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DIVERS FOR THE ENVIRONMENT

WWW.EMIRATESDIVING.COM | MAGAZINE | SEPTEMBER 2015 | VOLUME 11 | ISSUE 3

CELEBRATING 20th ANNIVERSARY 1995-2015

SOCORRO & BAJA CALIFORNIA

MANTAS, SHARKS, SEA LIONS AND PELICANS

DIVE AGAINST DEBRIS • KIDS CORNER • **REEF CHECK** • A DIVING VOLUNTEER'S WORK
DUGONGS OF THE UAE • NIMAR UNDERWATER SYSTEM • **DIVERS ALERT NETWORK**

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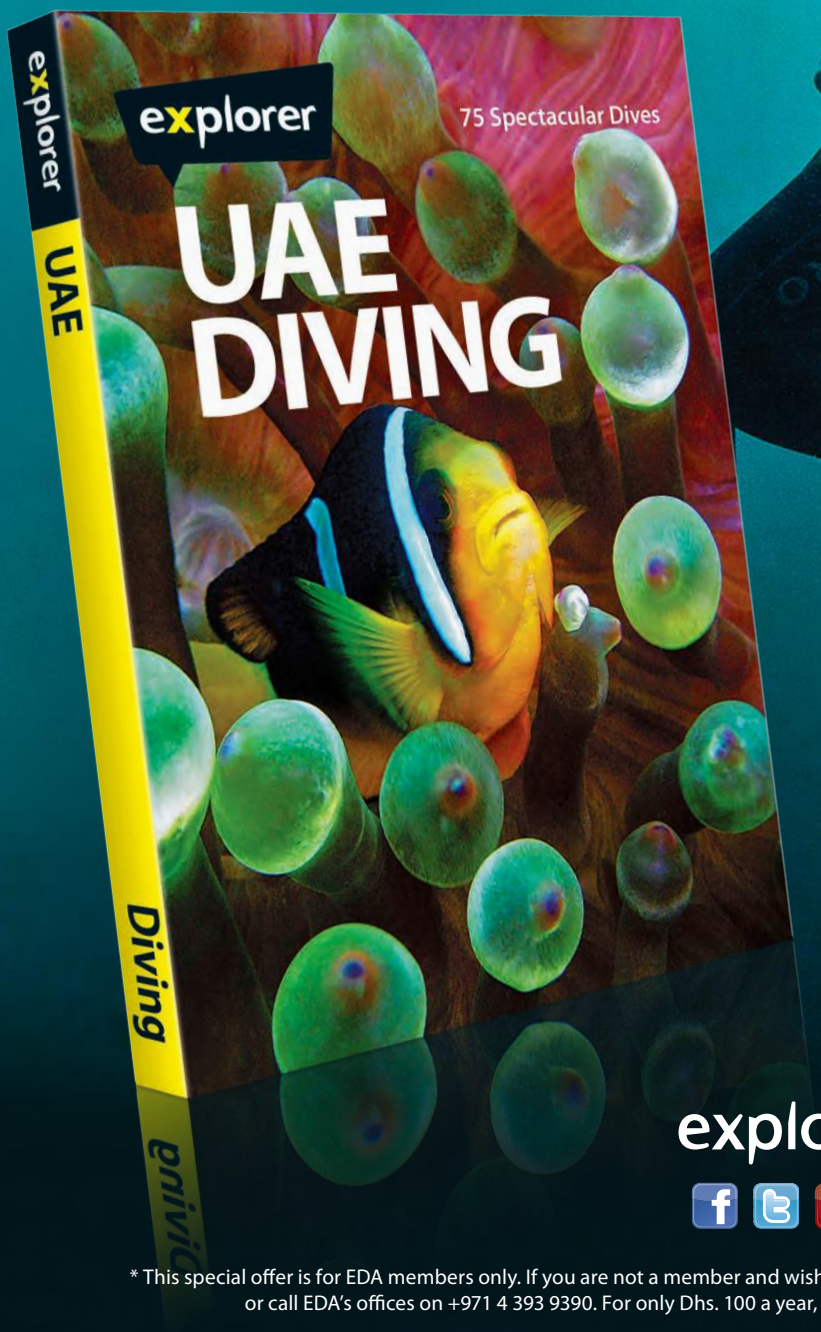

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EDA
جمعية الإمارات للغوص
Emirates Diving Association

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PHOTO BY SIMONE CAPRODOSSI

DIVERS FOR THE ENVIRONMENT

Please note that EDA's magazine, "Divers for the Environment" includes articles written by individuals whose opinions, whilst valid, may or may not represent that of EDA. It is hoped that the magazine can become a platform for individuals to voice their opinion on marine and diving related issues. You are welcome to suggest an article for the next issue of "Divers for the Environment" released in December 2015. Send all articles, feedback or comments to: **magazine@emiratesdiving.com**

REDUCE REUSE RECYCLE

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HEALTH

KIDS CORNER – FONT USED: **DYSLEXIE FONT**

Dyslexie font has developed a typeface especially for people with dyslexia called Dyslexie. People with dyslexia have problems distinguishing some letters. They sometimes turn, mirror and switch letters whilst reading. The Dyslexie typeface targets these problems by altering the shape of the letters so they are clearly different from any other letter. As well as this the spaces between the letters are improved and capitals and punctuation are bolder so people with dyslexia don't read words or sentences together anymore.

RESEARCH

Representative research among many dyslectics has now shown that the font actually helps them with reading texts faster and with fewer errors.

THE QUARTERLY CONTRIBUTORS

Meet the regular quarterly magazine contributors who share their passions, interests and the expertise of their fields for our readers of, 'Divers for the Environment'.

Want to contribute? Email: **magazine@emiratesdiving.com**

DR. ADA NATOLI
Ada is a specialist in population genetics applied to conservation of species. Having been involved in whale and dolphin research since 1992, she is a member of the IUCN Cetacean Specialist List and founder of the UAE Dolphin Project.
www.uaedolphinproject.org

SIMONE CAPRODOSSI
Simone is an Italian underwater and travel photographer with a passion for diving and the sea. Simone uses his photography to support environmental initiatives and is heavily involved in local shark and turtle conservation projects.
www.scaprodossiphoto.com

PATRICK VAN HOESERLANDE
Diving opens up a whole new world. Being a writer-diver and co-editor of the Flemish divers magazine Hippocampus, I personally explore our underwater world and share it through articles with others, divers and non-divers. You'll find a collection of my articles on **www.webdiver.be**

PAUL WARWICK
Born and educated in the UK leading to a career as an officer in the British Army. Now a specialist consultant for the UAE Government inbetween his other interests and his passions which are family, scuba diving (A PADI IDC Staff Instructor), conservation and marine management.

NICO DE CORATO
Blogger, marathon runner, triathlete, divemaster and heli rescue swimmer with Bergamo Scuba Angels. You can check my website **www.dubaiblognetwork.com**, contact me on social networks or via email at admin@dubaiblognetwork.com for information about my articles or just to say hello.

PHILIPPE LECOMTE
Having followed in his father's and brother's love for the sea, French diver and underwater photographer Philippe, took to underwater photography in 2006 after having moved to Abu Dhabi in 2003 and now seldom travels without his camera.
www.plongee-passion-photo.over-blog.com

DR. BARBARA KARIN VELA
Dr. Barbara Karin Vela is a Diving Medicine Physician EDTC/ECHM IIa, working in the Dubai London Specialty Hospital and a referral doctor in the United Arab Emirates for the Divers Alert Network Europe.
www.dubailondonclinic.com

CELEBRATING 20 YEARS OF CLEAN UP ARABIA

IBRAHIM N. AL-ZU'BI
EDA Executive Director

As the summer's humidity kicks in for the month of September and we retreat to the indoors, it is my great pleasure to present to you our September issue of 'Divers for the Environment'. As always, I am overjoyed with the support, not only on our diving campaigns and clean ups, but also from the quality and quantity of articles we regularly receive from our loyal readers, fellow divers and friends; including the divers from the world who send in their experiences or advice to other divers and keep us updated on international diving, their marine environment and other conservation events.

EDA's Clean Up Arabia 2015 will be on the 13th and 20th of November this year and I am sure you are all excited and gearing to join us all over the Gulf region to ensure we do the best we can to keep our beaches and ocean as clean as possible.

Clean Up Arabia will involve people from all walks of life in action to make a real difference. EDA members and sponsors, together with their families, will participate in the dive sites and beach clean ups which should help shape their consciousness concerning littering. The campaign's general aim is to clean the marine environment from pollution, as well as directing people towards having positive attitudes in maintaining a clean and sound environment by practice and participation.

We shall record the quantities and types of garbage collected by individual groups and will submit this to the International Coastal Cleanup (ICC) which compiles and analyses this information received each year by volunteers from all over the world. The final information is then used to educate the public, businesses, industries and government officials about the marine debris problem.

Clean Up Arabia is backed up by the Australian's 'Clean Up the World' campaign, the US-based 'International Coastal Cleanup' and PADI PROJECT A.W.A.R.E. All these organizers have years of experience around the world, coordinating groups from all walks of life, who will join together for the good of the earth.

This is the 20th year of Clean Up Arabia and it will be organized in the UAE and the region in collaboration with the United Nations Environment Programme. We are looking forward to seeing you all there and a big thank you in advance to all our clean up volunteers and of course, our sponsors.

Finally, follow us on twitter at EDA_UAE and send us your tweets! Let's get get Clean Up Arabia in motion and use #cleanuparabia in posts with info and photos about the event. You can also like us on Facebook and share your thoughts, stories, experiences and photography!

I hope you have all managed to have a diving holiday and explored somewhere new this summer. It's a wonderful world, so if you haven't managed to go off exploring just yet, then make sure you get a chance in September for the Eid break. Eid Adha Mubarak in advance, and as always, happy eco diving.

Dive Safe!

Ibrahim Al-Zu'bi

Ibrahim Al-Zu'bi

حملة النظافة العربية
CLEAN UP ARABIA
EDA 2015

REGISTER FOR CLEAN UP ARABIA 2015

13th NOVEMBER: Le Méridien Al Aqah, East Coast | **20th NOVEMBER:** Mina Zayed (TBC), Abu Dhabi (Divers Only)

YOU MAKE A DIFFERENCE

EMIRATES DIVING ASSOCIATION
EDA is a non-profit voluntary federal organization and is accredited by UNEP as an International Environmental Organization.
Tel: +971 4 393 9390 I **Email:** projects@emiratesdiving.com | **Website:** www.emiratesdiving.com

Join our group page on **www.facebook.com/emiratesdivingassociation** and share your thoughts and stories!
Follow us on **www.twitter.com/EDA_UAE** and send us your tweets! **#cleanuparabia**

AN EDA MOVIE NIGHT WITH VOX CINEMAS
THE SHARK CULL – A SEA SHEPHERD DOCUMENTARY

On the 15th of June, VOX Cinemas, Mall of the Emirates, Sea Shepherd Dubai and EDA hosted a screening of 'The Shark Cull', a Sea Shepherd documentary based on the Western Australian shark cull, exposing the brutal cruelty of the controversial program that took place off the Western Australia Coastline last summer. This explosive documentary on the WA's drum line policy is a must see for anyone interested in the protection of sharks and marine conservation.

Our guest speakers addressed the audience and answered questions in regards to the documentary and shared more about Sea Shepherd's current campaigns throughout the world which members could sign up to as onshore volunteers based here in Dubai.







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DIGITAL ONLINE EXHIBITION AT YAS MARINA

Yas Marina, Abu Dhabi hosted the Digital Online 2015 Exhibition in Building 2 over the months of June and July.


DIVE AGAINST DEBRIS AT AL AQAH BEACH IN FUJAIRAH

FEATURE AND PHOTOGRAPHY **DR IAN WING – PADI MASTER INSTRUCTOR**

On Friday, the 24th of July, a group of eleven divers successfully cleaned up the Reef Balls dive site off Al Aqah Beach in Fujairah. This article describes how we planned and conducted the dives.

BACKGROUND

Lying about 10 metres below the surface, the dive site consists of approximately 20 hollow concrete balls ranging in size from one to two metres. The balls were sunk in 2011 to create an artificial habitat for marine life on the sandy bottom.

A few weeks before the clean up day, a group of us dived the Reef Balls dive site. During this dive, we were very pleased to see eight green turtles living happily around the dive site. There were also some pufferfish, rays, lionfish, shrimp and schools of reef fish. We were however, very concerned to see the large amounts of underwater rubbish around the dive site.

We discussed the dive afterwards and agreed to share our photos on Facebook. The photos reminded us about the underwater rubbish – it was clear to us that something had to be done!

PLANNING

First, we made contact with Project AWARE in the United Kingdom and asked them for advice about how to successfully plan a Dive Against Debris. Then we spoke to Mr. Mohamed Helmy (PADI Course Director) from Al Boom Diving and asked for his support. He kindly offered us tanks, weights and equipment. Next we spoke to EDA and they kindly offered to provide us with mesh bags and gloves to enable us to safely collect the rubbish.

We agreed on the best date for the clean up dive and that interested divers should meet at the Al Boom Dive Centre at 9:00am. We then told our diving friends about this opportunity to do something for the environment and advertised it on Facebook and by email. We received a very strong response with over 20 divers asking for more information. Unfortunately several of these divers had to decline due to other family and travel commitments and the relatively short notice.

THE DIVE DAY

Eleven divers assembled at the Al Boom Dive Centre amid an atmosphere of excitement and enthusiasm. Four dives were planned. The first dive was to check the dive site and attach the surface buoy with a "diver down" flag above the dive site. The second dive would be the main clean up with almost everyone involved. The third dive would be for a small team to follow-up and check the dive site. And the fourth dive was necessary to remove the surface buoy from the dive site.

The divers received a very detailed briefing which covered: Project AWARE; diving against debris; what to collect; what to leave behind; diving safety; marine hazards; the dive site and the dive plan.

Before we began we warned all of the boat captains who were operating in the area that we would be diving from the beach. Each diver carried a mesh bag and wore gloves. Each dive team leader carried a surface marker buoy for safety, a compass for navigation and a cutting tool for freeing debris underwater.

When it was time for the main clean up dive, the dive teams prepared their equipment and did their buddy checks. They then entered the sea from the rocks at the southern end of the beach and followed the sand berms that run out towards the dive site. The team leaders led the divers and each diver worked in a buddy pair.

The dive site was marked by a line underwater and the surface marker buoy above. The divers were challenged by poor visibility in some areas and by the small rolling waves on the beach. But these problems didn't stop them from collecting the rubbish. The exit was made at the rocks on the northern end of the beach.

THE DIVERS

- Dr Ian Wing, Master Instructor (Coordinator)
- Barry Wrigley, Divemaster (Team Leader)
- Dean Prendergast, Divemaster (Team Leader)
- Jemuel Lao, Master Scuba Diver Trainer
- Zeek Zorkany, Assistant Instructor
- Alexandra Tobi, Rescue Diver
- Chris Haubold, Advanced Open Water Diver
- Kirsty Hill, Open Water Diver
- Sean Rigby, Open Water Diver
- Varun Jashnani, Open Water Diver
- Aldo De Jager, Open Water Diver

THE RESULTS

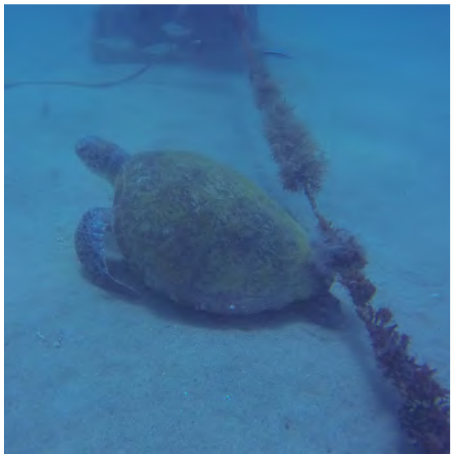
As the divers exited the water onto the beach, their mesh bags were collected and weighed. The rubbish was then sorted into debris categories and types in accordance with Project AWARE's methodology. The total weight of the rubbish was 35.9kg. It included aluminium cans, plastic bottles, plastic bags, fishing nets, rope and an old anchor. Sadly we also found a large dead crab trapped in one of the nets and several dead fish. We recorded all of the data and then carefully disposed of the rubbish before sending our detailed online report to Project AWARE.

CONCLUSION

This was a very rewarding day for all concerned. We had made a real contribution to cleaning up the marine environment and provided valuable information to Project AWARE. We are looking forward to seeing the turtles enjoying their cleaner habitat on our next dive at the Reef Balls!

Many thanks must go to all of the divers, Al Boom Diving, EDA and Project AWARE.


PROJECT AWARE
EDA
جمعية الإمارات للغوص
Emirates Diving Association
Al Boom Diving Club
Le Meridien Hotel
Al Boom
Dive Centre
Rocks
180 m
Sand Berm
Depth 5 m
230 m
Two Sand Berms
25 m
Rope
Reef Balls
Depth 10 m
25° 13' 20.00" N
56° 22' 01.50" E
Rocks
180 m
Sand Berm
Depth 5 m



GIVING SOMETHING BACK – CLEAN UP DHOW TRIP

FEATURE **STEVE WOOD – INDEPENDENT INSTRUCTOR**

THE BEACH CLEAN UP

Having dived and taught in the UAE for nearly 9 years now, I have always trained divers on the regular dhow trips I organise that they should practise environmentally friendly techniques – pick up rubbish, control your buoyancy, avoid touching or harming the marine life.

This year we decided to run a specific trip and do a clean up activity. After discussing it with Al Marsa, Soheir and their team, Al Marsa very generously offered us the use of their Yellow Dhow for the trip completely free of charge!

We soon had 15 excited divers signed up and in late July we headed out for a 4 dive weekend that would also include a beach clean up in the Musandam area.

We recognise that the Musandam is generally very clean and we are fortunate that the sites we visit are in extremely good condition. However, there is always rubbish to be collected on any dive site and the currents and tidal patterns will naturally wash things ashore.

We decided to focus on the sites dived more regularly that have a lot of boat traffic. So we selected Lima Rock, Ras Lima and The Caves for our clean up.

The divers were briefed on what to remove and what should be left alone. Ripping an old rope from an area that has been there for a long time, does more harm than good! Kitted out with knives and cutting tools, collecting bags and gloves, the divers were split into teams with designated areas to cover. Each team decided how they would conduct the dive, who would collect, who would gather and who would handle the bags collected, etc.

On day one, we undertook clean up dives on Lima Rock North and Ras Lima. I was unsure whether we would collect much rubbish, but it's amazing how once you are focused on looking, you notice much more than you normally would. Generally we found lots of old fishing lines (filament line never degrades), plastic ropes and plastic bottles. We also removed anything we spotted floating on the surface. On day two, we dived Lima Rock North and The Caves, again collecting a significant amount of debris.

We calculated that from the 4 dives we had collected an excess of 30kg of rubbish.

On day two we also visited one of the beaches near The Caves. From a distance the beach looked pretty clean, but when we arrived it was clear a lot of rubbish had washed up onshore. We set about clearing up and collecting and after an hour we had 7 large black bags full of plastic and general waste! Bizarrely, we found a large number of florescent light tubes washed up. And of course, the obligatory old training shoe! We collected at least another 30kg of rubbish by the end of it.

The weekend had been a huge success and all the divers felt they had contributed something to keeping the Musandam beautiful. It also raised their awareness and I am certain that in future, collecting bags will remain in BCD pockets on every dive to pick up any rubbish found.

Many thanks to all the divers who worked so hard and collected so much. You should all be very proud of your efforts. And of course particular thanks to Soheir and all the team at Al Marsa for supporting us in being able to run the trip.

