris trapped in the area that is properly referred to as the Northern Pacific

Subtropical Gyre, Moore began to wonder how all the plastic wound up in the ocean, where it came from and what did it mean? His questions were soon answered and the discovery had a profound effect on his life.

## Setting up research

Moore has since dedicated his life to study what is going on out there and spread the word of his findings. Wanting to make a proper study of the rubbish in the gyre, Moore enlisted Dr Steven B.

Weisberg, an expert on marine environmental monitoring to develop methods for analyzing the gyres contents.

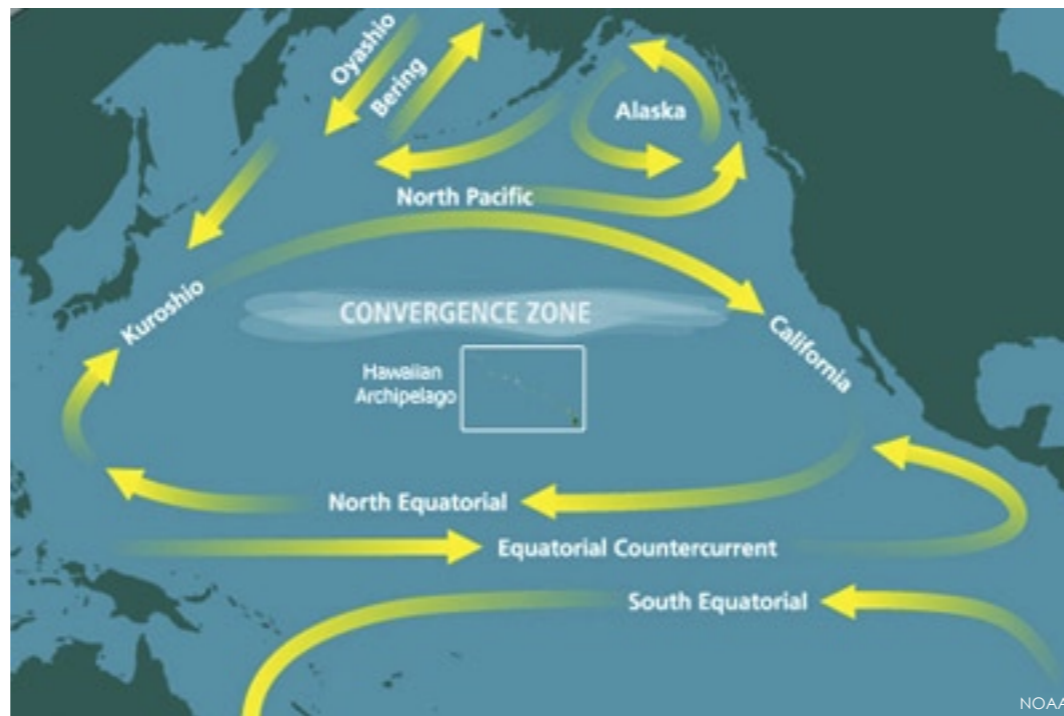
To get an accurate statistical model, Weisberg's group came up with a plan to make a series of trawls with a surface plankton net, along paths within a circle with a 564-mile (907.67-km) radius. The area of the circle would be exactly one-million square miles (3,429,904 sq. km.). Trawling would begin in the central pressure cell of the high-pressure system that creates the gyre. A manta trawl, an apparatus resembling a manta ray with wings, a broad mouth and trailing a net with fine mesh would be used to skim the surface of the ocean.

A year later, Moore and his crew set out aboard *Alguita* to test his theories, and to sample and analyze the debris in the gyre. Eight days out of port, in a becalmed sea, miles from their destination, they decided to practice their manta trawl technique. After trawling only three and a half miles, they pulled in the manta. What they saw amazed them. Within the rich broth of minute sea creatures was hundreds of colored plastic fragments; a plastic-plankton soup.

There was plenty of large debris in the path of *Alguita* too, by the end of the trip they collected about a ton of debris. The items included:



GUNIL SYMES



Map highlighting the North Pacific Subtropical Convergence Zone (STCZ) within the North Pacific Gyre. It is also the location of the Great Pacific Garbage Patch

THIS PAGE: Detail images of the garbage patch and the life that manages to cling to it



colored plastic fragments in their bellies.

In June of this year, Moore set out for yet another trip to the Garbage Patch to study the ever growing volume of plastic collecting in the gyre. Follow the *Alguita* by going to, <http://ovralguita.blogspot.com>

### Scope of the problem

The potential scope of the problem is greater than entanglement and ingestion. It has been discovered, by Japanese researchers, that the floating plastic fragments are sponges for DDT and PCB's and other oily pollutants. These plastic fragments are then ingested by jellies and salps living in the ocean and in turn are eaten by fish and so



- a drum of hazardous chemicals
- an inflated volleyball
- a plastic coat hangar with swivel hook
- a cathode-ray tube for a 19 inch television
- an inflated tire mounted on a steel rim
- numerous glass and plastic fishing floats
- plastic bottles
- tangles of nets, lines, hawsers mostly made from polypropylene

In 2001, Moore published his 1998 findings in the *Marine Pollution Bulletin*. From the collection and analysis of debris, it was estimated that there was six-pounds (13.2 kg) of plastic floating in the North Pacific Subtropical Gyre for every pound of naturally occurring zooplankton.

In 2008, the same 1998 study was replicated and Moore found the ratio of plastic to zooplankton had doubled in nine years. In subsequent trips, photographers have captured underwater images of jellyfish hopelessly entangled in frayed lines and transparent filter feeding organisms with

the poisons pass into the food web, which leads, in some cases, to humans.

A recently published article in the *Christian Science Monitor* shows that plastic has been collecting in the Atlantic gyre as well, this according to an ongoing study by Dr Kara Lavender Law at the Sea Education Association in Woods Hole, Massachusetts, USA. Law said that analysis of the plastics picked up by SEA's research shows much of it comes from consumer items made of polyethylene and polypropylene, which include items used in our common everyday life. Out at sea, these plastics suffocate sea turtles and choke sea birds which mistake the floating debris for food.

During the first week of the search for the remains of the Air France plane, off the coast of Brazil, investigators thought that

## Plastic Soup



they had located pieces of the plane, but on closer examination it was found to be nothing more than rubbish. Ebbesmeyer, quoted in a CNN report said, "That area [the crash site] has got lots of debris that's just out there, coming from Europe heading over to the America's." The search for remains of the plane highlights what environmentalist claim is one of the most pressing issues for the world today, plastic pollution.

It is estimated that between 500 billion and 1 trillion plastic bags are used worldwide each year and the number of plastic bottles, used each year, number in the trillions. Plastic bags can take as long as 1000 years to biodegrade; plastic bottles even longer. One scientist reports that these figures are only estimates because no one will live long enough to find out.

Now, when you dispose of a plastic bag or plastic drink bottle consider its life-cycle; regardless of whether it goes to a landfill, to a recycling center or makes its way into the ocean it will never naturally biodegrade in our lifetime.

For additional information, Google: *ocean gyres garbage*. Look for forthcoming articles dealing with the plague of plastic in our oceans: *The effects of plastic ingestion by marine animals*, and *Algalita Marine Research Foundation*. ■

### GYRE

A gyre is any range of large-scale wind, swirling vortex and ocean currents. Gyres are caused by the Coriolis effect, planetary vorticity, and friction, which establish circulation patterns from the wind curl. As the water flows in the oceans, it carries heat from ocean to ocean and from the equator to the poles. Variations in the transfer of heat lead to variations in weather patterns.

The earth's major gyres:

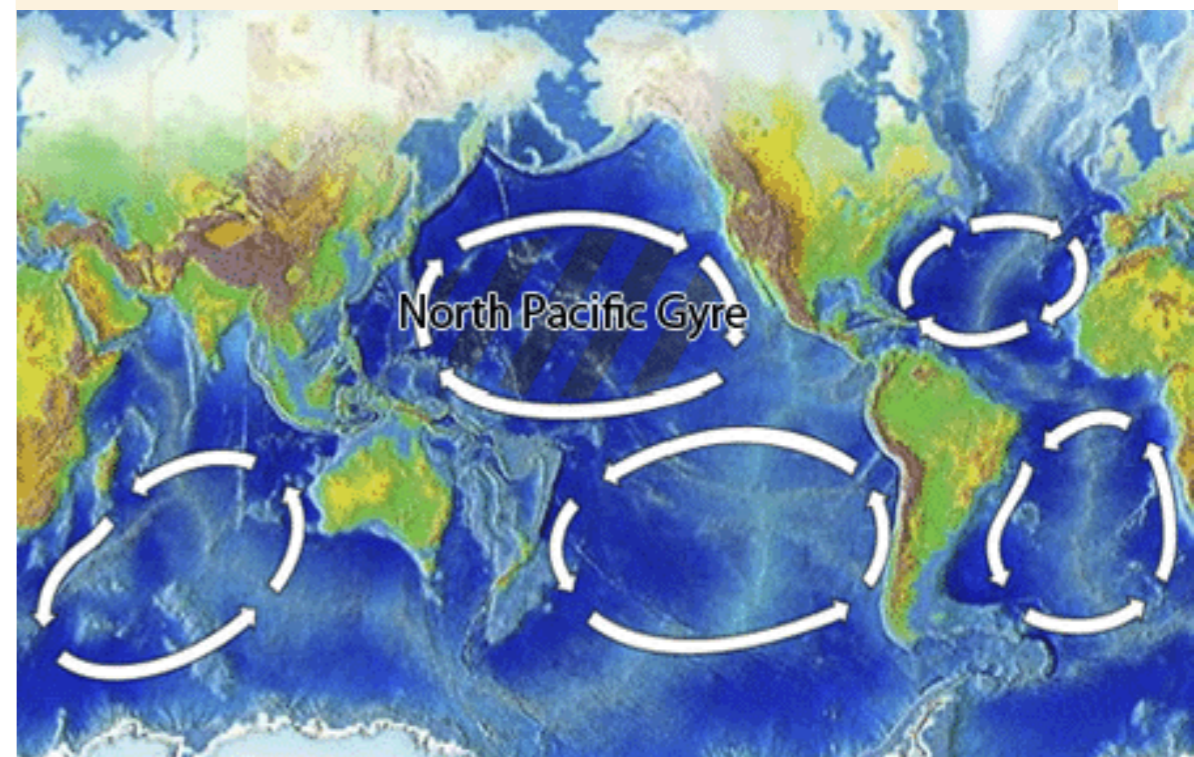
- North Atlantic Subtropical Gyre that includes the Gulf Stream, Labrador Current, East Greenland Current, North Atlantic current, and the North Atlantic Equatorial current
- North Pacific Subpolar Gyre
- North Pacific Subtropical Gyre, also know as the North Pacific Gyre—this gyre covers most of the northern Pacific Ocean, located between the equator and 50°N latitude and covers approximately 10 million square miles (34 million km<sup>2</sup>). The gyre has a clockwise circular pattern and is made up of

four prevailing ocean currents: the North Pacific Current to the north, the California Current to the east, the North Equatorial Current to the south and the Kuroshio Current to the west. An accumulation of man-made debris, known as the "Great Pacific Garbage Patch" is collecting in this gyre.

- Indian Ocean Subtropical Gyre
- South Atlantic Subtropical Gyre that contains the Brazil Current system
- South Pacific Subtropical Gyre that contains the East Australian Current system
- North Pacific Subpolar Gyre that contains the Alaska Gyre

The North Pacific Subtropical Gyre is made up of two large masses of ever-accumulating rubbish, known as the Western and Eastern Pacific Garbage Patches. It is in this gyre, a huge swirling mass of plastic soup, estimated by some to be the size of the United States that the plastic bag or plastic water bottle, thought to be in a landfill or recycled, may end up. ■

SOURCE: Wikipedia



Location of the North Pacific Gyre on global map



photo & video

Edited by  
Peter Symes  
& Scott Bennett

Close-up portrait  
of an adult Leafy  
Sea Dragon

LEAFY SEA DRAGON, *Phycodurus eques*, is an endangered, and thus, protected marine fish related to the seahorse and the pipefish. Slightly larger than most sea horses, they grow to about 30cm and are found around southern and western Australia on clumps of sand in waters up to 50 meters deep, feeding on plankton and small crustaceans. The long leaf-like protrusions sprouting out from all over its body gives it its name. However, these are not used for propulsion but serve as camouflage. An almost transparent pectoral fin and a dorsal fin help propel the creature, which mostly hangs very still in the water like floating seaweed. The male cares for up to 250 fertilized eggs (deposited on his back by the female) for nine weeks until they hatch.

— SOURCE: Wikipedia.com

# Macro

*The thought behind the image*

Over the coming months, I am going to take some of the more significant underwater images I have taken during my career, which in one way or another were either unique or rare images or taken under difficult and demanding conditions. From these images I will explain with the learning curve of my success's and failures, how I conditioned both myself and equipment to optimise the chances of success and how this then started to pay dividends. I have to say most of the the situations I will be talking about were taken on film some years ago. But my opinion is that we are talking about Photography where many of the rules regarding the medium that these photographs were taken on remain the same.

I hope that this series of articles will help some of you, the readers, with any questions you have regarding what I have to say. Please do not hesitate to contact me through X-RAY MAG with your inquiries.

The first situation I will be discussing is probably so far, the highlight of my career, being the most satisfying and rewarding. The birth of a Leafy Sea Dragon in South Australia.