NAUI GREEN DIVER INITIATIVE: A NEW BEGINNING

2014 Trashy Diver Contest; Photo by Len Mason


Photo by Ramon Dominguez

In April 2010, NAUI Worldwide, in association with the Disney Worldwide Conservation Fund, formed the NAUI Green Diver Initiative, Inc. (GDI) – an online community of individuals working together to make a significant difference in the preservation, conservation and protection of our aquatic environment.

NAUI GDI members are more than avid divers, environmental activists or just beach walkers; they are individuals who share a common concern for the vitality of the aquatic world. Members wholeheartedly preserve and conserve the quality of our aquatic environment through individual initiatives.

For the past five years, the NAUI Green Diver Initiative has helped sponsor a select number of NAUI member-driven projects around the globe, including:

- Sponsoring the annual Trashy Diver Contest, in partnership with Roddenberry Adventures, to provide administrative services, support and prizes for debris removal from aquatic environments around the world.
- Supporting the Hong Kong Recreational & Technical Diving Group's 2012 International Underwater Cleanup Day.
- Supporting Sarasota Bay Watch events including the Sister Keys Clean-up and Scallop Restoration Projection.
- Grant provided to the Colorado River Foundation for the 2012 Lake Travis Underwater & Shoreline Cleanup. Over 1,000 volunteers removed 3.6 tons of trash and debris from the lake and shoreline.
- 2011-12 and 2013-14 International Poster Contest for Youth sponsor; with plans to continue to sponsor for 2015-2016.

Every year across the world, NAUI member-driven projects continue to grow in number and significance. However, the potential that GDI comprises to support these programs has not been fully realized.

"Our members are looking to NAUI and the Green Diver Initiative to support and promote their hard work," said NAUI Services Group Interim Executive Director Dallas Edmiston.

"NAUI listened and has made a commitment to develop the NAUI Green Diver Initiative as an essential resource for divers who want to create a clean and healthier aquatic world," he said.

Sam Richardson joined the NAUI Green Diver Initiative in July of 2015, becoming the first manager to take charge of advancing its mission. "Sam brings over 10 years of non-profit experience and will lead the effort to foster a more vibrant and impactful organization," said Edmiston.

"I am thrilled to join the NAUI team and look forward to working with our members to help grow their NAUI Green Diver Initiative," said Sam Richardson.

"With the support of our dedicated NAUI members all across the world, the NAUI Green Diver Initiative will grow into a valuable resource. Our members have a genuine desire to develop projects that will make a positive impact on our environment. GDI will be here to help support and empower divers to make positive, global changes, at a grass roots level," he added.

In an effort to promote open communication between our members and GDI, improvements to the NAUI Green Diver website and social media pages will begin to roll out in the coming year.

"The capability for our members to not only share their progress, but communicate with other members, is essential for this online initiative to flourish," said Richardson.

The NAUI Green Diver Initiative is a U.S. registered 501 (c) (3) non-profit that relies on the generous support of donors to fulfill its mission.

For more information about the NAUI Green Diver Initiative, visit: **www.naui.org/GreenDiver**

GREEN DIVER INITIATIVE PLEDGE

As a NAUI Green Diver, I will:

- Promote environmental awareness and help others see how aquatic ecosystems interrelate and how human actions can disrupt or preserve them.
- Practice and foster positive impact diving behavior and minimal impact water skills.
- Model my own behavior to be true to this pledge, including disposing of waste, not extracting underwater souvenirs, and/or interfering with aquatic life.
- Help others fine-tune their water skills to minimize damage to aquatic life.
- Promote aquatic conservation activities and continue my education through participation in such programs.
- Look for opportunities to form habits that benefit the aquatic environment, and share them with my fellow Green Divers so that together we can make a greater positive impact.
- Use my Green Diver log to keep track of the refuse that I remove from aquatic environments.
- Encourage others to become members of the Green Diver Initiative, and strive to convince everyone to adopt the principles of green diving.
- Choose service providers that participate in the Green Diver Initiative, and display the Green Diver Initiative logo.

NAUI® Green Diver Initiative™

A BUCKET FULL OF EXPECTATIONS

FEATURE PATRICK VAN HOESERLANDE ILLUSTRATION PETER BOSTEELS

This sensation disappeared the moment the bucket stubbornly refused to go any deeper. Although he hung onto the bucket with all his weight, he did not go any deeper. As the window was not underwater, he could not see anything.

"Dive!" Fred shouted to him, "Dive!"

But no matter how hard he tried, the bucket would not go under. In his frustration, he made the bucket tilt and then the air in the bucket escaped and water poured in. The space in the bucket was immediately filled and under Skubba's weight it sank to the bottom. A few seconds later Skubba resurfaced.

"I cannot see anything! That bucket is not working," he complained to Fred. "I cannot get it underwater even by hanging onto it. With the lunch box, I at least saw SOMETHING!"

"You are not heavy enough. You have to be much heavier to get the bucket underwater. Remember how much force you had to use to push your glass down in the sink? Well, for this big bucket we need more weight."

Before Skubba could react, Fred had disappeared out of sight.

He did not know Fred had gone to look for anything that was heavy that he could carry: a big stone, a metal pipe, even a part of a train track. He loaded everything up into a wheelbarrow along with a cutting tool and rope and returned to the waterside.

Skubba was still trying to immerse the bucket. Only when he sat on it, was he successful. But, of course, that way he couldn't see anything.

"Give me the bucket!" Fred called out to him.

He made three holes in the bottom of it. In fact the top, as he was holding the bucket upside down. He put the rope through the holes and at the end of the ropes he fixed the extra weight. Once he was finished, he dragged everything to the side and threw it into the water.

"OK!"

"OK?" Skubba replied while he looked on at the bobbing bucket.

WITH A VIEW OF WATER

FEATURE PATRICK VAN HOESERLANDE ILLUSTRATION PETER BOSTEELS

The bucket with the ropes and the weight was now floating on the water's surface, but the window was no longer visible. That looked good! Skubba understood the intentions and jumped in. He inhaled a breath of air and dived. Fred looked on and saw the bucket moving up and down and occasionally it turned. What was happening underwater?

With much noise, Skubba surfaced. Thrilled, he told Fred that he could now see underwater. He could really see. He even thought he had seen a fish. He was not sure, but it could be! He rambled on. Before Fred could say anything, Skubba was back under.

He took a good breath of air in and found his way between the ropes and stuck his head into the bucket. Once there, he could breathe just fine. He could even see to the left and right when he used his hands to turn the bucket. He could go on for hours. And that's what he did. Again and again.

After a while, he began to feel light-headed. Some dives later, this turned into a headache. Despite the increasing pain, his enthusiasm stayed high. Though, he knew that after a while he would be forced to stop.

Only after the tenth, or was it the twentieth dive, he surfaced to ask Fred if this was normal. His friend told him about some ox gas he inhaled and cardboard boxes he exhaled. After a few dives, the air in the bucket would contain too much of that cardboard. He did not know where that cardboard came from, but he knew by now that if his friend told him something, then it was true. Fred would somehow find a solution for this too.

And yes, Fred had a simple solution: they had to make sure that the air in the bucket was regularly refreshed. This could be done by picking up the bucket and turn it upside-down. Oddly, Skubba had to collect fresh air by keeping the bucket in an upside-down position. But due to the weights hanging on the bucket, this proved a difficult task. The first attempts all ended up with a bucket full of water. Yes, the cardboard was surely out of the bucket but the ox gas was out too.

"Fred? Why don't I see the cardboard in my bucket?"

"Why do you ask that?"
"Well, my father has a whole collection of stuff in cardboard boxes in the garage. You cannot miss them. Why can't I see cardboard in my bucket then?"

"Why would you see cardboard?"

"Well, I exhale the cardboard box that we are trying to get rid of."

"Ah, the carbon dioxide! You misunderstood me, this is not a cardboard box, but a gas. Air is a mixture of nitrogen and oxygen. We need oxygen to live. In air without oxygen, we suffocate. The oxygen we use turns into carbon dioxide. Too much of that gas, gives you a headache."

It began to make more sense to Skubba. "So if you breathe the same air for a long time, you will use up all the oxygen and you're left with only nitrogen and carbon dioxide. You then get a headache and may suffocate. Is that right?"
"Yes, that's right."

"Then we have to find an easier way to refresh the air than turning the bucket."
"Yes. Indeed."

"But how, Fred? Fred!!!" Fred was gone, again. How could he turn that bucket around without water coming in?

INDIEGOGO CAMPAIGN TO FUND TOUCH TANKS FOR OCEAN EDUCATION

It is shocking that just like in Haiti, 50% of school children in Los Angeles have never put a toe in the ocean, even though it's our city's "backyard." How can we expect future generations to preserve something that they know nothing about?

We intend to expand our education program by reaching out to underserved students in the Los Angeles Unified School District, bringing thousands of these kids to our new headquarters in Fisherman's Village in Marina del Rey to learn about California and tropical marine life through touch tanks and interactive learning.

Together we can provide Hands-On Ocean Education for Underserved School Kids in Los Angeles!

Visit the campaign page at **www.indiegogo.com/projects/aquaria-and-touch-tanks-for-ocean-education** for more details and to contribute.

REEF CHECK MALAYSIA AND SSI

ANNOUNCE COLLABORATION TO PROMOTE CORAL REEF AWARENESS

PHOTOS **REEF CHECK MALAYSIA**

Reef Check Malaysia (RCM) and Scuba Schools International (SSI) have announced a collaboration to raise awareness of coral reef conservation issues among student divers.

A five point Action Plan has been established to provide a framework for the collaboration. The focus of the Plan is to help instructors and dive schools to efficiently deliver specific information on good conservation habits to student divers. Dive instructors will be provided with easy-to-use tools designed to encourage reef-sensitive behavior.

Julian Hyde, General Manager of RCM said: "Divers are natural ambassadors for coral reefs. However, dive training currently focuses on technical skills and meeting performance requirements. Our goal is to improve the content of conservation-related materials at the initial training stage, to ensure that divers start off with the right attitude to reef conservation. We are hoping that this new approach will introduce a missing element: respect for the marine environment."

Given that the materials will be used at the initial training stage, the SSI approach to training is ideal. According to Nick Khoo, SSI Director of Operations – Malaysia, Singapore and Brunei: "SSI encourages instructors to be creative and use additional materials to deliver appropriate messages. So this new collaboration fits with the existing training philosophy, increasing the chances of success."

But it doesn't end there. According to Hyde: "There are lots of certified divers out there who didn't receive much information about reefs and conservation issues when they completed their training, so many are unaware of the impact – both positive and negative – that they can have. These new materials will therefore have the dual purpose of promoting better habits among certified divers, too."

The Plan also provides for new initiatives in the future, such as RCM and SSI working to encourage divers to move beyond just entry level "conservation-related specialties". Nick Khoo says: "SSI has an Ocean Ranger specialty course; we are hoping that once their interest is aroused, we can encourage divers to move on to the more detailed Reef Check EcoDiver course, to learn how to participate in reef monitoring and really make a difference."

And according to Hyde, it doesn't have to end with diving. "Why not encourage people to apply the same conservation and sustainability lessons to the rest of their lives? All of us can do more to reduce our personal impacts, whether it means leaving Nemo in peace while diving, or reducing water and electricity consumption in the home. Every little bit counts."

NEW EXPEDITION AND KICKSTARTER CAMPAIGN PUTS FOCUS ON CHANNEL ISLANDS


Photo by Chris Glaeser

Reef Check has launched a Kickstarter campaign to fund Reef Check California surveys of the Channel Islands.

Channel Islands National Marine Sanctuary, located off the coast of Santa Barbara and Ventura counties in California, is one of 14 federally designated marine protected areas in US waters. The sanctuary surrounds Channel Islands National Park, a remote area, which contains 175 miles of undeveloped coastline. The islands are situated in a unique position, located where cool nutrient-rich waters from the north converge with warmer currents from the south, and provide an environment for a variety of endangered species, thriving kelp forests and sensitive habitats not found anywhere else along the California coast. The northern Channel Islands are home to the largest aggregation of blue whales in the world with approximately 10% of the worldwide population visiting their waters in the summer months.

Over the past ten years, Reef Check has collected a tremendous amount of data on the marine life at 16 survey sites at Anacapa, Santa Cruz, Santa Rosa and San Miguel islands. In the past, these surveys have been conducted with much smaller vessels (and much smaller teams of divers). Unfortunately, in the past few years some of these vessels have gone out of service while the ones that remain lack the capability to reach to the more remote sites on some of the outer islands. Money from this campaign will go toward chartering a larger vessel which can accommodate 30 Reef Check California trained citizen scientists for a multi-day survey expedition with an extended range, being able to reach even the most distant islands. This opportunity to stay at sea for an extended period of time with a large group will allow us to maximize our efforts and resources to survey as many sites as possible during our expedition.

The information we will obtain from this expedition is severely needed. The Channel Islands are a gem of the California coast and due to the rich ecosystems and numerous endemic species, they are sometimes referred to the Galapagos of California. Fortunately, a number of protections have been placed on these islands, including the Channel Islands National Marine sanctuary, established in 1980, and a network of Marine Protected Areas (MPAs), established in 2003. These protections limit destructive practices in the Sanctuary and MPAs – comparable to underwater state parks – limit the area in which fishing and other consumptive uses occur, making these waters some of the most pristine in the state. But even the current measures cannot protect against global ocean stressors like climate change, plastic pollution and invasive species. The recent oil spill near the islands along the coast of Santa Barbara is a pertinent and sad example of how even protected waters can be impacted by accidents. In recent years, a number of disturbing trends have been observed along our coast. Sea star wasting disease has devastated populations of several species of sea stars at the Channel Islands. The loss of these animals may have repercussions throughout the food chain. Additionally, invasive species of algae have been seen at these islands in increasing numbers coinciding with several warm water events of the past years. With an El Nino very likely to hit California later this year, ocean temperatures are poised to remain warmer than usual, further impacting the sensitive Channel Islands ecosystem. These and other issues make it so important that we collect this data, to get a better idea of how these ecosystems are changing so that scientists and marine managers can make the right decisions to protect this unique habitat.

Our goal is to document what is happening beneath the waves along the 175 miles of undeveloped coastline along the islands. We will lead a team of trained volunteer citizen scientists to scuba dive and survey fish and other species using scientific protocols that are integrated with studies being done throughout the rest of California. At each place we stop, a team of roughly two dozen volunteer scientific divers will enter the water, and using well established scientific protocols, will count fish, invertebrates and seaweed to come up with a comprehensive picture of what the marine life along these islands looks like. The data we collect will be made available through our online Global Reef Tracker (**data.reefcheck.org**) so that fisheries managers, researchers and the public can view and analyze what we find.

In addition to all the biological data we plan to collect, if this expedition is funded, our goal is to document the work and the ecosystems we find using Google Ocean's latest specialized underwater camera to take panorama or "underwater street view" photos. We will upload these to Google Maps to help raise awareness of the conservation issues in this unique environment. Climate change, plastic pollution, invasive species, oil spills, large scale marine disease – our oceans are changing. Please help us respond to these changes by gathering the information necessary to adapt our management of these unique waters.

Visit **http://is.gd/8phLvG** to contribute to the campaign. Booking information for the expedition can be found here: **http://is.gd/UKAeZs**.

REEF CHECK EGYPT
COMPLETES 19th SURVEY OF NORTHERN RED SEA

PHOTOS **RED SEA ENVIRONMENTAL CENTER**

From February to April 2015, the Red Sea Environmental Center in Dahab, Egypt welcomed and trained more than 10 volunteers to carry out the nineteenth global survey of coral reefs in the northern Red Sea. German, Austrian, Spanish, Dutch and Swiss volunteers joined this project in order to get involved in the protection of the breathtaking underwater world. In collaboration with the Sinai Divers Backpackers and under the scientific supervision of Nina Milton, the multinational team collected data at six dive sites in the Dahab area at different depths (5 and 10 meters).

The Dahab Reef Monitoring Project began with a few presentations and lessons on Reef Check indicators. Additional indicators and impacts specific to the South Sinai region and the northern Red Sea were included. Twice a day, our team carried out underwater identification exercises to become familiar with the relevant fish, invertebrates and substrate types and to learn to recognize signs of coral disease, predation and breakages. After some buoyancy training and calibration dives, we were prepared to conduct the surveys. It was a great experience to observe and recognize so many things underwater that we normally wouldn't even notice. We were very lucky on our dives; we saw turtles, nudibranchs, napoleons, giant morays, barracudas, various rays, and much more. However, the most amazing experience occurred during a survey at the Blue Hole when we saw a baby whale shark swimming peacefully along the reef!

All in all, the results show that most fish indicators, except for butterflyfish and surgeonfish, are absent or in low numbers. Few invertebrates were recorded, except for long spined sea urchins and giant clams. However, most of the giant clams measured were small in size. Few bleached corals were observed, but at some sites, damage to coral was frequent. It was very interesting to compare dive sites with low to high levels of anthropogenic impacts. At one of the favorite dive spots of our team, Abu Helal, the hard coral cover exceeded 50%, which is relatively high in comparison to the rest of the sites in this area. The absence of infrastructure, restaurants, or hotels in proximity to this site could be one of the reasons for the healthy condition of the reef. In contrast, the heavily dived site of Moray Garden, which only has 22% hard coral cover, suffers from a significant amount of coral damage (breakage and abrasion). Before carrying out the surveys, we tried to predict the situation we would find underwater by observations on land. It was surprising to discover that our expectations didn't always match reality. For this reason, we realized how important it is to keep conducting Reef Check surveys!

REEF CHECK
DOMINICAN REPUBLIC ANNOUNCES ITS ENVIRONMENTAL MARINE GASTRONOMIC CERTIFICATION

In May, Reef Check Dominican Republic presented the details of "Aqua Check," its innovative Environmental Marine Gastronomic Certification program. It was created this year so that businesses associated with the selling of fish and shellfish could employ sustainable and environmentally responsible practices and actions, and at the same time comply with existing national regulations like seasonal bans on capture of marine species.

"Aqua Check" encourages sustainability in business and the use or selling of prime marine products. The program will provide education and training for employees of involved businesses. It will also monitor and maintain environmental practices through both regular audits by capable verifiers and surprise inspections by undercover clients/ buyers, all of whom will have been trained by Reef Check DR.

Rubén Torres, president of the Reef Check Foundation Dominican Republic is excited about "Aqua Check" because it will spawn greater levels of knowledge and respect for marine species as they go through different stages of reproduction, as well as help expedite the compliance and enforcement of national and international regulations.

For further information regarding "Aqua Check," please write to **info@reefcheckdr.org** or call 809-227-4409.

REEF CHECK CALIFORNIA
READY TO MONITOR EFFECTS OF
REFUGIO OIL SPILL

The tragic recent oil spill at Refugio State Beach is a prime example of why Reef Check's long-term monitoring along the California coast is so valuable. Without information about the reef ecosystems, we would not be able to understand the impacts accidents like this might have on our environment. Since it is impossible to know where accidents like the one at Refugio will happen, a large network of sites is necessary to establish baselines of the ecosystem conditions along our coast. Reef Check California's monitoring site at Refugio State Beach was established as a Reef Check site in 2006. Since then, Reef Check California teams of divers have been monitoring the kelp forest community of fish, invertebrates and algae every year and they have completed 13 surveys over the last 9 years. The reef supports a relatively dense kelp forest compared to other sites along the Santa Barbara coast and in the northern Channel Islands. The rocky seafloor is mostly low relief bedrock substrate that is covered in a layer of understory brown algae which provides habitat for many fish and invertebrate species. Sea urchins and giant spine sea stars were some of the most common invertebrate species at this site until the sea stars were wiped out by the recent sea star wasting syndrome. Common fish species at this site include surf perches, such as the black perch and striped perch. We also commonly observe blacksmith and senoritas at Refugio. Other monitoring sites along the Santa Barbara coast that are monitored by Reef Check are located in the Naples and Campus Point MPAs. Reef Check volunteers are ready to survey and we are making every effort to monitor these sites again as soon as it is safe to do so.