It was in February 2002, I had been travelling to Kangaroo Island for some years, and initially my photographs were for articles in both *Dive* and *Nature* magazines. Which led to a number of group trips in the latter years. At this time, my learning curve was very steep. After a number of costly trips early in my career, I had come to believe in the three R's: "Be in the right place at the right time with the right people"—and then you wait for nature to either play the game or not.

Obviously, some events are seasonal, so if you are going after a specific event, make sure that you research both when and where this event will be at its peak. Most importantly, once you have this information, then you must find the right people with the experience to

take you to and show you this event whilst it is happening.

Over the years, I had always gone to Kangaroo Island with Jim Thistleton a dive operator with the reputation of being able to find the rare and elusive Leafy Sea Dragon. The first time I went with him he told me that he was going to take me three miles down this rugged Southern Ocean coast and put me on a juvenile Leafy Sea Dragon no more than two inches in length—this, he did.

So, it was on 8 February 2002. By now, I was carrying two housings with me on each dive, both Sea & Sea with Nikon F90x's—one set up for wide angle with a Nikon 17-35 zoom lense and twin YS120 flash guns. The other with a Nikon 105 lense with X4 Nikon close up lenses attached and an Inon ring flash. Some people questioned me as to why I burdened myself down with so much cumbersome equipment. But to me, it was about being ready for any eventual-ity; this day was to prove this theory absolutely correct.

Upon entering the water, I always drop to my working depth, settle myself and set up each camera so that they are ready for what I call a

Text and photos by Tony White





photo &  
video

reflex shot, should it arise. Apertures, shutter speed, flash angles, etc., etc., only then will I start looking for specific subjects. This day, I choose wide angle and started to photograph a mature male with eggs on his tail on a backdrop of stunning cold water corals.

I felt a touch on my shoulder; my dive guide was beckoning me over to where the rest of the group were watching something intently of which as yet I could not see. On arriving, my head went into a spin; there was a mature male again with eggs on his tail, the difference being that one of the eggs had started to hatch.

### Self control

The first thing I have to say is that no matter how urgent the need to start taking photographs here, self discipline has to take over. I knew instantly that within seconds the baby could detach itself from the egg casing and disappear, but it was no good blazing away on such a small delicate creature and losing the shot because it was too small or out of focus. So for a few short seconds, I settled myself with deep breathing and collected my thoughts on the important steps I must take.

This creature was so small that with my setup, I had to lock the focus so that image size was at its maximum. In other words, I took over manually, focusing by moving my head and housing back and forwards. Maximum aperture and appropriate shutter speed were already set as was the ring flash on auto. So, all I had to do now was provide absolute concentration on capturing the

A papa Leafy Sea Dragon carries eggs on his back. One egg is just about to hatch and a baby Leafy will be born. (Read the story of the birth on the next page)

image to the best ability of myself and equipment.

Time for me was passing in slow motion as I slowly clicked away, afterwards one of the group said, from start to finish, the event only lasted five minutes. The images will never win any prizes for their stunning composition exposure or dynamism. But with discipline and having the right equipment at hand, they do exist (It is worth mentioning that the rest of the group had opted for wide angle to photograph the mature males!).

During these five minutes, I obtained photographs of the birth, the baby free swimming, and finally with my wide angle, a perspective of a divers hand under the baby to give a true impression of the size. The images, over the years, have been published all over the world and are still to my knowledge the only still images taken of this event in the wild. The story being told from start to finish by the images themselves.

Without the three R's and the discipline of constantly doing the same things over and over, these images would not have been taken. I have also attached a small article below that was written at the time, which I hope conveys the importance of the moment. Please enjoy it and possibly reflect on your own system of underwater photography, its setup, and the discipline with which you use it.

*Tony White is a full time underwater photographer living in South Africa. He runs underwater photographic tours and workshops worldwide. For further information go to [www.seaofdreams.co.uk](http://www.seaofdreams.co.uk) ■*



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photo & video



Text and photos by Tony White

# Birth of a Sea Dragon

Kangaroo Island is Australia's third largest island. Some 150 miles long, it is made up primarily of farming communities, and over two-thirds of it has been designated national parks. Situated off the coast of Southern Australia, about twenty miles south of Adelaide, lies the home of the Leafy Sea Dragon, one of the world's most striking underwater creatures, and the official conservation symbol of South Australia. Endemic to the more temperate waters of the Southern Ocean, this delicate creature continually draws me back to these pristine waters on a regular basis to gaze in awe at one of nature's underwater wonders.

So, it was on the morning of the 8 February 2002, we sat in a small bay overshadowed by the rugged cliffs of this majestic island onboard *Wind Cheetah*, Jim Thistleton's dive catamaran of Kangaroo Island Diving Safaris. Jim is the acknowledged expert on these creatures and has been tracking the local population for the last ten years. When Jim says there is a leafy under the boat, that is exactly where it is.

On arriving the previous week, I had been overjoyed when Jim had informed me that because of the bad summer, some of the male leafies were still carrying eggs—an event which in normal summers should now have been over. With this in mind, I entered the water to photograph these stunning creatures.

I encountered an egg carrying male at approximately 12 metres and went about the usual routine of angles, flash settings, etc, when Micky, my dive guide came over to me and with her fingers indicated towards what I thought was a juvenile Leafy that she had just found. I followed her to a position further up the reef wall.

What I saw sent life into slow

motion, as I started to experience one of the rarest moments of my life. Lazily swimming along the reef wall was another male carrying eggs with the significant difference that one of the eggs had begun to hatch from the egg casing. The head of new born leafy, no more than 1/8th of an inch in length was emerging. Micky, acknowledging the importance of the moment, had assumed an almost prayer like position overlooking this spectacle. Over the next five minutes, which seemed like an eon, I managed to acquire unique images of this tiny creature's struggle for life. Finally, when he had emerged and detached from the egg, he was no more than half an inch in total length, with all his markings in place that he would carry through his future life.

I expected him to be at the mercy of the currents, but it was not so. I witnessed this tiny creature freely swimming and in control of where he was going. Although I had by now finished all the film in the camera, Micky and I stayed for as long as our air allowed witnessing for us a rare moment in time.

Reluctantly, we left him to his fate, despite the odds being stacked against him with a survival rate at about 1,000 to 1 against. To this day, I constantly wonder and hope that he has managed to survive, and somewhere in that vicinity, he is continuing to thrive and grow into the magnificent creature, which I admire so much.

The rarity of this experi-



ence has only now started to emerge. Jim Thistleton in his ten years of constantly diving with these creatures on a daily basis has only witnessed this event three times. These still images are thought to be the first of their kind photographed in the wild, and for two people in this world, they have unique images and experiences to carry for the rest of their lives. ■



THIS PAGE: Witnessing the birth of a tiny Leafy Sea dragon is magical and a very rare event to observe in the wild. COUNTERCLOCKWISE FROM BOTTOM RIGHT: Actual birth from an egg; New born swimming freely; New born fully emerged from egg on papa's back; New born freely swimming over diver's palm shows the relative tiny size of it

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## Ikelite housing for Sony's HDR-CX100

The molded clear polycarbonate construction provides full view of the camcorder, control functions, and is rated to depths of 60 meters. The large viewing screen can be seen easily through the housing back, although menu functions accessed through the camera's LCD touch screen are not accessible in this installation. The base removes instantly with a unique toggle clamp for traveling or attachment of the optional Pro Video Lite 3 battery pack. The housing accommodates Sony NP-FH50 and NP-FH100 batteries. [www.ikelite.com](http://www.ikelite.com)



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A-Data SH93 external drive comes with a wraparound USB cord that can remain up to one metre underwater for 30 minutes with no ill effects. Just the ticket for beverage-related disasters while uploading files! Available in capacities of 250GB, 320GB, 500GB and 640GB. Prices to be announced. [www.adata-group.com](http://www.adata-group.com)



## Amphibico XDAmphibicam

The newest member of Amphibico's Amphibicam family of underwater professional housings is the XDAmphibicam X3 for the Sony PMWEX3. The compact housing boasts full access of the Sony PMW-EX3 camcorder controls with all the important features such as White Balance, ND Filter, Gain, Shutter Speed, Iris, Zoom, and Manual Focus are all at your fingertips. Some might call it the little brother of the HD Amphibicam with matching features, except it is better suited for travel with its compact size. [www.amphibico.com](http://www.amphibico.com)



## SEALUX HD520 housing

for the Sony HDR-XR520VE and HDR-XR500VE

Now the Sony HDR-XR520 / HDR-XR500 camcorders offering outstanding picture quality, especially in lowlight mode, can fully prove their capabilities even under water. Perfect, brilliant video recordings in HDV DV quality both in the 16:9 and 4:3 formats, and high-definition photos of up to 12.2 megapixels are possible. The SEALUX HD520 UW housing is small, light and designed for optimal grip operation. The maintenance-free electronic 10-key control makes operation even easier. Now, for the first time, it is possible to operate all camcorder functions (such as WHT, aperture and shutter time, focus,

zoom and many others) using the electronic touch screen control.