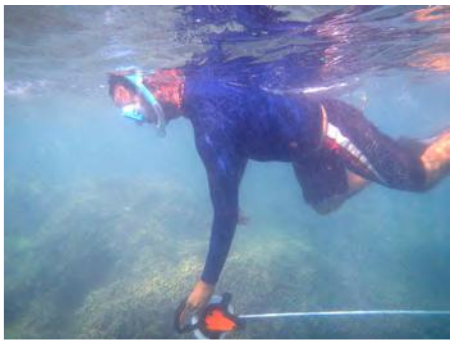
Check out this flyer from our partners at Ocean Science Trust for more details of post-spill monitoring efforts: **http://is.gd/WtmLgt**.

RENAISSANCE OF REEF CHECK FRENCH POLYNESIA
PHOTOS **REEF CHECK**

Historically, Reef Check has been a major program in the French Overseas Territories with French Polynesia being a major focus. Some of our best and most active Team Scientists, Trainers and Instructors have been based in these far-flung locations such as Reunion, a small island near Madagascar in the Western Indian Ocean, and Guadeloupe in the Caribbean. Recently Dr. Jean Pascal Quod has pushed to reinvigorate the programs throughout French-speaking countries and territories.

In late May, an initial Training of Trainers workshop was held in Moorea hosted by the new Reef Check French Polynesia Coordinator, an NGO called "Te Mana o Te Moana," in cooperation with the Ministry of Environment and CRIOBE. The primary RC Instructor was Harold Cambert, who is also from Reunion and has developed French language materials. The trainees were from the Moorea-Maiao municipality, Te Mana and CRIOBE, the local French marine lab. The newly trained Reef Checkers will be carrying out surveys of Moorea to start and then the plan is to expand their existing prize-winning student education programs to include high school students with a focus on Reef Check.

We would like to thank all the sponsors and supporters of the program and especially Dr. Cécile Gaspar, Présidente of Te Mana o Te Moana, Research and Conservation Coordinator, Matthieu Petit, the local government, IFRECOR, Ministry of Environment, Harold Cambert, Dr. JP Quod, Air Tahiti Nui and the Intercontinental Moorea Resort and Spa.



FEATURE CREATURE
GREEN SAWFISH (*PRISTIS ZIJSRON*)

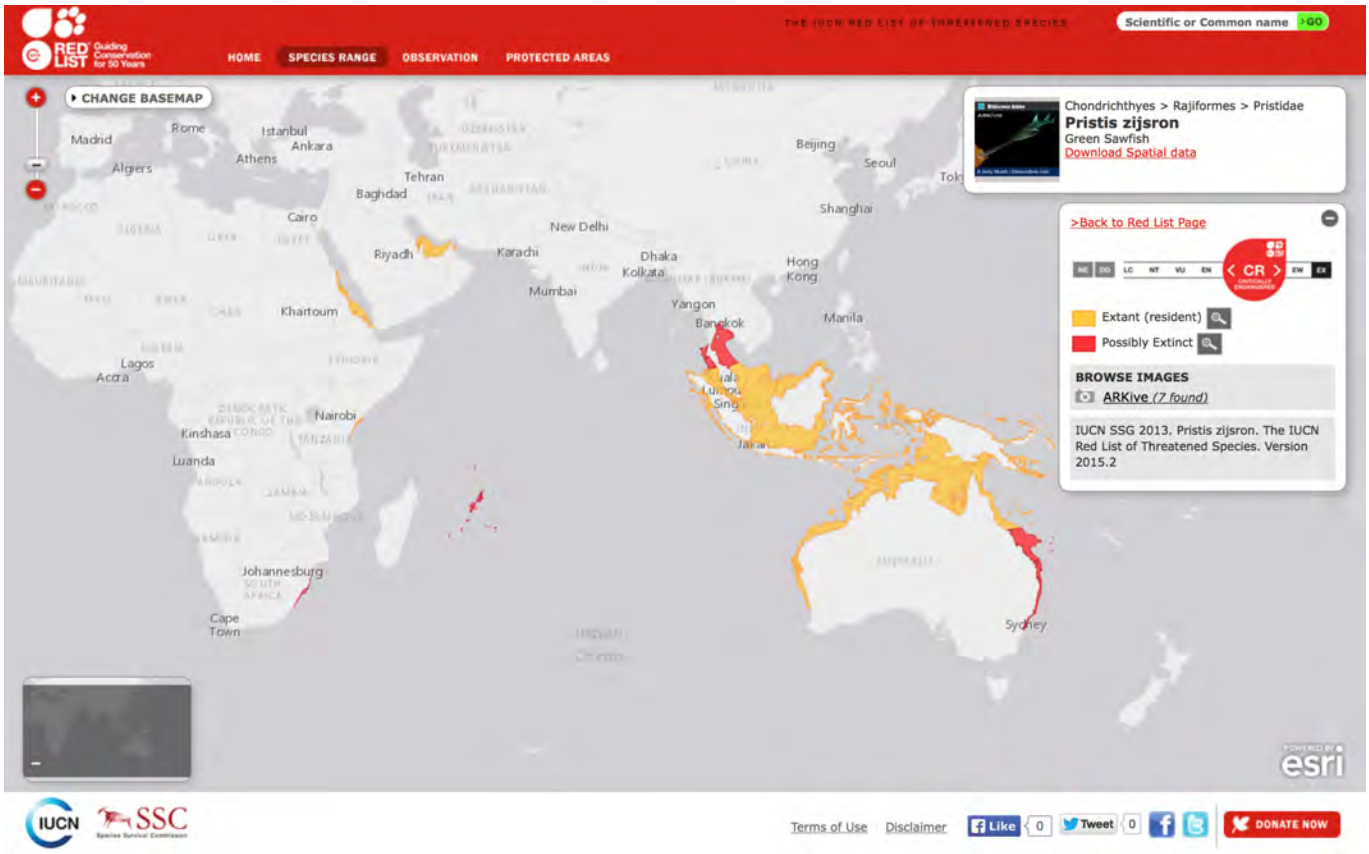
FEATURE **IUCN RED LIST 2015.2** PHOTOGRAPHY **ANDY MURCH – WWW.ELASMODIVER.COM**

RED LIST CATEGORY & CRITERIA: CRITICALLY ENDANGERED
Scientific Name: *Pristis zijsron*
Common Name(s):
English: Green Sawfish, Olive Sawfish, Narrowsnout Sawfish, Longcomb Sawfish
French: Poisson-scie
Spanish: Pejepeine, Pez Sierra

Justification: The Green Sawfish (*Pristis zijsron*) is probably the largest of the sawfish species, reaching lengths in excess of 7m, although currently lengths greater than 6m are rare. Historically, it occurred widely in the Indo-West Pacific from southern Africa to Australia and Taiwan, including the Red Sea, Persian (Arabian) Gulf and some of the Indian Ocean islands. The Green Sawfish is a coastal species, with the young occurring in shallow nearshore waters, while the adults are more common offshore in waters to >70m. Its life history is poorly known, with data from the Gulf of Carpentaria (northern Australia) indicating that it has low intrinsic rates of population increase, making its resilience to fishing pressure low and its recovery from depletion slow. While the current population size and historic abundance is unknown, it is suspected as having declined in all of its range states. In Australian waters, its range has been well documented to have contracted significantly. Like all sawfishes, the toothed rostrum and demersal occurrence makes Green Sawfish extremely susceptible to capture in gillnets and demersal trawl nets. Historically, the population has been negatively affected by commercial net and trawl fisheries which operate in inshore areas throughout most of its range, the cumulative impacts of which have led to population declines. This species is now protected by no-take status in some range states (e.g. Australia, Bahrain, India), is listed on Appendix I of CITES, and is protected by some areas that are closed to fishing; but these actions alone will not be sufficient to ensure its survival in most regions. Despite a lack of quantitative data to support declines, available information indicates that populations of Green Sawfish are considerably rarer than historically across its entire range. Australia has some of the last remaining viable populations of Green Sawfish in the world, albeit at significantly reduced levels. Declines in the population are suspected to exceed 80% over three generation lengths (~44yr), and it is possible that there has been localised extinction in a number of range states due to intensive fishing, reducing its extent of occurrence, and supporting its listing as Critically Endangered.

History:
2006 – Critically Endangered
2000 – Endangered

Range Description: Green Sawfish have a broad Indo-West Pacific distribution, from South Africa north along the east coast of Africa, through the Red Sea, Persian (Arabian) Gulf, southern Asia, Indo-Australian archipelago, and east Asia as far north as Taiwan and southern China (Fowler 1941, Blegvad and Løppenthin 1944, Smith 1945, Misra 1969, Compagno et al. 2002a, 2002b, Last and Stevens 2009). This sawfish may be the most tolerant of cooler waters, and as such has the most pole-ward distribution of all of the sawfish, at least in the southern hemisphere. For example, in Australian waters this species historically occurred as far south as Sydney on the east coast, while the limits of other species are much farther north. The Red Sea and Persian (Arabian) Gulf are regions of presumed historic abundance (M. McDavitt pers. comm. 2012, A. Moore pers. comm. 2012, R. Jabado pers. comm. 2012), as is the northwest of Australia (Morgan et al. 2011). Its current occurrence in much of this range is uncertain due to a lack of reliable data, but it is presumed to have been extirpated from much of this area because of intensive inshore gillnet and trawl fisheries.



Countries: Native: Australia (New South Wales – Possibly Extinct, Northern Territory, Queensland, Western Australia); Bahrain; Eritrea; Indonesia; Kenya; Malaysia; Papua New Guinea; Qatar; Sudan; Timor-Leste; United Arab Emirates.
Possibly extinct: Mauritius; Réunion; South Africa; Thailand.
FAO Marine Fishing Areas: Possibly extinct: Indian Ocean – eastern; Indian Ocean – western; Pacific – northwest; Pacific – southwest; Pacific – western central.

Population: Data from northern Australia shows low to moderate levels of genetic diversity, with the lowest genetic diversity in the Gulf of Carpentaria. Populations in Western Australia and the Gulf of Carpentaria are distinct genetic stocks, with the remnant east coast population potentially also forming a distinct population (Phillips et al. 2011, Phillips 2012). Genetic data is not available for the remainder of the range, but given the Australian data the global population is likely to consist of a number of stocks.

There are very limited data available on the size and trend of the Green Sawfish population, either at the global or national scale. In Australian waters, all sawfish species have undergone significant, albeit largely unquantified, declines; the southern extent of the range of Green Sawfish on the Australian east coast has contracted from Sydney, New South Wales (NSW), to the Whitsunday region of Queensland (Harry et al. 2011). The last records from NSW were in 1972 (NSWDPI 2007) and in Moreton Bay (Queensland) in the 1960s (Johnson 1999). Extensive surveys of fish landing sites throughout Indonesia since 2001 have failed to observe this species (W. White pers. comm. 2012), suggesting that its occurrence in this region is now questionable. There is some evidence from the Persian (Arabian) Gulf (A. Moore pers. comm. 2012) and Red Sea (e.g. Sudan) of small but extant populations. The lack of data from surveys and fisheries in much of the remainder of its range suggests that the abundance of this species has declined significantly in most, if not all, areas, and is now at only a small fraction of its historic abundance. A population decline of >80% is suspected across the global range over the period of the last three generations.

Population Trend: Decreasing

Habitat and Ecology: Green Sawfish are most common in shallow water coastal and estuarine areas, but occur to depths to over 70m (Stevens et al. 2005). A 3.5m female tracked in the Gulf of Carpentaria (Australia) over a 27 hour period remained in shallow water (mean depth <1m) and within 200m of a mangrove shoreline (Peverell and Pillans 2004). Similarly, a 2.5m male tracked in northwestern Australia showed similar movements, remaining in nearshore waters <1.5m deep (Stevens et al. 2008). The young are known to use nearshore and estuarine areas as nurseries, and adults occur more broadly and into deeper areas as evidenced by the occurrence of large mature individuals in offshore trawl fisheries in northwestern Australia (Stephenson and Chidlow 2003).

Green Sawfish may be the largest of the sawfishes, with reports of individuals in excess of 7m total length (TL). However, most reports suggest lengths over 6m TL are currently rare. Mean size at birth in the Gulf of Carpentaria is 76cm TL, and size at maturity at 340 to 380cm TL (Peverell 2008, Last and Stevens 2009). Age and growth based on specimens from the Gulf of Carpentaria indicate that maturity is reached at about nine years, and maximum age may be >50 years (Peverell 2008). Little is known of reproductive biology. Reproduction is aplacental viviparous and litter size is about 12. Demographic models based on life history data from the Gulf of Carpentaria indicate that the generation time is 14.6 years, the intrinsic rate of population increase is very low (0.02 yr-1) and population doubling time is 28 years (Moreno Iturria 2012).

Systems: Marine

Use and Trade: The Green Sawfish is (or likely has been) utilised for its fins, flesh, rostrum (as a trophy, curio or in traditional medicine), liver, eggs and skin. The protection of this species in some range states (e.g., Australia, India) means that take is prohibited. The meat of sawfish is sometimes utilised by Indigenous communities but the extent to which these communities harvest and utilise Green Sawfish is unknown; however, it is likely localised and at a low rate. There are also anecdotal reports of Indigenous people purchasing sawfish rostra off commercial fishers, painting and then selling them (Stevens et al. 2005). There was a small trade of live animals for display in public aquaria prior to the species' listing on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). See CITES (2007) for a comprehensive overview of trade in sawfishes.

Major Threat(s): Fishing is the primary threat to Green Sawfish. The large, toothed rostrum is easily entangled in fishing nets and other gear. In particular, inshore gillnet and trawl fisheries, which are common and intensive throughout much of the range of Green Sawfish, pose the greatest threat. Sawfishes are rarely targeted in these fisheries, but are regularly taken as retained bycatch because of the value of their fins, rostrum and meat. Data from specific fisheries is sparse, and rarely if ever to species level, making conclusions about the exact extent of the threats difficult to determine.

Data for northern Australia is probably the most comprehensive and shows that gillnets were responsible for 80% of records of sawfish captures (Stevens et al. 2005). The gillnet fisheries in northern Australia that are likely, or known, to interact with Green Sawfish include the Queensland East Coast Inshore Finfish Fishery (Harry et al. 2011), Gulf of Carpentaria Inshore Gillnet Fishery (Peverell 2005), Gulf of Carpentaria Offshore Gillnet Fishery (Peverell 2005), Northern Territory Barramundi Fishery (Field et al. 2008), Northern Territory Offshore Net and Line Fishery (Field et al. 2008), and the Kimberley Gillnet and Barramundi Fishery. Prawn trawl fisheries known, or suspected, to interact with Green Sawfish include the Northern Prawn Fishery, Queensland East Coast Trawl Fishery, and smaller prawn fisheries in Western Australia (e.g. Exmouth and Onslow) and New South Wales (NSW). The species is also known from fish trawl fisheries in northern Australia (Pilbara, Gulf of Carpentaria and Northern Territory). The take of Green Sawfish in recreational line fisheries is likely to occur at low levels, and recent education campaigns in Australia have aimed to reduce mortalities associated with these interactions. Outside of Australia the recent take of Green Sawfish in fisheries is poorly documented, partly because of its disappearance from many areas.

Ecological risk assessments of fisheries in northern Australia that interact with Green Sawfish have demonstrated that this species is one of the most at-risk elasmobranch species within the region. Its large size, low biological productivity, propensity for entanglement, and high value of products all contribute to this vulnerability (Salini et al. 2007, Tobin et al. 2010). Similar conclusions can be made for similar fisheries throughout its range. More detailed assessment of trawl data from Australia's Northern Prawn Fishery indicated that the recent level of take was close to the sustainable limit (Zhou and Griffiths 2008), and when combined with the gillnet take in the same area, would undoubtedly be in excess of the level of sustainable take. As such, even in Australian waters, threats to this species are ongoing and populations are likely to continue to decline.

Green Sawfish are also taken in shark control programs in NSW, Queensland (Giles et al. 2004) and South Africa. The capture of Green Sawfish on all of these programs is now nonexistent (NSW and South Africa) or extremely rare (Queensland).

Other threats to Green Sawfish include habitat loss (particularly loss of intertidal areas, and coastal development), pollution, loss of genetic diversity and climate change. However, relative to fishing, these threats are unlikely to substantially affect global status.

Conservation Actions: Green Sawfish are fully protected in Australia by a variety of Federal (listed as Vulnerable, Environment Protection and Biodiversity Conservation Act 1999) and State legislation (Queensland, Protected [Fisheries Act 1994]; Northern Territory, Vulnerable [Territory Parks and Wildlife Conservation Act 2000]; Western Australia, Totally Protected [Fish Resources Management Act 1994]; New South Wales, Presumed Extinct). There are also a variety of specific fisheries regulations and reporting requirements in most Australian fisheries that interact with Green Sawfish. Sawfish are also protected in a number of range states, including India, Bahrain and Qatar. Although protected in these range states, the lack of enforcement or specific fisheries regulations, and ongoing gillnet and trawl fisheries, means that threats are ongoing.

The Green Sawfish is listed on Appendix I of the Convention on the International Trade in Endangered Species (CITES), prohibiting any international trade in the species. However, there is evidence that some Green Sawfish products (e.g., fins) remain in trade (M. McDavitt pers. comm. 2012).

The use of turtle exclusion devices (TEDs) is mandatory in some range states, though the benefit of these devices on sawfish is poorly quantified. In an Australian study they have been shown to reduce the catch of Narrow Sawfish (Anoxypristis cuspidata), however they and other sawfish species are still vulnerable to capture as their rostra become tangled in the body of the net (Brewer et al. 2006).

Marine protected areas within range states may also provide significant conservation benefit to Green Sawfish. Within Australian waters, areas closed to fishing include 30% of the Great Barrier Reef Marine Park, and some estuaries and inshore waters of the Gulf of Carpentaria, Northern Territory and Western Australia. Temporal spawning closures for barramundi, the target species in inshore gillnet fisheries in northern Australia, also provide substantial protection (up to three months in some jurisdictions). In other range states, areas closed to fishing also occur. There are no closures specifically to address threats to Green Sawfish. The effectiveness of all areas closed to fishing throughout the range remain uncertain because of a lack of information about the movements of Green Sawfish.

Significant conservation benefits have been gained through education. In Australia, sawfish-specific handling guidelines have been developed and distributed to fishers in the form of printed material, videos and face-to-face training. This has aimed to maximise the survival of sawfish during release from fishing gear. Given the size and morphology of sawfish, releasing sawfish can be dangerous and historically they were often killed or de-sawed to make gear retrieval safer and easier. Thus development of handling guidelines (e.g., DEEDI 2010) may have significant benefit, and are also important for fisheries that operate in range states where they are fully protected (e.g., Australia). Conservation benefit may also be accrued from more general education of the public through display in public aquaria and through educational materials about sawfish such as outreach material provided to schools and other interested groups. However, to date such benefits have not been quantified. These activities increase awareness of the importance of these taxa and the conservation challenges that they face garnering public support for conservation actions.