The close-up lens which can be swivelled down under water and the colour correction filter (URPRO filter) extend the range of use of the HD520 housing. Optimal monitor viewing without a mirror and the effective ambient light shielding system make taking and viewing shots a real pleasure even during your dive.

Available as extras are a zoomable wide-angle converter lens and a fisheye converter lens with an extremely wide shooting angle of around 145 degrees. To name an additional highlight, you can use High Grade Wide-Angle lenses made by Fathom offering outstanding picture quality. Further extras such as the powerful SEALUX lighting system and an ultra-light transport case cater for all you could wish for.

# Jude Cowell



## P O R T F O L I O



# portfolio

PREVIOUS PAGE:  
*Breaksea cod,*  
*Epinephelides armatus,*  
*Geographe Bay* by  
Jude Cowell. Prisma  
pencil on paper

Text edited by Gunild Symes  
All images courtesy of  
Jude Cowell

**Welcome to the dreamy underwater world of American artist, Jude Cowell, who creates fantastic botanically drawn fish portraits to inspire the imagination. Her blending of “the real with the visionary” results in artwork that immediately takes one to the magical deep. Just eyeing one of these velvety beauties, one can almost feel the current brushing through one’s hair. X-RAY MAG’s Gunild Symes caught up with the artist to gain insight into her Dreamyfish Art portraits.**

GS: Welcome. Tell us about yourself and where you are from.

JC: Thank you, it's an honor to join you for X-RAY MAG!

I am an American artist and a native of Athens, Georgia, where I currently reside in a nearby rural county within the sound of a river's waterfall. A lifelong pencil and pen-and-ink artist, my current focus is on colored pencil portraits under the imprint Dreamyfish Art.



*Ornate butterflyfish, Pentapodus porosus, Exmouth Gulf* by Jude Cowell. Pencil on paper

GS: Describe your Dreamyfish Art portrait series for us and how it came about.

JC: Portraits are rendered as botanically accurate as possible and are then set within colorful fantasy scenes of their grandest imaginings. This allows the viewer a 'sneak peek' into a fish's most private dream, for after all, fish dream, too.

The concept first occurred to me in 2003 when I noticed that photographs

of beautifully hued tropical fish were often taken at such depths that their backgrounds were lackluster blacks or browns. So, why not combine the real with the visionary and brighten the little fellows' spirits? Thus, were created my first Dreamyfish Art portraits.

Since the mid-1990s, I have drawn primarily on black paper, which I think gives depth and a spiritual flavor to images. Thereby certain special effects are achieved, which cannot appear when drawing on white



*Western Blue Devil, Paraplesiops meleagris (Peters), Recherche Archipelago* by Jude Cowell. Pencil on paper







Magpie morwong, *Cheilodactylus nigripes* (Richardson), New South Wales by Jude Cowell. Prisma pencil on paper

paper.

When two of my drawings were accepted in a city exhibition during the 1996 Summer Olympics in Atlanta, I was proud to represent Georgia to the world, and one of my cosmically themed entries *Timeless Path* received a merit award.

Beginning in the 1990s my works have been exhibited several times in Athens, Augusta, and Atlanta, Georgia, but since 2005, my focus has narrowed toward online galleries and portfolios.

GS: What is your medium and method of choice and why did you choose to use these?

JC: Prismacolor oil and Rexel Derwent watercolour pencils (dry) are my preferred medium, and the blacker and smoother the paper, the better the effect.

Drawing's traditional cross-hatching and layering techniques are methods of choice, and colors are mixed on-paper as drawings proceed. No preliminary sketches are done because not all fish images translate well onto black paper and not all photos have enough detail for me to work from. It's being able to tell the difference that makes prelims unnecessary with the result that each of my fish portraits are one-of-a-kind.

X-RAY MAG: Who are your role models or mentors and how have they influenced your work and your artistic vision?

JC: My most influential role model and art mentor has to be an amazing photographer and Art Professor, Dr Robert Nix of the University of Georgia Art Department. Actually, his instructions in drawing, painting, jewelry design and sculpture, along with two years of work on our school yearbook staff, occurred pre-college. And thanks to my courses in journalism, I was privileged to work as cartoonist for our school newspaper.



Western footballer, *Neatypus obliquus* (Waite), Geographe Bay by Jude Cowell. Prisma pencil on paper



*Bengal sergeant, Abudefduf bengalensis (Bloch), Houtman Abrolhos by Jude Cowell*  
Prisma pencil on paper

## Jude Cowell

*Pale sweetlips, Plectorhynchus pictus (Thunberg), North West Cape by Jude Cowell.* Prisma pencil on paper



My college level training was taken at Atlanta College of Art on Peachtree Street (High Museum), where I studied Fashion Illustration, Layout, and Design with Bill Johnson. My acceptance there hinged on what was primarily a pen-and-ink fashion design portfolio.

Strongest art influences include Cezanne, Manet, Renoir, Degas, and the jungles of Rousseau. Pissarro's *The Red Roofs* still packs a visual wallop with me.

Yet, a most telling and unconsciously absorbed influence came during childhood in the form of the dancing fishes in the Disney film, *Fantasia*. Later on, when Pixar's *Finding Nemo* premiered, I was thrilled with its brilliant undersea colors and forms—in fact, you might say I felt

right at home.

So, if I have a coherent artistic vision, it would be my blending of the real with the visionary, which hopefully creates something unique: botanically drawn fish with personality and verve!

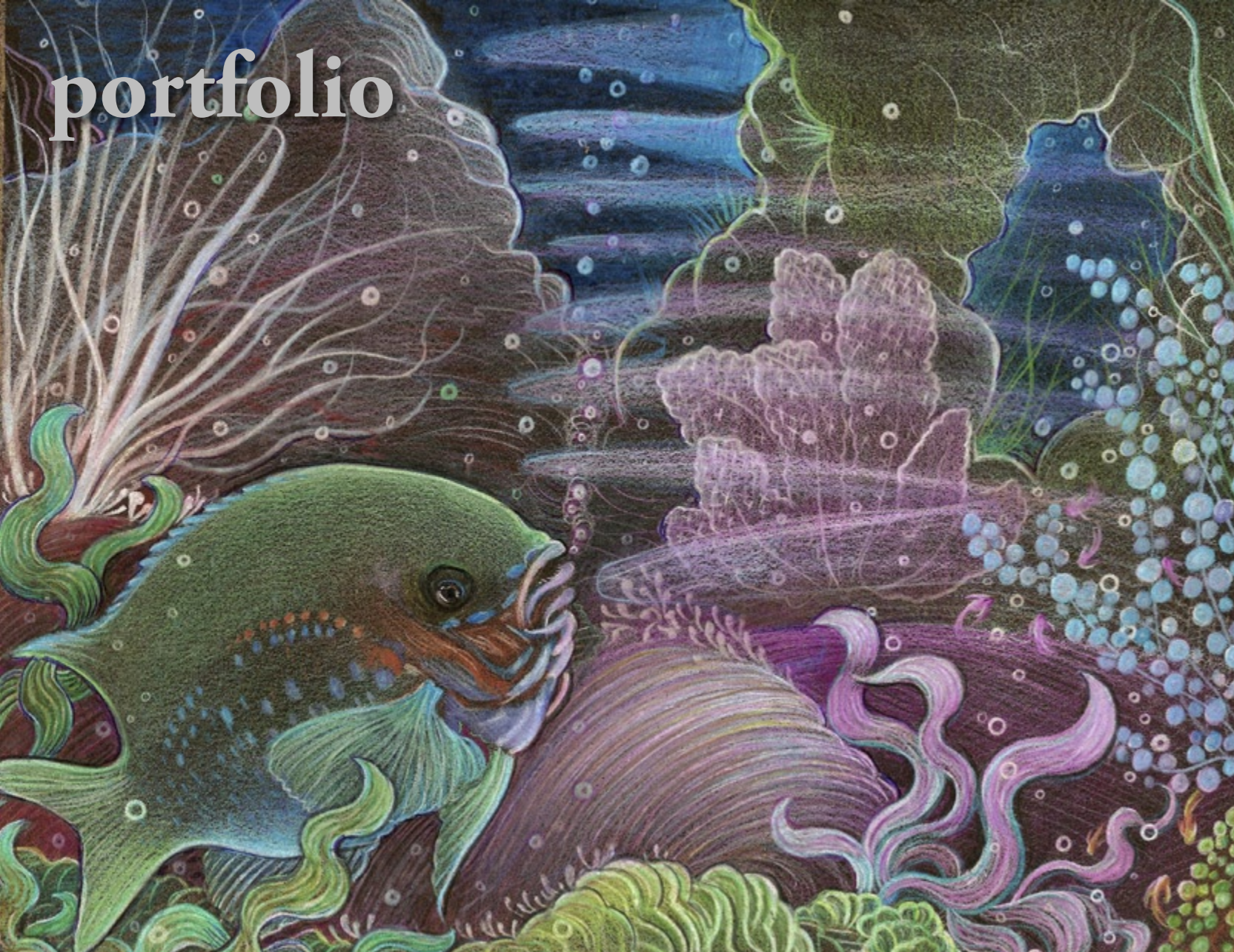
Other botanical and imaginary blendings are typical themes as well and are visible in my *Cosmic*, *Flower*, *Fairy*, and *Children's* illustrations and designs.