Citation: Simpfendorfer, C. 2013. *Pristis zijsron*. The IUCN Red List of Threatened Species. Version 2015.2.
www.iucnredlist.org

PERFECT IMPERFECTIONS – WHAT PHOTO IDENTIFICATION TELLS US ABOUT THE INDO-PACIFIC BOTTLENOSE DOLPHIN POPULATION IN DUBAI

FEATURE **AYSE DEMIRER**

One of our most important research tools utilized to understand the status of a dolphin population is photo identification (or "photo ID"). It is a powerful tool that uses pictures of the dorsal fin to recognize individual dolphins. Photo ID helps research in counting individuals in order to make estimations of the local population size as well as analyzing the population composition, social structures and migration patterns. Photo identification is also successfully used in studying other marine species such as whale sharks, manta rays and whales, but also terrestrial species such as zebras, leopards and elephants.

The UAE Dolphin Project throughout its boat-based surveys and through the 'Report a Sighting' campaign, has collected over 7,320 pictures of dolphins in the waters of Dubai and Abu Dhabi. Now with the invaluable help of volunteers, the catalogues for two species of dolphins, humpback and bottlenose dolphins, have finally been completed and we can now start gaining a better understanding of the status of the local populations.

Based on the Photo identification data we can now tell that in 2013-2014, 147 individuals of bottlenose dolphins and 31 individuals of humpback dolphins frequented Dubai waters and some of those individuals have also been re-sighted by the public. In total 89 individuals of bottlenose dolphins have been univocally recognized and included in the Photo ID catalogue. The catalogue will constantly be updated if new individuals are spotted or known individuals are re-sighted. This data provides the basis to evaluate the current status of the local dolphin populations and supports crucial steps towards the conservation of these species and the local marine environment.

But how does photo identification work? Dolphins appear to have a very similar appearance to each other and the distinction between different individuals may look impossible.

The actual shape of the dorsal fin is different in every individual since birth, but this differentiation is not enough to univocally recognize the individuals in the long term. However, through playing, fighting and external environmental factors such as predators or interactions with human related factors, dorsal fins of adult bottlenose dolphins often accumulate distinctive marks such as scars, nicks and notches. These little imperfections are at the basis of the photo ID as they are as unique as a "fingerprint" for each dolphin.

The most informative imperfections are the nicks and notches visible along the trailing side of the dorsal fin. These are generally visible regardless if a photo has been taken from the left or right side of the animal and can be seen even when photographed against the light. The more nicks, cuts and notches a dolphin has accumulated, the easier it can be recognised. Further, these types of markings generally do not significantly change over the dolphin's life and hence enables us to recognise the individual even after several years.

The dorsal fins of dolphins are very unique and help us to identify individuals. TA011 has a deep fin cut which makes it very easy to recognise it.

Some dolphins have drastic marks such as chopped fins or deep cuts. These are often the result from jet skis or boat propellers or fishing lines. Although these may be a sad sight, they make the dolphin clearly recognizable. Their frequency can also provide an indication of the level of human impact on the dolphin population.

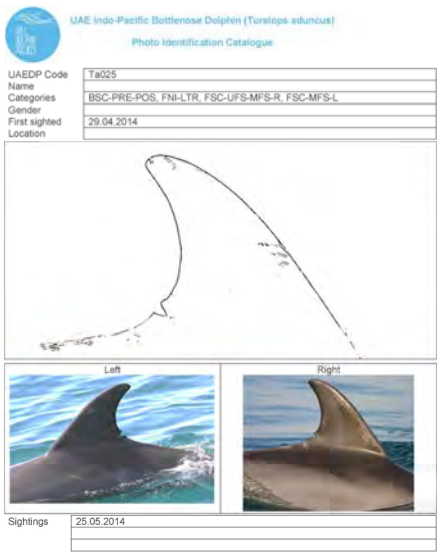
Scars and scratches can also be observed on the dorsal fin as well as on the entire body of the animal and can clearly be visible, making the individuals easily identifiable. They are generally the results of interactions with the surrounding or social interactions among individuals. However, they cannot be used in Photo-identification as they have the disadvantage of being temporary and fade with time. Also, they are generally visible only from one side of the dolphin body. Nevertheless, scars and scratches can tell us about the dolphin's story: just as nicks, cuts and notches, they might indicate that a dolphin was involved in interspecies interactions such as fighting and playing or in encounters with predators.

TOP: Tooth rakes from fighting or playing with other dolphins is clearly seen on TA066's fin but only on one side and may fade over time. BELOW: Scars like this on TA087's back are only visible from one side and cannot be used as a primary Photo ID feature.

BOTTLENOSE DOLPHINS IN DUBAI WATERS

After the analysis of all our Photo-identification data and thanks to the help of dedicated volunteers, we have now finalised our first UAE Bottlenose Dolphin Catalogue that comprises of 89 clearly photo-identified bottlenose dolphin individuals sighted along the Dubai coastline.

For each individual, the catalogue includes an



The Photo ID catalogue contains information about each individual such as sighting dates, a list of all marks and the profile of the dorsal fin.

outline of the dorsal fin ("fin print"), a left and right profile picture of the dorsal fin and a list of all visible marks on the dorsal fin and body, including nicks, notches, cuts and scars. An individual code has been assigned to each individual and in addition some very clearly marked animals have been given a name by the public.

The results are already interesting! Within just over a year of surveys, 25 bottlenose dolphins were re-sighted after their initial sightings, and for some individuals we can start telling their life story. For example, Selfie_ITP, Liv, TA016, TA019 must be great friends as so far, they have been encountered three times and always together. Pearl_DMYC, Liv, Scratchy, Paso, Fatima, TA001 and TA011 have also been spotted repeatedly together in the same group. This information can help understand the social structure and the behavior of our local bottlenose dolphin population. Sometimes the information we retrieve tells us a sad story; TA001 is a female that was first spotted in the autumn of 2013 with a new born calf. Just a few months later, she was sighted twice but both times with no calf. We can only draw the conclusion that she unfortunately lost her calf, as generally dolphin mothers stay with their calves up to 3 years. There are many reasons why dolphin calves do not survive their first year of life, so it is impossible to tell what exactly happened to TA001's calf, but recording observations like this can help us to estimate the growth and health status of the bottlenose dolphin population in Dubai.

Our next target now is to understand where the Dubai dolphins go and define their home range. Do they migrate or just travel up and down the coastline? We have compared our catalogue with the many pictures provided by the public from Abu Dhabi and other areas through the 'Report a Sighting' system, but so far we have not yet found a match.

Paso, TA001 and her calf have been sighted together in 2013. A few months later, the calf disappeared.

Help us track our dolphins and get the chance to give them a name! Have you encountered a dolphin from our catalogue? We are often able to use the photos that you send us to track the movements of known dolphins or to identify new individuals.

If you would like to help us with our Photo ID catalogue, the next time you encounter dolphins, follow these easy steps:

1) Focus on the dorsal fin and zoom as much as your camera or video camera allows.
2) The fin should be facing you perpendicularly, so both you and the dolphin's direction are parallel.
3) If you are encountering a group, try to photograph as many individuals as you can, and try to get one group picture.
4) Submit your pictures through 'Report a Sighting' and if we already know the individual, we will tell you who you have met! Any dolphin that has not yet been assigned a name, can be named by you!

We would like to thank everyone who has contributed by reporting their sightings and sending us their photos. Every sighting or photo reported is an extremely valuable contribution to our research and to support the conservation of these lovely animals!

Please **REPORT YOUR SIGHTING** at **www.uaedolphinproject.org**! Alternatively you can text (**056 671 7164**) or email the information to **sighting@uaedolphinproject.org** (Date, Time, Location and a photo if you have one) or post it on our **Facebook** or **Twitter** pages.

From left to right: TA016, TA014 and Selfie_ITP clearly illustrates the differences between dorsal fins. These three dolphins have been spotted repeatedly together as a group.

In addition to clear notches and nicks, the fin shape of TA038 is very unique.

INDO-PACIFIC BOTTLENOSE DOLPHIN
(Tursiops aduncus)

Dark grey color with falcate fin, sometimes spotted belly is visible. Robust body with a medium length beak. Approximate max length is 2.6m. Can weigh up to 260kg. Feed generally on fish and squid.

The Indo-Pacific Bottlenose dolphin is listed as "data deficient" in the IUCN Red List. Virtually any local population could be a matter of concern from a conservation perspective. In fact, populations that show high differentiation, tend to be more isolated and have a lower migration rate from neighboring areas. Therefore they are more vulnerable to local extinction. It is probably among the most recognizable of all dolphin species, with its steel grey skin tone, triangular dorsal fin and long rostrum. It is found everywhere along the UAE coastline. It differs from the common bottlenose dolphin (*Tursiops truncatus*) showing smaller size, longer rostrum and ventral spotting. However the *Tursiops* observed in the Gulf, sometimes lack some of these characteristics leaving the question open as to whether they represent a different subspecies or if both species occur. Bottlenose dolphins can be found in small groups of a few individuals but also in big groups with up to 40 individuals. They often approach boats and dhows.

YOUR EYES ON ELASMOS

FEATURE **DR. RIMA JABADO** PHOTOGRAPHY **SIMONE CAPRODOSSI**



WHO WE ARE

The Gulf Elasmo Project is a non-profit initiative working on elasmobranchs (sharks, rays, guitarfish and sawfish) in the Arabian Seas region.

MISSION

The Gulf Elasmo Project aims to advance research, education and conservation of elasmobranchs in the Arabian Seas region by promoting, developing, supporting and undertaking research and educational initiatives.

VISION

The Gulf Elasmo Project seeks to ensure the conservation and protection of vulnerable elasmobranch species by building a framework where science and education are the basis for a cooperative and collaborative approach that will contribute to the sound management of the marine environment.

A TIME FOR ACTION

The demand for shark fins and various elasmobranch products from eastern Asia has been a driver in the overexploitation of these species around the world. Studies show that elasmobranchs are extremely vulnerable to fishing pressure and once populations are depleted, they are very slow to recover. This is mainly due to the fact that most species are long-lived, slow to grow, reach maturity late in life, and produce few young. Recent work in the Arabian region suggests that current exploitation levels of many elasmobranch species are unsustainable and their depletion may have serious consequences on marine ecosystems. Yet there is still limited scientific data on most species and it is likely that without this information to support conservation measures, governments in the region will not prioritise elasmobranch protection. We need your help!

WHY REPORT YOUR SIGHTINGS?

There is currently little information on sharks and rays in the Arabian Seas region. With increasing threats from fisheries, coastal development, habitat degradation and pollution, continued monitoring of sharks and rays is essential to ensure their long-term survival. The Gulf Elasmo Project is collecting information about these species from Arabian Seas waters to increase understanding of species diversity, abundance and distribution.

Citizen science is a powerful tool to collect data from across the region. All sightings of sharks, rays, guitarfish and sawfish, whether historical or recent, can help us. Populations of most of these species are in decline so your information is invaluable to science, to raise awareness about Arabian elasmobranchs, and to support management decisions.

WHAT PICTURES TO TAKE

You do not have to be a professional photographer to submit your pictures. Any photos can help us with this project. However, to help us make an accurate identification, side images of sharks showing the whole body, and top views of rays and guitarfish, are preferred. Because male and female individuals can easily be distinguished, please try and take a picture of the pelvic area.

SOME INTERESTING FACTS

- Elasmobranchs are older than dinosaurs and have been on earth for over 400 million years.
- Mantas and devil rays give birth to only one offspring every 2 to 5 years. They are considered threatened because of the rising demand for their gill rakers.
- Many sharks and rays are highly migratory and can cross whole ocean basins.
- Elasmobranchs are worth more alive than dead.
- US $150 is the value of one manta for fisheries.
- US $1 Million is its value in tourism money over its lifetime.
- US $108 is the value of one large shark for consumption.
- US $1.9 Million is its value to the tourism industry over its lifetime.
- There are over 510 shark and 650 ray species around the world.
- There are at least 68 shark and 45 ray species around the Arabian Peninsula.
- Sharks and rays come in all shapes and sizes.
- Whale sharks are the biggest fish in the ocean and can reach over 15m in length.
- Some species of electric rays, skates and sharks measure less than 15cm in length.
- Sharks kill fewer people each year than many other animals.

REPORT YOUR SIGHTINGS

If you see elasmobranchs in these waters, please let us know.

Email us or fill out our online reporting form with as much information as you possible, including the number of animals you saw, the location, the time of your sighting and your activity at the time.

P.O. Box 29588, Dubai, UAE

Email: info@gulfelasmoproject.com
www.gulfelasmoproject.com

FOLLOW US
Facebook.com/GulfElasmoProject

GULF**ELASMO**PROJECT

YOUR EYES ON ELASMOS
Advancing research and conservation
Promoting citizen science
Using your **EYES** to make a difference

THE PROBLEM

1/4 OF THE WORLD'S SHARKS AND RAYS ARE THREATENED WITH EXTINCTION

International demand for shark FINS and MEAT is driving their exploitation

Taken primarily as **BYCATCH** or **TARGETED**

up to **73** million SHARKS killed every year

More than 20% of reported elasmobranch catches are from the ARABIAN SEAS region

90% Decline in some shark populations

TAKE ACTION TODAY By reporting your sightings of sharks, rays, guitarfishes and sawfishes, **YOU** can make a difference. Be **OUR** eyes in the field and help us advance research and conservation in the region.

Help maintain **balance** in marine ecosystems

GET INVOLVED IN ELASMOBRANCH CONSERVATION!

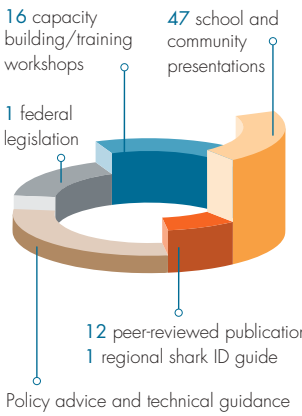
HIGHLIGHTS OF THE PROJECT

GULF ELASMO PROJECT

5 YEARS RUNNING

108 VOLUNTEERS INVOLVED

2,627 STUDENTS TARGETED



CONFERENCE PRESENTATIONS

- IRELAND
- KUWAIT
- GERMANY
- SOUTH AFRICA
- JAPAN
- CANADA
- UNITED KINGDOM

YOUR EYES ON ELASMOS

1 YEAR RUNNING

783 PICTURES SUBMITTED

156 SIGHTINGS REPORTED

NUMBER OF SPECIES SIGHTED

25

21

REPORTING COUNTRIES

- UAE
- OMAN
- IRAN
- QATAR
- KUWAIT
- PAKISTAN
- INDIA

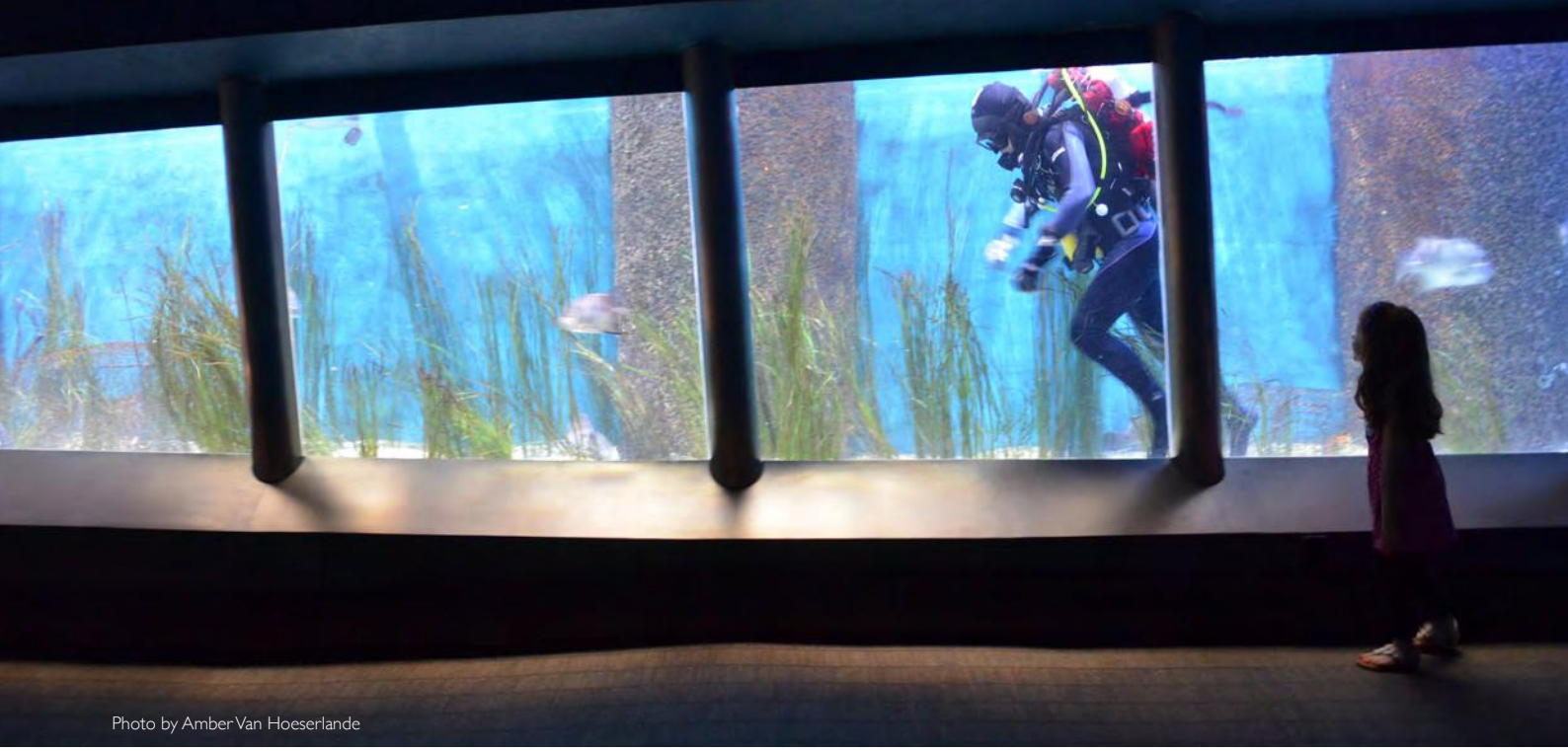


Photo by Amber Van Hoeserlande

A DIVING VOLUNTEER'S WORK IN THE VIRGINIA AQUARIUM

FEATURE **PATRICK VAN HOESERLANDE**

After my visit to the Monterey Bay Aquarium, I kept wondering about a diver's job in a public aquarium. There is only one thing better than interviewing a diver doing the work, and that is to discover it for yourself. With the Virginia Aquarium & Marine Science Center not far away, I knew what to do next: join their group of volunteer divers.

Volunteers make up a big portion of the workforce of the Aquarium. 212 employees are working next to 800 volunteers. Of these volunteers, 73 are divers. The management of the group is fairly unique within the Public aquarium industry. Staff, including the Aquarium's Dive Safety Officer, ensure the safety and dive operation compliance, as well as determine the responsibilities and duties of the volunteer divers. A core team of volunteer leaders partner with staff to support recruitment, training and scheduling of the volunteers. Together with staff divers, volunteer divers support dive operations in five exhibits. These exhibits hold, over 2.2 million liters of water and are home to over 122 species of fish. The purpose of the volunteer job is to work underwater, not to learn how to dive. Proper certification as a diver and proof of advanced dive experience is required. Proof of physical fitness to participate in dive activities and a criminal check are also a necessity in starting the program.

Divers may be highly certified with many credentials and logged dives, but every potential volunteer diver must pass a skills evaluation. This evaluation allows staff and volunteer trainers to evaluate each diver's ability to perform basic activities underwater. Nothing special, the normal things all divers should be able to do: swim underwater, hover or obtain neutral buoyancy, losing and retrieving a regulator, removing and replacing fins. This is followed by some not so normal exercises such as getting in and out of the water without splashing, and swimming figures of eight with good body trim and without touching any obstacles. All of these skills, while seemingly simple to perform, are basic necessities for any diver who expects to dive safely and effectively in an exhibit aquarium.

Upon passing the initial evaluation, all divers have to start their training in the Chesapeake Bay Aquarium, one of the Aquarium's exhibits where daily dive programs are performed for guests. Before getting wet, instructors explain the safety and preparation measures to be executed before the start of any exhibit dive operation and the actions to be taken in case of an emergency. It gave me confidence that these procedures are trained and very much stressed throughout my training and with each dive I complete. As divers, we sometimes tend to neglect standard procedures when faced with simple dives. Following good practices keeps us safe.

Besides diver safety, ample time is spent on the safety of the fish and the exhibit. As in all dives, we are just visitors in the fish's home. They have priority, we have to adapt. Whatever we do, we have to keep an eye on the permanent residents of the aquarium. Big or small, their health not only depends on what divers do underwater, but also on the strict adherence to some rules above the water's surface. Contamination of their habitat must be prevented by proper care and maintenance of our equipment and anything that comes into contact with the aquarium water and their home.

When all the procedures are reviewed and understood, training of the skills needed to be a volunteer diver begins. Every detail of it is explained and must be performed under the supervision of the trainers. After successful completion of the training sessions and the test dives, the real work as a volunteer diver begins. Although the environment is special (i.e. clear visibility, warm water, no current and a lot of curious fish), the work is important and the training ensures the work is done correctly and safely every time.

A DIVE IN A TANK

What is the work involved? Let's discover that while you follow me through a normal 'day' in the tank.

The start of the day depends on how far you have to drive, but it is most probably, like in my case, situated in a garage. Here I pack all my diving gear except tank and weight belt. Everything checked, I load my equipment in the trunk of the car and hit the road.

Around 10:30am, I arrive at the aquarium and check-in. I then go through the 'Staff Only' door and down the corridor towards the aquariums. It still surprises me everytime I go behind the scenes on how much bigger the aquariums look from the public's perception.


Photo by Amber Van Hoeserlande


Photo by Amber Van Hoeserlande


Photo by Amber Van Hoeserlande

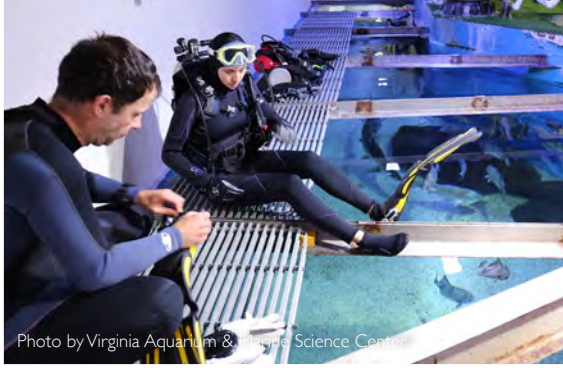


Photo by Virginia Aquarium & Marine Science Center


Photo by Virginia Aquarium & Marine Science Center

I know, Snell's law of diffraction, but I find it strange. After a chat with the tender who will be assisting me from the topside during my dive, I prepare my tank, regulator and BCD. After I've gathered my weight belt, I move my equipment to where I'll get in the water first. While tenders won't enter the water for the SCUBA program, they can join the diver later to help with the maintenance duties needed to be completed. In that case, we place their gear near the entry point too.

Following a quick change of clothes, my tender has completed the pre-dive log entries and the educator who I will be working with for the program is already waiting.

Educators are our connection to the public during the SCUBA program. We as divers are the attraction in the aquarium and we cooperate with educators to bring what they are explaining to life.

Just prior to entering the water, the senior aquarist or caregiver of the aquarium gives a short briefing to the tender and myself about what needs to be completed after the program and any information on the animals in the aquarium that can help us during our dive. This informative brief is followed by a review of the dive plan for the day. The start of the dive is signaled by a specialized radio call sent from the tender to the staff monitoring the operation, who will respond in the event of an emergency. The call goes out and with fins, belt, gloves, mask and hood on, I enter the water. Carefully lowering myself into the water from the catwalk, I break the water surface into the exhibit. I check if everything is ok and make sure that my equipment is secure. A few movements to check the buoyancy, I drop to the bottom of the aquarium and turn to the educator on the dry side of the acrylic panel. Communication between divers and educators is non-verbal during the program like in any normal dive. So with the 'OK' sign, I indicate I'm ready for the demonstration. The educator starts the program with a brief history of Scuba diving and why divers are important in the care of the aquarium's exhibits. With another signal from the educator, my part of the program begins.

The demonstration is a sequence of four simple tasks. The first is to show where the air is coming from that divers breathe by pointing to the regulator, following the air hose to the scuba tank, indicating its location on the back. Task number two is taking the regulator out and clearing the second stage so the public clearly sees air escaping. Hovering in mid water or obtaining neutral buoyancy is task number three followed by the finale of swimming figures of eight.

Sometimes a child visitor is asked to help the educator give the program. So, instead of reacting to the signs of the educator, I respond to those of the child. I can see the thrill in the eyes of the child being able to instruct some strange human fish within the aquarium. Once the demonstration is over, the best part of the job begins. We finish by entertaining the little ones who are totally amazed by our skills and giving the parents the opportunity to take pictures with us through the aquarium's acrylic panels. This is the period where we do 'high fives', shake hands and take pictures with curious and courageous children. Their thankful smiles are enough to turn a bad day great. This moment is always too short.

When the last guest leaves the exhibit, my attention turns to doing the maintenance tasks the aquarist has assigned to my tender and myself. Some of the tasks are cleaning algae from the acrylic windows and scrubbing exhibit decorations such as the pilings, the artificial oyster reef and grasses. Sometimes we need to vacuum the gravel bottom of the aquarium to remove organic debris, like uneaten food and fish feces which collects there. While we perform our duties, there are flashes from people taking photographs of what we are doing. They find it fun to watch us. I had never had so many people taking a photograph of me while diving until I became a volunteer diver! Having someone watching me while working underwater is a new experience. During my training as an inshore diver, I was always alone in the water. Sometimes with visibility, but always without a public. Interacting with the guests, even while doing my work, is very enjoyable and I always make time to wave and say hello. After thirty minutes of cleaning, our job is done. We return to the surface and leave our aquatic friends behind. One quick turn to look around to see if all is ok before I get out of the water. It's over, but I will return.

The dive is completed, but our work is not yet done. Our equipment needs to be cleaned and dried for its next use. A debriefing is always part of our duties after cleaning up. How did the demo go? Equipment issues? Special observations on the maintenance? Did the fish behave normally? We write our experiences and observations down in the aquarium's dive logbook.

A nice, warm shower concludes the dive operations for the day.

OTHER TANKS

This is the work in only one tank, the Chesapeake Bay Aquarium. The one all divers have to start their volunteer diver career in. Volunteer divers dive for at least 6 months in the Chesapeake Bay Aquarium before applying to dive in other exhibits at the Aquarium. Every aquarium is special and requires new skills to train for, safety measures to understand and new animals to dive with. Before being allowed to work in another tank, you have to go through a new training session for that tank. Isn't diving all about the training? And in this case, also about volunteering.

OCEAN, DIVING AND PAINT BRUSHES

HOW I TOOK A JOURNEY TO THE MALDIVES AND THEN THE JOURNEY TOOK ME

FEATURE AND PHOTOGRAPHY **SLAVA NOOR – WWW.LUST4OCEAN.COM**

The Maldives has been on my wish list for some time, so when I heard of the environmental event, 'One Nation Coral Revival', I knew I had to go right away. After some research, my friend and I found the perfect guest house to stay at on the small residential island of Thulusdhoo. We were set for our adventure. Little did we know how much fun it was going to be!

There is something absolutely magical about the country that is so much more than the transparent turquoise waters and the picture perfect views. It was a very exciting trip and exploring the islands has changed me both as a diver and a person.

PART ONE

ONE NATION CORAL REVIVAL

The event is organized by 'Save the Beach' and supported by the ministry of tourism who are dedicated to raising awareness to the importance of a healthy ocean, preserving coral reefs and protecting underwater marine life. The event took place on the 5th and 6th of June on Villingili island which is just ten minutes by ferry from Male. A key part of the event was submerging a 300kg coral structure underwater. Divers from the Nine Star Dive Center worked hand in hand with the Maldives National Defence Force. It was a great honor for me to be the only girl and foreigner on the landing craft documenting the event. All the guys were extremely friendly and supportive and I learnt a great deal both by talking to them and observing them work on the structure. Mohamed Azmee from the dive center was coordinating divers and snorkelers as they were preparing the structure. Adam, an engineer and a diver, explained to me how the two tanks attached on the sides of the structure would ensure a smooth descent as divers would slowly add water to them. This was like seeing a hard physics problem being solved in real life! Just way more exciting.

Once I was given a green light by Azmee, I got my gear on. A giant stride and my pink fins were underwater. I got my GoPro ready and started taking photos and videos as the guys pushed the structure into the water. Once it was in, they started adding the water to the tanks as planned until it was neutrally buoyant and a few divers started pulling it towards the location marked at 20m. It took them some time to adjust the structure as the slope made it somewhat difficult. I was swimming around and did my best to stay close as the current was pulling quite strongly away from the shore. Once the guys were done, we took some group photos and headed up. We made a safety stop by the coral nursery and we surfaced just in time to witness a breathtaking sunset. I was extremely excited and happy to take part in such an impactful project and I can't wait to be back to see the metamorphosis of the structure.

The rest of the day involved meeting people from various environmental organisations such as Manta Trust, Olive Ridley Project, Ocean Warriors and Damage Control who were all passionate about saving the ocean and stopping the pollution in the country.

PART TWO
EXPLORING THULUSDHOO ISLAND
Thulusdhoo is a residential island which means visitors get a good opportunity to experience the authentic Maldivian lifestyle. My friend and I were excited to finally relax and have more time to spend in the water and relax.

This island is also very famous among the worldwide surfing community, providing challenging surfing spots for the most seasoned surfers. Water visibility was amazing, ranging from ten to twenty meters throughout the day and I spent hours just snorkeling. Being used to diving in the Gulf, it just seemed so unbelievably clear and seeing coral reefs with such vast rich marine life was simply amazing. I enjoyed discovering all the species I knew thanks to the Reef Check training – soft and hard corals, clownfish bravely guarding their anemone homes, schools of parrotfish, colorful angelfish, sophisticated starfish and even a scary looking moray eel. There was also a group of dolphins that could be seen passing over the same spot every morning.

When I was out of the water, I enjoyed walking the streets of the island with a population of less than a thousand and a half people who were all extremely friendly and welcoming. I did not want to be just another visitor to the island and wanted to engage myself with the local community and this is how the new project was born.

PART THREE
PAINT FOR THE OCEAN
Since my background is art and photography, I really wanted to marry it with my passion for protecting the environment by working with local communities. This is how the project 'Paint for the Ocean' was born. The idea is to raise awareness of the importance of a healthy ocean by organizing workshops for children where they learn about the importance of a healthy ocean, underwater ecosystems, recycling and reflect their knowledge through art.

We got in touch with a local high school and held a four day workshop with a small group of kids aged between ten and twelve. Every day we had a new topic to discuss – students' favorite animals and their importance to the country, recycling and decreasing the use of plastic, local fishery knowledge and the necessity of a healthy ocean for international tourism. We started with painting on paper and gradually moved on to painting onto tote bags that kids got to keep and eventually to the final group canvas that was to stay at our guest house, the Dream Inn. This was truly a beautiful experience which I hope will help these children to love the ocean more, care about it and do all that is needed in future to protect it.

The way the young ocean lovers have embraced each class with excitement and hunger for knowledge, showed how successful the project could become. This was not the end of my trip but merely a beginning of a new journey. A journey that will unite environmentalists and activists who share a common vision of a saving our ocean.

To follow updates of my project, visit:
www.facebook.com/lust4ocean

DUGONGS

THE UAE'S OWN LITTLE MERMAIDS

A WORLD NATURAL HERITAGE AND A NATIONAL TREASURE

FEATURE **PAUL WARWICK**

Photo by EAD

DID YOU KNOW?

"In ancient maritime mythology, "Siren" was a Greek term used to describe the monsters or sea nymphs who lured sailors and their ships onto treacherous rocks with their beauty and mesmerizing songs with the aim of wrecking those ships and capturing the sailors. Throughout maritime history and across all cultures, sailors sometimes thought that they were seeing what we now know through folklore to be "mermaids" when they were probably actually seeing either Manatees or Dugongs. With a little (or perhaps more than and little?) imagination, the delirium brought about by a poor diet, lack of fresh food and fresh water, poor sanitation and hygiene, no female company, the harsh life of a "pressed" sailor and probably very little rest or sleep having been at sea for months at a time, both species could be seen to have an uncanny resemblance to the human form. This would be reinforced by the way in which these amazing creatures can position themselves in the water "head up" with the flippers almost looking like arms and the way in which they nurture their young in this same position almost appearing to hold them like a child. In fact, Manatees and Dugongs may have helped to perpetuate the myth or legends of mermaids across the ages – albeit somewhat ugly ones (unless of course you are another Dugong or Manatee in which case it is all relative)!"

SO WHAT ARE THEY?

Those beautiful (or not so beautiful if you are not another Dugong?), gentle, serene, family oriented creatures called Dugongs are part of the generic family called "Sirenia" which also includes "Manatees". They are also known to many as "sea cows" primarily because of their size, shape and feeding habits which involves a great deal of their time "grazing" on the sea grasses and aquatic plants in much the same way as cows do on land. Members of the extant order "Sirenia" are found in aquatic habitats throughout the tropics and subtropics. Sirenians are the only aquatic mammals that are completely herbivorous. Because of their herbivorous nature, all Sirenians are found in relatively shallow waters where sunlight can penetrate and stimulate the plant growth they need to survive. Let us not forget also that they are also air breathing mammals and like other marine mammals are intelligent, sensitive and produce "live" young which they nurture and raise in much the same way as humans.

Manatees and Dugongs are originally believed to have evolved from a wading, plant-eating animal and whilst other herbivores migrated onto the land evolving into other "legged species" that we know today, the Sireneans remained in the shallow waters retaining many of their marine features rather than adapting to needs of survival on the dry land environment. Strangely enough many associate Dugongs and Manatees with the Seal, Sea Lion and Walrus genus of marine mammals, but they have no genetic relationship at all, despite some similarities in appearance and features.

SPECIES

The current Sirenian species falls into two generic categories; Manatees and Dugongs. There used to be a third category and the largest of the species is the Steller's Sea Cow, but this is now extinct having been decimated by man for meat, oil and other products in the mid 18th Century. Being slow, almost ponderous animals and unafraid of man, they made easy prey for human hunters. However, they must have been magnificent creatures when they occupied the Arctic Ocean around Alaska 250 years ago. Geographically, the Sirenians can be divided easily, Manatees occupy the Western hemisphere up to West Africa and Dugongs occupy the Eastern hemisphere. Manatees can also be found in saltwater and the fresh and brackish waters of the Western hemisphere, whereas Dugongs are only found in salt water environments.

MANATEE ***(Trichechus)***

WEST INDIAN MANATEE ***(Trichechus manatus)***

Subspecies:

ANTILLEAN MANATEE ***(Trichechus manatus manatus)***

FLORIDA MANATEE ***(Trichechus manatus latirostris)***

Florida Manatees are found in the southeastern United States, mostly in Florida. Antillean Manatees are found in the coastal and inland waterways of Eastern Mexico, Central America, the Greater Antilles, and along the northern and eastern coasts of South America. Both Florida Manatees and Antillean Manatees can be found in salt, fresh or brackish waters and feed on marine, estuarine and freshwater vegetation.

AMAZONIAN MANATEE ***(Trichechus inunguis)***

Amazonian Manatees are found in the waters of the Amazon River and its tributaries in South America. The smallest member of the family *Trichechidae*, the Amazonian Manatee has smooth skin and no nails on its flippers and feeds on freshwater vegetation.

WEST AFRICAN MANATEE *(Trichechus senegalensis)*
The West African Manatee is very similar in size and appearance to the West Indian Manatee and lives in similar habitats. West African Manatees are found in West African coastal areas, but little is known about this species because they have not been widely studied.

DUGONG *(Dugongidae)*
DUGONG *(Dugong dugon)*
Dugongs are found in the Indo-Pacific region of the world. They have smooth skin and a notched tail or flat fluke. They feed on sea grasses and are in some areas still hunted for food by humans, despite being protected by international conventions as an endangered species. Dugongs have tusks, but these tusks characteristically erupt through the gums only in males and normally remain un-erupted in female dugongs.

STELLER'S SEA COW *(Hydrodamalis gigas)*
At one time, the Steller's Sea Cow was found in the cold waters of the Bering Sea, but it was hunted to extinction within 27 years of its discovery in 1741. The largest Sirenian on record, the Steller's sea cow grew up to nine meters (30 feet) in length and weighed around four metric tons (approximately 4.4 Imperial Tons or 8,818 pounds).

PHYSIOLOGY AND CHARACTERISTICS
Sirenian physiology is characterised by two forelimbs, called flippers, some species of which have with three to four nails on each flipper. The thick skin is a brownish-grey colour and there are short, coarse hairs sparsely distributed over the body but concentrated as bristles on the muzzle. Their head and face are wrinkled with whiskers on the large rounded snout which ends in a cleft, muscular upper lip that hangs over the down-turned mouth. All Dugongs grow tusks but these only break the skin, and therefore become visible, in mature males. The Manatees have a "rounded" tail fluke whilst the Dugong has a more conventional "flat or forked tail" fluke. Mature Dugongs can grow up to 4 metres in length and weigh anything up to 1000kgs. They can also live up 70 years so very much comparable with humans.

Genetically, the Dugong and Manatee's closest relatives are the elephant and the hyrax (a small, gopher-sized mammal) which given their size, life span, feeding habits, social structure and reproductive cycle is not entirely surprising. Thus once again reinforcing the connection between all life on earth and our oceans and the bio-diversity which exists across the flora and fauna of our "Water World".

BIOLOGY
Both Dugongs and Manatees have an extremely slow metabolic rate, allowing them to exist on an entirely herbivorous diet, and consequently they usually move relatively slowly. They have pectoral mammary glands reminiscent of human breasts. These features, and their nursing behaviour, may have caused sailors to liken them to mermaids or sirens; hence the order name of 'Sirenia'. Although most sea grass beds upon which dugongs feed occur at depths of 1 to 5 metres, they are known to feed at depths of up to 33 metres. Using the flexible upper lip to rip out whole plants, Dugongs leave characteristic furrows known as 'feeding trails' on the sea floor. Dugongs are more closely related to elephants than the cows after which they are named, and have a particularly long large intestine to aid digestion of the coarse sea grasses on which they rely.

BREEDING AND REPRODUCTION
The rate of reproduction for Dugongs is very low. Dugongs are not normally sexually mature until they are about five years old. It is believed that one calf is born to females every two to five years, and twins are extremely rare. The gestation period is about 13-14 months, so somewhat longer than that of most other marine species. Measuring over a metre in length at birth, the calf suckles from the mother for around 18 months and the mothers nurse the young for at least two years and sometimes longer. During this time a calf remains dependent on its mother for food and protection and social interaction. Within the UAE, the Dugongs population only reproduce at a rate of about 8.5% annually and this assumes natural rates of morbidity and minimal accidental deaths.

SOCIAL STRUCTURE
Dugongs are usually seen as solitary individuals or in a group of two, although larger family groups have often been recorded and on extremely rare occasions when migrating hundreds of them. The most stable and long-lasting groups appear to be mother and calf pairs. Dugongs are not territorial in the true sense of the meaning and prefer a non-confrontational life of grazing. Not much is really known about these gentle, shy, timid animals and much research is being undertaken to understand their behavior patterns, health, genetics and psychological profiles in an attempt to preserve the species for future generations.