A natural visionary ability inspires my artwork, and sitting down at my drafting table with its magnifying lens, a large batch of freshly sharpened pencils, a blank sheet of paper, and a well-detailed photo of a tropical fish always results in fresh artwork.

*GS: Have you been to the underwater realm yourself? Are you a scuba diver? What are your favorite locations?*

JC: My practiced ability to shut out the world and cavort underwater with Breaksea cods and Western blue devils (in my mind) may be as close to scuba diving as I can now come, due to an unfortunate airplane experience a few years ago, which ruined my previous love of flying.

And so, this armchair traveller happily swims with the fishes of Western Australia (vicariously). Perhaps portraying them is part of the way I've dealt with the squelching of my wanderlust and an early love of coastal regions.



Victorian scalyfin, *Parma victoriae* (Guenther), Recherche Archipelago by Jude Cowell. Prisma pencil on paper

Brown-spotted wrasse, *Pseudolabrus parilus* (Richardson) Rottnest Island by Jude Cowell. Prisma pencil on paper

From childhood, I have visited beaches and islands of Georgia, Florida, South and North Carolina, with the most recent trip a family visit to beautiful Topsail Island off North Carolina in May 2009.

GS: What are your thoughts on ocean conservation and what role do you, as an artist, and your artwork play in local or global efforts?

JC: As I make notes for this interview on Saturday, September 19, 2009, the 24th annual International Coastal Cleanup is being held with volunteers across the globe collecting, cataloguing and indexing

marine debris to be transformed into clean, renewable energy.

And with *Save Our Oceans!*—a constant refrain in my online Dreamyfish Art Gallery—I have touted the global Cleanup project's amazing work upon this critical problem, and plan to continue doing my small part whenever possible to raise the visibility of this worthy endeavor.

Locally, my primary involvement is an annual mental health benefit where Art is much appreciated and sells well for the cause.

GS: So, does Art matter and can it help the world?

JC: Well, can the left brain survive without the right? Their balanced integration makes for a whole and healthier psyche, as my astrological studies have informed me.

And in our exhaustively tech-infused and information-overloaded times, everyone may benefit from a refreshing Art Break now and then, perhaps by way of a meander through an online gallery, perusal of an artist's blog, or by browsing a web-based storefront's offerings and placing an order to support the Arts.

And even if eye and brain refreshment were Art's only function, it would be worthwhile to

# portfolio



Bicolor scalyfin, *Parma bicolor* (Allen & Larson), Recherche Archipelago by Jude Cowell Prisma pencil on paper

JC: Current availability of my fish portraits includes a Lulu Storefront for Art Downloads at modest prices, which are suitable for use as screen-savers and for self-printing.

At this very moment, *Breaksea cod* and *Western blue devil* cordially await your visit there.

Now under construction is a Cafe Press shop, Jude Cowell Art, where frame-able 16 x 20 inch Dreamyfish wall posters will be offered in the US\$20 to \$40 range, with more images

pursue and enjoy. But on a collective level, the universal and archetypal symbols, which Art subliminally and overtly bestows, have the power to transform our minds and hearts more viscerally than mere words ever could.

For these reasons, I believe that humankind without Art is like a Dreamyfish denizen without a visionary dream!

GS: Where can people find your current works and what are your plans for future projects? Do you do commissions?

and products added as time permits. Plus, a Dreamyfish Art Calendar is in the planning stages for 2010, and a reputable giclée printer is being sought.

Private commissions are accepted subject to photo availability and artist approval of the suitability of the proposed photograph of the subject. Commission prices begin at US\$300 and artist's use of digital images is retained.

Thank you again for this wonderful opportunity to speak with you and share my lovingly created fish portraits with the readers of X-RAY MAG.

Yellow-eye surgeonfish, *Ctenochaetus strigosus*, Christmas Island by Jude Cowell. Prisma pencil on paper

— Save Our Oceans!

For more information or to purchase original and prints directly, please contact the artist at: [jude.cowell@hotmail.com](mailto:jude.cowell@hotmail.com) or visit Jude Cowell's webpages at:

Lulu Downloads  
[stores.lulu.com/judecowell](http://stores.lulu.com/judecowell)  
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## Jude Cowell

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