BEHAVIOUR
Dugongs are gentle and slow-moving animals. Most of their time is spent eating, resting, and traveling between feeding grounds. Dugongs are mostly herbivorous, however small fish and invertebrates can sometimes be ingested along with a Dugong's normal vegetation diet. They eat a large variety of submerged, emergent, and floating plants and can consume 10-15% of their body weight in vegetation on a daily basis. Because they are mammals, they must surface to breathe air. They may rest submerged at the bottom or just below the surface of the water, coming up to breathe on an average of every three to five minutes. When Dugongs are using a great deal of energy, they may surface to breathe as often as every 30 seconds and when resting have been known to stay submerged for up to 20 minutes. They can swim up to 20 miles per hour in short bursts generally to avoid or escape from perceived danger, but they usually only swim about three to five miles per hour cruising the coastline looking for food.

HABITAT AND RANGE
Dugongs can normally be found in shallow, slow-moving rivers, estuaries, saltwater bays and coastal areas – particularly where sea grass beds or other aquatic vegetation flourishes. The shallow waters, low lying sandy islands, mangroves and the sandy bottom composition and the indigenous marine fauna of the UAE make the region an ideal habitat for Dugongs. Although generally considered to be a migratory species, the Dugongs in the UAE tend to migrate locally within national waters (must be passport and immigration problems?). The UAE's Dugong population is the second largest in the world after Australia and the UAE has a crucial global role in the conservation and management efforts for this species.

Within the UAE, they are primarily concentrated in the Emirate of Abu Dhabi, although much smaller populations do exist in the other Emirates and other parts of the Gulf region. The UAE protects a Dugong population of approximately 3,000, mostly in the waters around Bu Tinah Island which is part of the Marawah Marine Biosphere Reserve. This represents the densest Dugong population on the planet.

DUGONG THREATS AND MORTALITY
Dugongs have no natural enemies apart from man who through ignorance, arrogance, uncaring and just plain stupidity, affect both the


Photo by Dan Burton


Photo by Doug Perrine

habitats in which they live and thrive and even the creatures themselves. The Dugong has long been persecuted by humans throughout much of its interaction with man for its meat, hide and oil. Its rather slow movements, large size and dependence on coastal habitats have made the Dugong particularly vulnerable to both direct and indirect contact, while the low reproductive rate, long gestation and high investment in each individual offspring, means populations can take a long time to recover from unforeseen or unnatural losses and it is this which we must guard against.

The morbidity factors for Dugong beyond normal aging can be derived from the following:

NATURAL CAUSES: As with all wild animal populations, a certain percentage of Dugong morbidity is attributed to natural causes of death such as stress, gastrointestinal disease, pneumonia (believe it or not?), and other diseases. Like any other marine mammals, they are not immune to changes to their natural environment or the effects of natural pathological contaminants, nor starvation or pollution of indeed to psychological trauma.

MAN'S ACTIVITIES: Man's activities have probably had the greatest effect on the UAE's Dugong population ranging from land reclamation and dredging, to fishing methods, recreational marine activities to commercial maritime activities and pollution.

FISHING ACTIVITIES: Fishing nets, fishing lines, monofilament and marine traps have been the major cause of population decline, as Dugongs are unable to hold their breath for more than about 12 minutes and therefore easily drown once entangled. Of the Dugong carcasses found in the UAE since 2000, over 70% died as a result of drowning brought about by net or line entanglement preventing them from being able to resurface to take air.

WATERCRAFT: There are two aspects to Dugong's interaction with a watercraft and their morbidity rate; firstly accidental collisions generally by a fast moving watercraft and secondly the psychological effects of the ignorant and unknowledgeable in harassing these shy and timid creatures who want nothing more than to be left alone.

COLLISIONS: Dugong fatalities do occur from collisions with a watercraft, however the percentage is much lower in the UAE than those seen in North and Central America where this is the major cause of Manatee fatalities and injuries. Hopefully the collisions which occur in the UAE are accidental and not deliberate nor caused by negligence and complacency? If so then these individuals should be prosecuted to the full extent of the law.

HARASSMENT AND INTIMIDATION: Human interaction with these wonderful animals should be kept to the minimum and any contact should be done in such a way as to avoid "stressing" them and those with a fast, noisy craft and no sense, are a genuine threat despite the excitement of seeing these wonderful animals.

POLLUTION: Other causes of human-related Dugong mortalities include ingestion of fish hooks, litter (including plastics and other materials) and poisoning. The sea grass meadows upon which they rely for food require a delicate balance to thrive and it does not take much to upset that balance or introduce contaminants which leech into the food chain in sufficient quantities to have an impact on the physiology of the Dugongs themselves.

HUNTING AND POACHING: Believe it or not, illegal hunting and poaching are still a threat to the Dugong population here in the UAE. It is only through the leadership of the UAE, the vigilance of the Abu Dhabi Environment Agency, supported by CISPA, the Coast Guards and other environmental lobbyist and conscientious individuals, that this is monitored and controlled. But everyone can help in this battle to save one of the UAE's national treasures.

LOSS OF HABITAT: Ultimately, the loss of habitat is probably the most serious threat facing Dugongs. Feeding only on the sea grasses that thrive in the warm waters around the UAE, these beds can be affected by:

- Reclamation Projects
- Development of the islands and coastline
- Illegal dumping
- Mining and drilling operations
- Silting
- Water quality and reduction in oxygen saturation
- Increased heavy marine traffic

DUGONG CONSERVATION

All Sirenian species in the world are listed as endangered or vulnerable by the IUCN – International Union for the Conservation of Nature and the World Wildlife Fund (WWF) because of the global decrease in numbers across the entire genus. International trade in Dugongs is banned by its listing on Appendix I of the Convention on International Trade in Endangered Species (CITES). An action plan is also in place for the species which aims to study the animals in depth and ensure that conditions are provided so that they can thrive in safety and can access the most pristine grazing environment as well as minimizing contact with people leaving them alone to live their lives in the peace and tranquility they need.

However, the IUCN reports that little effective management intervention has yet been put in place to reduce the impacts of human habitation and contact on the Dugong. Measures such as the protection of its sea grass habitat will be crucial if this gentle 'mermaid of the sea' is to survive. The UAE is at the "leading edge" of both legislation, practical application and research into the protection and conservation and

management of Dugongs. Other species important to UAE include several species of dolphins, turtles, rays and banded sea snakes as well as the very unique Dugongs.

UAE CONSERVATION EFFORTS

The UAE has the second largest population of Dugongs after Australia and so has a vested interest in the conservation and management of the species, as well as developing programmes to monitor and support population growth. The UAE as a world leader in this area takes this responsibility extremely seriously and has developed international and regional links as well as enacting national legislation and studies/projects. In fact such is the UAE's commitment, the UN-CMS Dugong Secretariat is located in Abu Dhabi reinforcing their obligation to protect the species and the habitats they need to thrive in.

Some of the more specific measures the UAE have taken include:

- International Cooperation and collaboration and exchange of research information with countries in the region and others who have Dugong populations such as:
  - Australia
  - Qatar
  - Bahrain
- As a signatory of the Regional Conference of Plenipotentiaries on the Protection and Development of the Marine Environment (RoPME) – the sharing of marine environmental information
- Federal Laws 23 and 24 protect both the Dugongs and their habitat(s)
- Establishment of two Marine Protected Areas (MPAs) covering over 6500km^2
- Regulation of Fishing and Fishing Equipment – reversion to traditional methods
- Ban on the use of drift nets and shark nets
- Future Surveys:
  - Socio economic conditions of the Fishermen to ensure they have a sustainable life and are not tempted to ignore laws and regulations which affect the Dugongs and their habitats
  - Implementation of all measures in the UN-CMS (United Nations – Commission on Conservation of Migratory Species) MOU (Memorandum of Understanding) on Dugong Conservation and Management
- Satellite tagging of individuals to monitor movements and residential areas
- Genetic testing and studies of Dugong Families
- Mapping and monitoring of all the sea grass meadows
- Seasonal assessment of these meadows for composition and bio-mass
- Monitoring of water quality on a seasonal basis throughout the MPAs to check; temperatures, pH, salinity, conductivity, dissolved oxygen (O2) content, nutrients and microbes and heavy metals and other contaminants such as nitrogen and phosphates and pollutants
- Establishing Education and Awareness Schemes:
  - Establishing a programme of field trips for students and a teacher's training programme
  - Marine Clean Up programme involving government agencies and NGOs as well as volunteer organisations and educational institutes "Clean Up Arabia" PADI Project AWARE "Dive for Debris"
  - Including Dugong and other marine species conservation in schools curriculum
  - Communication with key stakeholders, including those affected by the Federal Legislation covering conservation

SO WHAT CAN YOU DO?

So the UAE nationally is doing its bit for the marine environment and for endangered species, but what can you as an individual do to help with the efforts to preserve the UAE's marine living heritage? Remember every contribution, no matter how large or small makes a difference and enough small contributions can make a huge difference – what you see, what you do and what others do can have an effect on the future of these gentle, shy and timid animals. So this how you can help:

- Reporting:
  - Report any sightings – where, when, how many, direction of travel and any other information such as calves or noticeable injuries
  - Report any watercraft which might be disturbing or frightening the animals
  - Report any large pollution or spills or discharges from ships with as much detail as you can
- Personal Conduct and the Conduct of others:
  - Avoid causing distress to the animals – observe, enjoy but do not touch or harass
  - Do not drive Jet Skis or other noisy watercraft around them or close to them, it will cause anxiety and stress (another cause of unnatural deaths)
  - Remember these are wild animals and not domesticated pets, despite their timid and shy nature. Do not try to touch them or interact directly
  - Do not contribute to marine pollution or marine debris – take all your rubbish home for disposal, our seas and oceans are not a bin
  - Take part in "clean ups" that are organised on a national or local basis or better still, organise your own
  - Support your country's conservation and management efforts for the marine and terrestrial environments

THE DUGONG'S FUTURE

Every day, species of flora and fauna disappear from our planet forever and many are on the verge of extinction having been listed as critically endangered. For some it is a natural evolution as they fail to adapt to the ever changing environment of our planet, but nature is if anything resilient and new species are being discovered in the most inhospitable of habitats. In most cases, it is man's impact on the environment whether planned or unforeseen that is contributing to the disappearance of these species as we alter habitats, "play" with nature upsetting the "balance" and corrupt and pollute and poison. Let us collectively protect and preserve the UAE's natural heritage and make sure that the Dugongs are around for future generations to enjoy. Play your part and make everyone who lives, works or plays in the marine environment, accountable to the impact on marine creatures and particularly our Dugongs.

"Always Keeping the Fun in Diving"

Photo by Doug Perrine

TEACHING DIVING BEYOND DISABILITY

FEATURE AND PHOTOGRAPHY **FRANCIS UY**

"Your present circumstances don't determine where you can go; they merely determine where you can start." ~ Nido Qubein

When my colleague, Gam asked me if I could teach her physically challenged friend how to dive, I never felt more alive. You can say that it's an opportunity close to my heart. Aside from the fact that I am a certified Handicap Diving Instructor, I was a Physiotherapist before I changed careers to professional diving. What makes this experience so unique is the determination of one person to go beyond their limits in order to succeed. His determination to rise above his challenges humbled me. This person comes from a poor family in Chonbori, Thailand. He was hit by a car when he was 13 and his life turned upside down! He underwent rehabilitation for two years. His parents were poor and couldn't afford to send him to school. But instead of wallowing over his fate, he enrolled in a special needs institution. There, he applied for a scholarship for both swimming and basketball handicap teams. It was the basketball team that opened all doors for him. He's now one of the best players representing the Thailand National Basketball Team. His accolades led him to be invited by the Dubai Government Handicap Basketball Friendship game to play for the Dubai Municipality Team. The game was organized and sponsored by the Nad Al Sheba Ramadan Tournament under the patronage of His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of the Dubai Sports Council. His name is Aekkasit "Ton" Jumjarean.

Thailand is one of the popular diving destinations for tourists from around the world. Ton had always been curious of what his motherland has to offer and why tourists kept coming back to dive in the many dive sites all over Thailand. He had always yearned to see what marine life had to offer, but he couldn't afford to pay for his diving license, and when I heard about his story, I immediately contacted Norzilla Ishak, the Assistant Curator of the Dubai Aquarium and Underwater Zoo. Without second thought, she took care of all the necessary documents for approval from the Dubai Aquarium and Underwater Zoo senior management to pay for all the necessary costs and to let him do his final dive at the aquarium for free. I also had to enlist the help of Ahmed Dalmok, the owner of Extreme Dubai, who kindly let us use his facility for the classroom and the pool for the duration of his training. Communication was a huge obstacle but with the help of Gam Kaewkam as our translator, it made the theory session much easier. Having support from the Dubai Aquarium and Underwater Zoo and Extreme Dubai, we were able to help one person make his dream come true. I have great respect for people who are physically challenged yet rise above their disabilities. It's such an honour that I was given the chance to certify Ton and I feel proud for what he has accomplished. I am a firm believer that if he can achieve whatever he sets his mind to, you can too!

After his certification, he invited me to watch the basketball game. Watching him play in court made me realize that there is really no limit as to where your dreams may lead you. It only takes sheer determination, will power and a little help from a friend. His life is an inspiration!

ONE OCEAN DIVING

FEATURE AND PHOTOGRAPHY **JAKE LYLE**

Once a person formulates a perception of something in their mind, it becomes very difficult to change it – making perceptions very dangerous. There can be a thousand influences that lead a person to a certain perception, some can be heavy influences and others have little effect. One of the most heavy and harmful influences on the perception of sharks is the 1971 classic, 'Jaws'. The movie and similar motion pictures that followed it, lead to an unnecessary and unwarranted fear of this magnificent species. But there are some people around the world trying to rewrite that perception and turn it into something good, one group of people with such an aim is the founders of One Ocean Diving in Hawaii, on the island of Oahu.

This group organizes short expeditions that take you out to sea to swim with these peaceful creatures, helping the world to understand the harmony that can exist between sharks and people. The idea is simple, but the effect is limitless. With the proper awareness on the subject, the easier it becomes to bring an end to the constant slaughter of 200 million sharks per year.

The waters of the North Shore of Oahu are filled with a number of different shark species, from the larger ones such as Tigers and Galapagos to smaller species like the Sandbar, making it a perfect place to freedive with them. All of these species frequent close to the coast, only a few miles offshore, making for a short boat ride out there, weather permitting.

The boat left the dock at 7:00am (the best time of the day to see the larger species) and although the sun was out and the sky was clear, the wind was strong and the waves high. Wind and waves weren't going to hold us back though, so we braved the seas and headed out to the shark hotspots.

About 3 miles offshore, the boat slowed and our eyes scanned the water in search for any signs of something lurking below. It wasn't long before a few black fins begun to slice through the surface of the water, telling us exactly where to get in.

Swimming with sharks isn't an endeavor that you can undertake without a little preparation, and so we went through a few warnings and guidelines. These guidelines make swimming with sharks a safe and virtually risk-free activity, as they provide you with a concise and valuable education on how to interact with these wild animals safely, and as long as the guidelines are followed – the dangers are minimized.

Much of the interactions between humans and sharks are a competition of dominance, and as long as you don't lose your dominance, you're not at risk. Most species of sharks are either equal to or smaller in size than humans, therefore they see humans as just another predator that rival themselves as opposed to something they'd enjoy for lunch. Because sharks see humans as predators and not prey, their instinct is not to attack us, but to shy away from us. As they see us in that way, the last thing that they would want to do is take a bite out of us, because that would only invoke retaliation from us, the 'rival predators', therefore they steer clear. With this information, the risks of swimming with sharks are minimal.

The dark grey fins around the boat continued circling as we geared up and readied our cameras. As the ladder was dropped off the back of the boat, we waited till the sharks cleared a path for us to enter the water and suddenly the opportunity presented itself. Hoping not to spook the sharks, the entrance to the water was slow, and as soon as I was underwater, there were 10ft Galapagos sharks in every direction. Intimidated at first, the sharks kept their distance and remained weary. As the sharks became more comfortable with our presence, the distance between us became smaller and smaller. Eventually, their curiosity got the better of them and the bravest of the sharks would swim toward us, investigating us, coming within a few inches of us and sharply turning at the last second. Despite these intense interactions however, I never felt threatened or at risk. The experience was surreal and the harmony between humans and sharks was evident. Swimming alongside these 10ft predators, who have successfully used millions of years to evolve into an apex masterpiece, it was clear that although they had evolved to be the most successful killers in the ocean, they had no intention of using their evolutionary tools and instincts to kill at this moment, but rather, they were in a peaceful state, calm and relaxed, simply enjoying our unusual presence in their domain.

With that, all beliefs about sharks being man-eating monsters were expelled from my mind and I too, was at peace with these magnificent creatures.

It is experiences like these, and stories like these that are the effective weapons against the negative perceptions and the shark culling as a result. Through accidental events of mistaken identity, sharks kill on average, 12 people per year. Through purposeful and intentional actions, we kill 200 million sharks per year. The ratio is not even, and killings are not sustainable. The best and most effective way to battle this tragedy is to change people's minds. Show them the peace and serenity that exists below the surface and within these creatures, and that will hopefully one day exist between sharks and humans. If we change the perceptions, we change the game.

NIMAR UNDERWATER SYSTEM WITH THE CANON 70D DSLR

FEATURE AND PHOTOGRAPHY **SIMONE CAPRODOSSI**

I have tried several housing brands and have never received something so nice and complete.

I was recently given the opportunity to try out a Nimar Underwater System for the first time with my Canon 70D DSLR for some macro shooting. I had never taken the 70D underwater as I use it only for birding and safaris to leverage the cropped sensor and boost my telephoto power.

I normally shoot underwater with a Canon 5D Mark III in a Subal underwater system so I was curious to see how well I could work with an entry level system and compare it to my current experience.

I felt like a fresh new start when I moved to Dubai 8 years ago from Europe and with more chances to dive frequently, I decided to bring my photography underwater. As a first step, I went for the entry-level available solution that was a polycarbonate transparent Ikelite system for my Canon 40D camera at the time.

That gave me a good starting point but also gave me a few issues with leakages as the tightening system, particularly for the ports, was quite loose and the material felt fragile. So, once I upgraded to a more professional camera system and intensified my diving and photography, I also upgraded to a more top end housing system.

When I received my Nimar system I was very impressed with the attention to detail and the customer care. I have always complained about the fact that really expensive housing companies don't bother including port covers, o-ring removers or any other accessory needed to make the photographer's life easier despite the hefty bill.

The Nimar housing comes in its own padded soft bag and is accessorized with anything you may need: spare o rings, cleaning cloths, o-ring removers and different keys and mini screw drivers. Everything is included, so you are ready to go.

The housing was such a positive surprise to me with its sturdiness and reliability. It is made of a thick transparent polycarbonate that feels very robust despite the material being in general, more delicate than metal housings. The step change from my first housing memories, is the Nimar locking system: 4 large metal fasteners clip the back tightly into place and a bayonet locking system for the port provides very safe waterproofing down to 60 metres. A leak alarm completes the security, leaving leakage risks up to the photographer's human error. The housing is also finely shaped around the camera, which makes it about as compact as metal housings, which is very important, especially when carrying it on a plane.

With such good design, the polycarbonate material loses all the disadvantages and keeps the benefit of seeing through to your camera which I always liked about my first system.

The other new experience for me, was to try a fiber optic strobe connection. I normally use my Inon Z240 strobes with a sync cord as the 5D Mark III has no built in flash to trigger fiber optics. The 70D with the Nimar housing is perfectly designed for fiber optic connection. You just have to slide in the camera with the flash unlocked and fit the thin fiber optic cords in the designated holes in the front of the housing. The fiber optic cords then get connected to the optic triggers of the strobes all with easy wet connections. This system requires half the setting up time and takes away the need for all the extra dry connections that could go wrong with sync cords. For Sync cord lovers, or if you have strobes that cannot be run via fiber optics, there is still an available cord connection head on top of the housing that links to the camera via an internal hot-shoe, allowing to connect an external TTL or one flash directly.

I was eager to get this new toy wet, so I first tried it in the pool to familiarize myself with handling the housing and the fiber optic lighting system. The housing was really easy to use and all the controls very responsive. Some of my pool "wildlife" shots were quite successful right away. I tried to shoot in TTL with the fiber optic and found the images were slightly underexposed vs. my manual setting and would need some brightening in post-production.

The housing allows to access nearly all functionalities with a couple of small exceptions as it is not possible to operate the back wheel control of the camera, nor access the "AF" and "drive" direct setting buttons on the top right.


TTL Strobe Settings


Manual Strobe Settings

This was a design choice not to clutter the back as the Canon 70D has a very useful "Q" button in the back that allows to select any setting from the menu via the arrow controls and then change them via the top wheel. As I started using the menu and the Q button, I found myself loving the simplicity of managing settings this way and the transparency makes it really easy to look through to the camera display. It is not possible to operate the ON/OFF camera switch however, so you must remember to switch your camera ON when putting it in. In any case, with the basic practice of taking a test photo after assembling the system at home, it will be evident if one forgets to switch it on.

The UAE's East Coast offers a few nice diving spots to practice macro photography, so I booked a day trip with Divers Down to dive Inchcape 1 and 2 (2 small wrecks sunk about 15 years ago that have developed into quite rich underwater environments) in Fujairah to finally test the housing out in the field.

Inchcape1 is a deep dive at 30m with limited bottom time to about 25mins. My mask kept fogging so I got to try the housing out in difficult test conditions. The housing proved really easy to handle and friendly to operate despite my lack of experience with it. I used manual strobe settings as those are easy to set for macro and managed to get some nice shots of a lovely seahorse and some cute catfish that were hiding between parts of the wreck. The housing has slight positive buoyancy which was a very welcome relief while holding the housing in one hand and cleaning my mask with the other, repeatedly.

The second dive at Inchcape 2 was more relaxed as I sorted out my mask issues and we were only at 20m, so I could enjoy a relaxed dive and test the housing functionalities. I played around with settings with some of the many scorpion fish and small catfish moving around in a compact group, confirming the smooth operation of the housing.

I enjoyed the cropped sensor of the 70D giving extra magnification to my Canon 100mm macro lens. A cropped sensor is ultimately a better choice than a full frame for macro shooting. I usually have a Macromate wet diopter on my macro system to get extra magnification. I could not use it with the Nimar housing as it is a fit for my Subal port, but I look forward to trying the cropped sensor with a wet diopter for some serious supermacro.

The only struggle I had, was not having a focus light with me as I did not have the right attachment to connect mine on the Nimar housing, so I had a friend with video lights stand by me, particularly at depth and in greenish Fujairah waters. The Nimar macro port is actually designed to attach a focus light on a slot on top of it, so this normally would not be a problem. I look forward to getting that connector and completing the system.

Net, I think the Nimar system offers a great product and value housing option as I could deliver the same image quality I would have gotten with my 3 times more expensive pro-system. I would definitely recommend it to someone taking the first steps into DSLR underwater photography, and I would seriously consider it as a solution to a more experienced photographer. I am now eager to try the Nimar housing on my 5D Mark III for wide angle.

TECHNICAL DETAILS:

- Housing material: Black and transparent Bayer Makrolon (High Quality Polymer)
- Max working depth: 60 m
- Overall dimensions with handles, eyepiece and eyepiece guard: L. 34cm H.17cm. D. 26cm
- Weight with handles: 2.70kg
- Set-up in water: lightly positive
- 4 Aisi 316 S/S fasteners with clip catch
- Removable port in black ABS with bayonet coupling, flat lens, s/s gear for adj. the zoom on the Canon EF-S18/55 mm 3.5-5.6 IS II lens
- Removable eyepiece view finder, magnification 1.5x
- Control material and inserts: chromed brass
- Flash connection in chromed brass: TTL 5 pin
- Humidity acoustic alarm sensor included

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FIRST UNDERWATER TEST FOR THE NIKON D5500 WITH NIMAR HOUSING AND LIGHTS

FEATURE AND PHOTOGRAPHY **NICO DE CORATO – VISIONARY OWNER OF DUBAIBLOG**

A Video sample: https://youtu.be/liqF4VF9S74

During the Nikon Imaging Middle East and Africa Gateway last week, NiMar gave me the opportunity to test out the new reflex D5500. I chose several places with different conditions to test the camera out: Banco di Santa Croce, in Italy; Khorfakkan (both a wreck and a reef dive) and Musandam.

This camera is very different from the D3200. The Nikon D5500 belongs to the mid-range segment of the reflex market and I was expecting better image quality from this one. In addition, I had an extra years worth of experience in underwater photography at my disposal. Nevertheless, I did not expect to have my photos published on the Nikon Middle East Facebook page.

Let's review in detail what impressed me the most in this camera in comparison to the D3200. The sensor is a CMOS APS-C manufactured by Sony with 24MP and without a low-pass filter; it's slightly bigger than the one in the D3200. The larger the sensor, the more light it is able to capture, increasing the quality of the image.

Sensitivity to light is much higher, from 12,800 ISO to 25,600 ISO; the higher level of ISO allows to capture more light, avoiding shade and allows to take good pictures in situations where there is less light. However, higher ISO settings will result in images of lower quality.

The battery lasts longer than the D3200 and the older model of the same series (D5300) because of the absence of the GPS; in fact it's possible to shoot 220 more pictures than the 5300. This is important as, when you are out diving, you want to limit the number of times you open the housing to ensure the safety of the equipment (normally, I place the camera in its housing before getting to the dive site and open it only in dry conditions).

While underwater, the touch screen and the viewer are unused, but they are both useful once on the surface.

The camera body is slightly smaller; this might be a problem when mounting bigger lenses, but in the water it makes no difference.

There is some room for improvement in the picture review mode. The predefined mode includes a large, dark band at the bottom of the screen that, inevitably, covers the lower part of the picture and makes reviewing laborious. To select other reviewing modes, you need to first access the "main menu/review/options" and activate the "only image" or "panoramic" mode. Less experienced photographers might not be able to find this setting.

I couldn't say that the Nikon D5500 is very different than the 5300 (this is part of the model's evolution) because all the main characteristics (sensor, AF and viewfinder) are rather identical. The only obvious difference is the price which at the launch is quite high; however the quality of the pictures I took with this camera definitely satisfied me.

Let's now review the housing: the NiMar housing for DSLR Nikon D5500 is transparent polycarbonate and fits the camera perfectly. The new stainless fasteners with clip safety assure efficient waterproofing down to a depth of 60 meters. The buoyancy is slightly positive to avoid the risk of it sinking if you lose the camera.

The camera also features ergonomic side handles, practical mechanical controls, an optical viewfinder with 1.5x magnification and additional accessories complete the offer.

TECHNICAL DETAILS
NIKON D5500:

- Extraordinary image quality: Nikon DX format; focal length equivalent to approx. 1.5x that of lenses with FX-format angle of view without OLPF
- Superior performance in low light conditions: ISO 100-25.600
- Vari-angle monitor: 8.1-cm/3.2-in. (3:2) with ample viewing angle
- Sensitive touch screen: one-touch focus & shooting or one-touch regulations for settings like diaphragm, ISO and exposure
- Fn touch function: quick regulation with one finger of key settings during shooting with the viewfinder
- Built-in Wi-Fi: easy sharing of extraordinary photos through compatible smartphones or tablets
- Slim design: lightweight body. Camera measures 124×97×70mm and weighs only 420gr (with no battery and memory card)
- AF system with 39 points: including 9 cross-type sensors
- Contrast-detect AF anywhere in frame: 20% faster than D5300 in Live View
- Image processing processor: EXPEED 4 fast and powerful
- Top Continuous Shooting Speed at full resolution 5 frames per second
- Full HD Movies: Support for production at 1080/50p/60p and Full HD at 60p
- Picture Control 2.0: precious instruments to take pictures and videos as you wish them. Includes the new uniform setting "Flat"
- Built-in stereo microphone and compatibility with Nikon ME-1 stereo microphone
- Viewfinder: 95% frame coverage and 0,82% magnification
- 10 special effects for pictures and movies
- 16 scene modes






- Creative tools: Retouch images, bracketing functions, HDR photography, fixed interval shooting and more
- Expandable system: compatible with the full range of DX Nikkor lenses and specific Nikon flashes
- Compatible with WR-R10/WR-T10 remote controls

TECHNICAL DETAILS
NIMAR UNDERWATER HOUSING:

- Housing material: transparent Bayer Makrolon (High Quality Polymer)
- Depth rating: 197' (60m)
- Overall dimensions with handles, eyepiece and eyepiece guard: L. 34 cm H.17 cm. D. 26 cm
- Weight with handles: 2.70 kg
- Set-up in water: lightly positive
- 4 Aisi 316 S/S fasteners with clip catch
- Removable lens port in black Delrin with bayonet coupling, flat lens, s/s gear for adj. the zoom on the lens AF-S Nikkor 18/55 mm f/3.5-5.6G ED VR.
- Removable optical viewfinder, magnification 1.5x

THE DIVES

For more information about dives at the Banco di Santa Croce, you can contact A.S.D. Bikini Diving, a team of International Instructors of Scuba diving, and scuba professionals
Via Bonito 14 c/o Hotel Montil, 80053 Castellammare di Stabia
Tel: +39 338 944 9567
Email: info@bikinidiving.com
Website: www.bikinidiving.com

7Seas Divers has been established since 1994 and is located in the heart of Khorfakkan City, the East Coast of the United Arab Emirates.
Tel: +971 09 238 7400
Email: bestdive@emirates.net.ae
Website: www.7seasdivers.com

We had the chance to dive in the Musandam with Nomad Ocean Adventures, a family run diving centre dedicated to the environment and its preservation; a fully equipped PADI resort dive center and a TDI (Technical Diving International) dive center.
Tel: +968-2-6836069
Email: info@discovernomad.com
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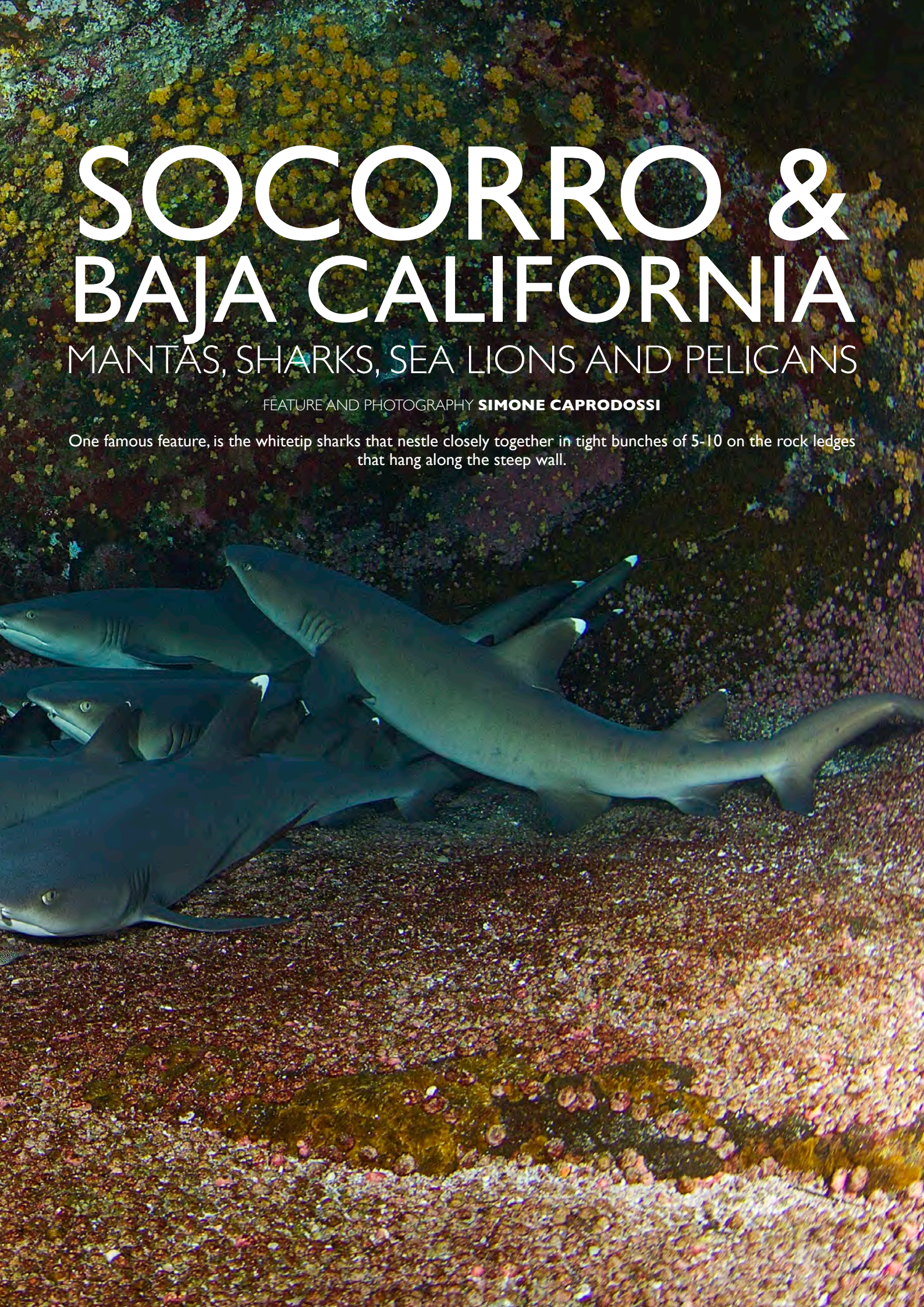
SOCORRO & BAJA CALIFORNIA

MANTAS, SHARKS, SEA LIONS AND PELICANS

FEATURE AND PHOTOGRAPHY **SIMONE CAPRODOSSI**

One famous feature, is the whitetip sharks that nestle closely together in tight bunches of 5-10 on the rock ledges that hang along the steep wall.



Last February we went on an amazing trip, with Dubai based marine biologists David Robinson and Rima Jabado, to discover the marine life of one of the most biodiverse regions on earth: Socorro and Baja California.

The planning of this trip actually began the year before in Mexico as we were diving the Cenotes and snorkeling with sailfish on the Caribbean side with our friend Barna Takats, the leader and founder of Encounters, a small travel company specialized in diving and nature adventures in Mexico and beyond.

Barna mentioned that he was trying to put together a group of keen divers to explore Socorro the following year. We had not even made it back to the UAE and we were already booking another trip to Mexican waters. Very few boats go to Socorro so it is necessary to book in advance. As we had a whole year to plan, Barna managed to build a full discovery program to explore Baja California adding some mini trips before and after the Socorro Liveaboard.

The base destination would be Cabo San Lucas on the extreme southern tip of the Baja California Peninsula. Cabo is easily reached via the US as it is a beach holiday hotspot for Americans and direct connections are available from most big US cities. We found a really smooth connection via Atlanta with Delta that would get us there in "only" 22 hours.

If you want to experience Mexico, Cabo is not exactly the genuine local experience as everything is mostly created for American tourists. We did find however, a little haven of true Mexico in The Bungalows, a lovely B&B in the upper part of town a little farther from the all night entertainment managed by local brother and sister, Eric and Ali. Very nice rooms around a pool courtyard with lush vegetation, very local decorations and a truly warm welcome and absolutely delicious breakfast to start the day.

So after a quick day of Cabo exploration with a boat trip to see the famous Arch that marks the southernmost tip of Baja, we were ready to leave this American outpost and go to La Paz, a small city on the Gulf of Cortez.

LA PAZ – WHALESHARKS AND SEA LIONS

La Paz is just a three hour drive away crossing a rugged dry mountain landscape dotted with cacti.

The first day's plan was to go look for whale sharks with local scientist Darren Whitehead who kindly offered to take us out on his daily research trip to record whale shark encounters and take spot pattern pictures to identify them. It was a quick success as only half an hour after boarding, barely out of the port, we found the first whale shark swimming in shallow waters along some sandy islands. We had a few more encounters that morning and had good chances to swim with the sharks and take a few photos. We

also got to see our first Humpback whales of the trip who treated us to a few breaches and closed the day accompanied by dolphins back to port.

The next day from La Paz, was one I had really been looking forward to as we'd go out to swim with sea lions. Isla Espiritu Santo, an hour boat ride along the spectacular coastline of the bay of La Paz, hosts one of the biggest and friendliest sea lion colonies, and is considered one of the best spots to dive with them. Barna organized a private boat for us so that we could get maximum time in the water and a more private encounter. We left early to be the first boat to arrive and on our first dive, we had the sea lions all to ourselves. Being in the water with these highly intelligent and playful mammals, is an incredible experience. They seem to be as entertained interacting with you as you are with them and don't get bored of flipping around the divers, playing in the bubbles and looking at their reflections through the camera dome. Like young puppies, they also love to bite and pull, so you definitely walk way with a few teeth marks on your fins and wetsuit. Watching how they play and interact with each other is also amazing and my highlight was when two sea lions picked up a red sea star and started throwing and fetching it between themselves right in front of us, showing off their skills.

I also managed to get my best selfie to date, with a sea lion looking curiously into the dome port from behind my shoulder.

By the second dive, a big ball of small bait had formed in the shallow area and we also got to see cormorants diving and fishing into the fish ball and the sea lions swimming through, creating little highways in the compact mass of fish. After our very successful La Paz mini trip, it was time to get back to Cabo to finally board our long awaited cruise to Socorro the next morning.

SOCORRO – MANTA, SHARK & WHALES GALORE

We finally woke to the day we had been waiting more than a year for! It was time to embark our Socorro liveaboard on the Sea Escape.

What is commonly called Socorro, is actually the Revillagigedo Archipelago, a very remote bunch of semi uninhabited islands, nearly 400km off the Mexican Coast into the Pacific Ocean. The archipelago is a Marine National Park and due to its isolation, its waters have remained pristine and extremely rich in fish life. Given the large distance to cover and the lack of protection out at the islands, all the liveaboards are hard looking boats with big metal hulls. Typically, they used to be service boats for Oil Rig operations. The Sea Escape is one of them and it's not a typical luxury liveaboard, but rather a basic one. There are a couple of fancier boats but those are bigger and carry more divers, so we opted for the smaller group of 16 divers in total at the expense of a fancier stay.

We boarded the boat around midday, began getting to know our new friends from Barna's group and got a long briefing on all the boat practices and schedules. The trip can take between 20-35 hours to get to the islands, depending on the sea conditions. We were blessed by beautiful weather and a really calm sea so we got to relax on the top deck, spend time carefully putting together all the camera gear and enjoy a gorgeous sunset. After dinner and a good night's sleep, after "just" 21 hours of navigation. we woke up to the Island of San Benedicto in the distance. San Benedicto is the closest island to the mainland and it is a volcano crater emerging from the deep sea. The landscape is really unique as the entire island, down to the water, is actually covered in solidified lava and closer to the water where the surface has been eroded by different layers of lava from multiple eruptions.

As soon as we arrived we were welcomed by humpback whales breaching in the bay as they come to the islands during these months to give birth.

It was finally time for our first dive: "The Canyon". It was meant to be just a practice dive on the first day and the boat leader tried to have us go down without cameras, but we basically went into semi mutiny and refused to lose photo opportunities. And thankfully we did. The dive was everything we hoped Socorro would be. We barely reached the bottom and were welcomed by two oceanic mantas who kept circling above us. They in fact kept following us throughout the dive, even as we moved on looking for sharks. Whitetips were swimming around by the rocks and as soon as we reached the edge towards the blue in a stronger current area, we could spot some silvertips, a large Galapagos shark and a school of scalloped hammerheads in the distance. We finished with silky sharks swimming around us at the safety stop and up to the surface. Rima, who normally gets to identify dead sharks in her fish market surveys, could not be more excited to have seen 5 shark species all alive in just one dive!

To add to the thrill of the first dive, we were told that given the good sea conditions, we would travel to Roca Partida that night. That was meant to be THE hottest dive of the trip.

Roca Partida – meaning Split Rock in English – is hardly an island and from the surface, rather appears as a small, jagged rock formation on the horizon. Underwater, it's one of the most unique diving areas in the world, an underwater cathedral, with only the tip of its spire breaching the surface of the sea.

Roca is a volcanic seamount, with very steep vertical walls that disappear into the blue depths, sitting alone in its underwater majesty, miles from any other island landfall.

As it is very small and takes more than 8 hours of further navigation to reach, the cruises need to wait for a window of good weather and as soon as that comes, try to get a day or two at Roca. We seemed in luck with the very flat sea and we smoothly got there overnight. Unfortunately, as we got up, the sea started to rapidly worsen and within an hour, the boat was shaking in the waves. We had to soon

leave Roca, as it is completely unprotected and if the sea got any worse, it would become dangerous. The Capitan decided to still give us at least a dive and despite the rough conditions, we quickly geared up to get at least one glimpse of this marine paradise. As we got underwater from the rough surface, we suddenly found ourselves in an incredibly vast and silent landscape. The water is extremely clear with visibility beyond 30-40 meters and the walls are immense, much bigger than you expect from the surface, and incredibly steep.

One famous feature, is the whitetip sharks that nestle closely together in tight bunches of 5-10 on the rock ledges that hang along the steep wall. The swell is very strong close to the wall so it is hard to get images while hanging to the ledge a few meters away from the sharks.

On a perfect day at Roca you can see walls of hundreds of silky sharks. We only got a few passing in the blue but then had a nice visit of the local pod of common dolphins that entertained us until it was time to close the short dive. As we emerged, we could see how much worse the sea had gotten and we struggled to get off the ribs leaving the crew with the really tough job of lifting them up to get ready to sail away as fast as possible. The boat actually lost its anchor pulled by the strong waves and we had to ride for more than 8 very shaky hours to reach the more protected Socorro Island. Socorro is the biggest island of the Revillagigedo, inhabited by about 45 people and offers protected bays on both sides, allowing to hide away from the stormy sea.

We spent two days diving Socorro and sitting out the rough sea conditions. We did three dives a day respectively in Punta Tosca and Cabo Pierce on two edges of the island. Apart from the highlight of dolphins following our rib, and coming to play with us as soon as we got in each morning, the Socorro Island diving was less impressive than the first days. The visibility was poorer, topography less interesting and currents were tougher. We still saw a manta and some hammerheads at every dive so it is quite spoilt to consider it "poorer" diving, yet the standard is so high, that these were the lows of the trip.

One of the beauties of the small bays in Socorro is that the humpback whales were sheltering there so looking out, you always saw a spray or a whale pass and some came really close to the boat. Barna, who was constantly on the lookout, managed to swim with one by just jumping in from the back of the boat when a mother and her calf passed just a few meters away. On one afternoon, we decided to skip a dive and try to get in with the whales. The other group had a faster boat and managed to get some great underwater passes. We were slower so typically got in too late and just once caught a glimpse of a calf submerging. We still got to spend an hour chasing humpback whales though, which is a pretty amazing experience in itself.

On the sixth day, we left Socorro and got back to San Benedicto where we finally got to dive my absolute favorite dive of this trip and surely one of the top 5 of my diving life: "The Boiler".

The Boiler is a submerged pinnacle with the top about 5 meters below the surface, and the walls steep down into the depth. It is renowned for amazing manta interactions. We were told stories of several mantas flying in as soon as divers go down looking for the spa effect of air bubbles, and the more bubbles you make, the more mantas you get.

The dive experience is beyond any story told. First the water is crystal clear with visibility of 30 meters and beyond, and the pinnacle can be seen in all its glory rising from the depth. Descending by the wall, whitetip sharks, turtles and huge morays animate the rock ledges. Both mornings before the mantas could arrive, we were welcomed by the most playful dolphins. I actually had to stop taking photos on one dive as a dolphin came to play with me

and I wanted to truly enjoy the eye contact and engagement of this incredible interaction.

And then of course came the mantas. We had 4-5 huge oceanic mantas around us at every point in time and exactly as we were told, they could not get enough of our bubbles. I was taking photos of manta action with a fellow diver and I felt a presence behind me several times. It was a manta claiming my bubbles. If you blow big bubbles, you'll get a manta literally 50cm from your face. This allowed for another memorable underwater selfie. Besides the unique behavior, the other special part of Socorro is the abundance of black mantas that are quite rarely seen elsewhere. On one of the Boiler dives, a huge black manta actually stayed with us for the entire dive and remained with us through the safety stop still hanging around the rib until we had to leave.

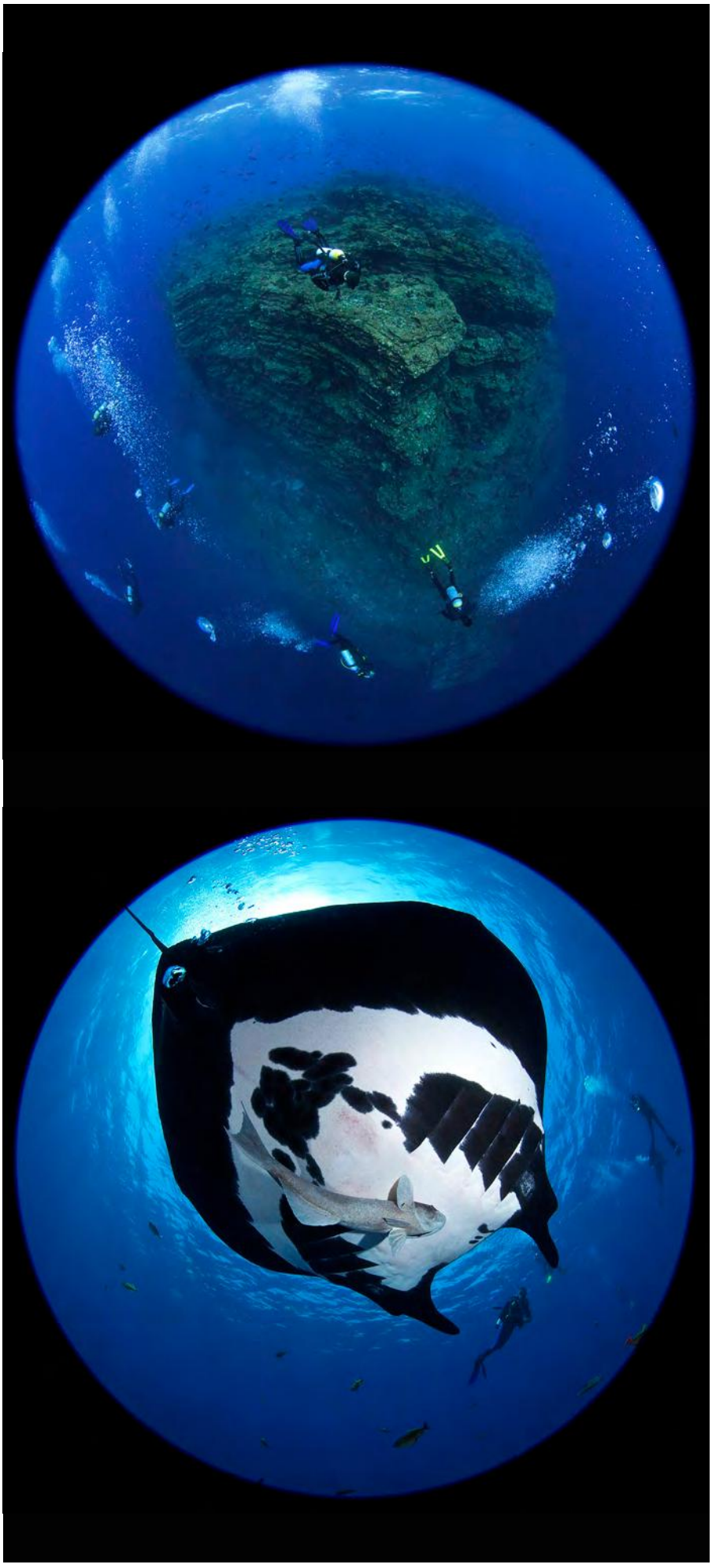
Our guide Alister, always took us out in the blue for the last 5-10 minutes of the dive especially hoping for a whale to come by. We could always hear them communicating underwater and after the second Boiler dive, the whale sound was so strong, we really expected to see one any second. Then the sound stopped and we saw something big coming towards us, but to our surprise it was actually a big beautiful tiger shark. It checked us out and circled back around a couple of times. The encounter was amazing though everyone seemed extra fast to get back on the rib as soon as the 3 minute safety stop was over.

On the last evening in San Benedicto, we decided to jump in with the silky sharks that hang around the back of the boat typically waiting for kitchen scraps. We jumped in at dusk and got some nice pictures. Then as soon as it got darker, we actually rushed back to the boat as they became less shy and as we had gotten in without wetsuits, we wanted to avoid any nibbles on our bare legs.

It was finally time to go back to the mainland and we were lucky to again get a very smooth ride, along with stunning weather. We regretted having had only the one chance at the Roca Partida dive, but it turned out that in our week, none of the other boats even managed to get there, so we were still very lucky to have had at least one experience.

WHALES AND PELICANS IN BAHIA MAGDALENA

Back to the mainland with some amazing memories, we were excited to know that we still had another mini-trip ahead of us. This time Barna organized a more off the beaten track trip for us to Bahia Magdalena, about 200km north of Cabo on the Pacific Ocean side. Bahia Magdalena is locally known for whale watching as grey whales spend a few months in the winter there and we were in full season. The main reason for us to go, was to actually try to photograph blue and mako sharks. Barna had the direct contact of a local ex-fisherman,



Gavino, who recently stopped fishing for sharks and started taking people out to see them instead. We left at first light for our shark day. We saw a few grey whales heading out in the bay, but we continued straight through as we'd do more proper whale watching the next day. As soon as we stopped to chum a few miles out in the blue, a loggerhead turtle came to visit us. The only sharks that came to us were some small hammerheads. They are very shy and would never stick around if we got into the water so I just managed to grab an ID shot dropping the camera in the water. We were very excited when Rima identified a smooth hammerhead shark (*Sphyrna zygaena*), that none of us had ever seen before, taking our total shark species count of the trip to 7. The blues and makos did not show up but we knew there was a good chance of that as it was early season. We started to head back and Gavino offered to bring us to see the areas where local fisheries land the sharks. The best show was the tens of pelicans fighting to get some of the scraps from the fishing boats. So we asked Gavino to bring us closer to get some pelican shots and he simply threw a few of the chumming sardines in the water. In no time, we had our own tens of pelicans by the side of the boat. This suddenly opened an amazing underwater photo opportunity and we got our housings in the water to catch the pelican feeding action. We only stopped shooting when we ran out of sardines. I had not seen any good underwater pelican pictures and we had a serious opportunity here, so we asked to plan for more sardines and cutting the whale watching for more pelican shooting the next day.

As a thick layer of early morning fog slowly rose while we sailed into the bay, a stunning landscape opened up. The water of the bay, flat as a lake, reflected the blue sky with scattered clouds and the edge of the bay stood at the horizon like mountains emerging from water. The water surface just broken by the grey whales surfacing for air and dolphin pods jumping. After a couple of hours with the whales, we headed back to our pelican photography ground and got to shoot a few more hundred images in the good morning light. Gavino and Barna were now trained in throwing sardines in exactly the right spot for good shots. The morning was quickly over and we had to finally leave for our last night in Cabo before heading back to Dubai the next day.

A special thanks goes to Barna that organized an amazing trip for us. Not surprisingly, we got back with another trip already booked with him for next February in the Galapagos…

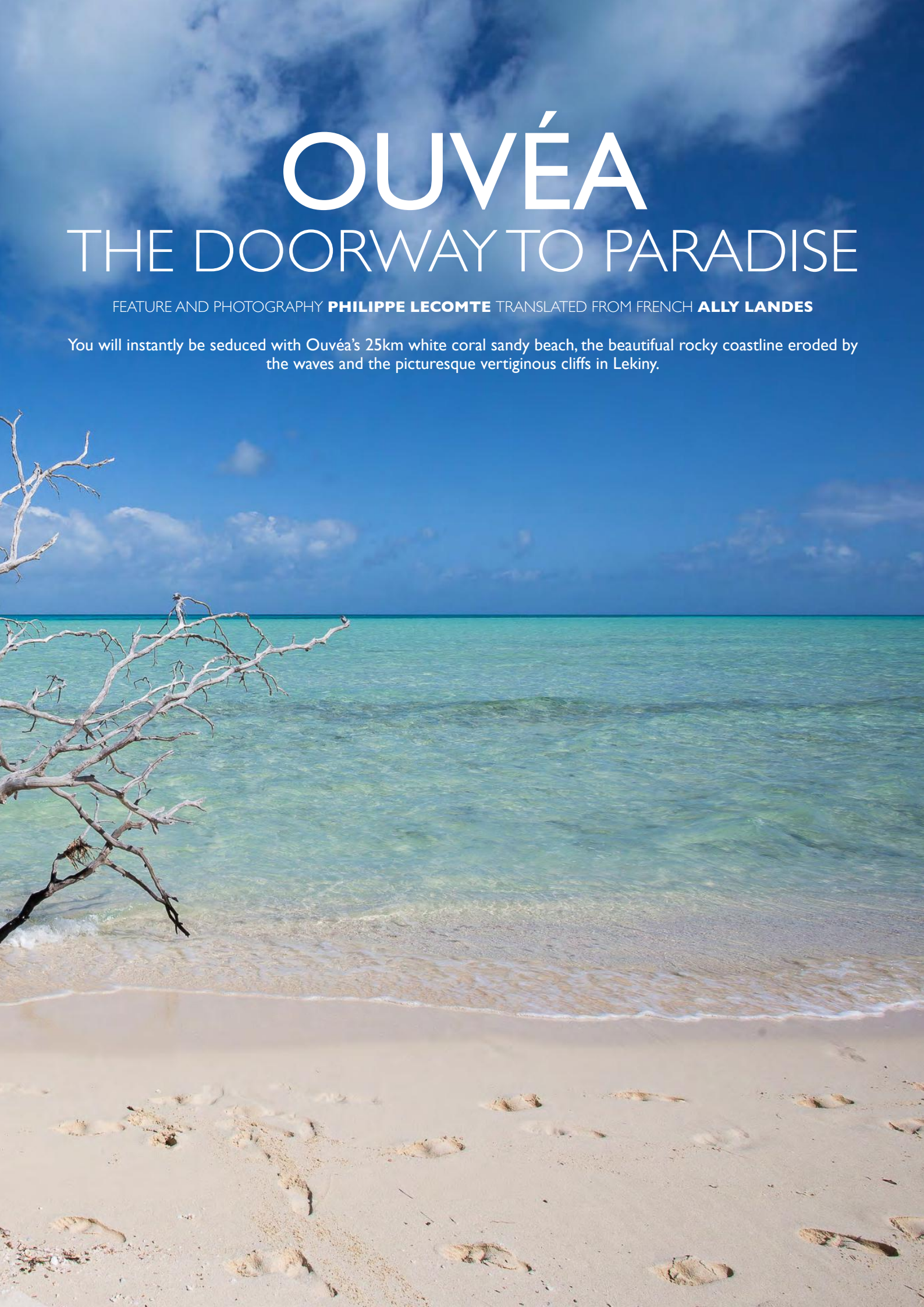
ENCOUNTERS – NATURE TOURS
Founder and Guide: Barna Takats
Socorro Bookings: 9-16 March 2017
Email: info@encounters.com.mx
Website: www.encounters.com.mx

THE BUNGALOWS – CABO B&B
Email: cabobungalows@gmail.com

OUVÉA
THE DOORWAY TO PARADISE

FEATURE AND PHOTOGRAPHY **PHILIPPE LECOMTE** TRANSLATED FROM FRENCH **ALLY LANDES**

You will instantly be seduced with Ouvéa's 25km white coral sandy beach, the beautifual rocky coastline eroded by the waves and the picturesque vertiginous cliffs in Lekiny.



The word "Island", is a magical word. It makes us dream of a heavenly place with sun lit, vast sandy white beaches, surrounded by turquoise, crystal blue seas. This perfectly represents the magic of Ouvéa.

Ouvéa is a commune in the Loyalty Islands Province of New Caledonia, an overseas territory of France in the Pacific Ocean. With a flight to Sydney via New Caledonia, you will then need to take another 40 minute flight to reach the island.

There are 4 Loyalty Islands: Maré, Lifou, Tiga and Ouvéa. Ouvéa possesses the biggest lagoon and was declared a UNESCO World Heritage site in July 2008. Absent from any pollution and mass tourism, you can discover a truly unique environment on this paradise island. Ouvéa's income comes from fishing and from the culture of coconut palms (the island possesses an oil and soap factory). With only 3,400 habitants, the locals are incredibly welcoming, inviting you to partake in their daily activities such as fishing, hunting in the local fauna or showing you how to culture vanilla. Ouvéa is full of surprises to be discovered.

There are 2 hotels on the island or you can rent a typical holiday cottage, or choose to stay in a local home.

You will instantly be seduced with Ouvéa's 25km white coral sandy beach, the beautifual rocky coastline eroded by the waves and the picturesque vertiginous cliffs in Lekiny. There are a number of natural marvels hidden on the island. Among them are the waterholes; these are natural, perfectly vertical wells in the ground. Some are connected directly to the sea, others are not. With their water colours of deep blue or blueish green, these holes have not yet been fully explored. Jacques-Yves Cousteau explored some of these blue holes, but did not reach the bottom of his last exploration and estimated the bottom to be more than a hundred meters deep. There are roughly a dozen blue holes on the island, but the two best known are the Blue Hole of Anawa and Turtle Hole. They are easily accessible and the locals will not miss the opportunity to help you discover them and offer you their stories.

If you decide to walk around the island, do not hesitate to speak with the locals, they will share their way of life with you and show you how things are done on their island. If you walk along the beaches, you will see fishermen casting round nets out to get their daily catch. Some people will show you how to catch the coconut palm crabs. These prehistoric looking crabs feed exclusively on coconuts. With their powerful claws, they are capable of breaking the coconut shells to feast on the interior's soft flesh. The mangrove crabs prove to be very tasty and are often found as snacks on roadside menus. The fauna may seem uninhabited at first sight, but if you keep an eye out, you will see the green parakeet of Ouvéa, an endemic species, or the giant bats of the island. These bats feed mainly on fruits and pollen and fly by both, day and night. There are plenty of other residents on the island, such as multicoloured butterflies, lizards and other sea birds.

When it comes to diving, Ouvéa will delight you. In the South, just before the bridge which connects the main island with the island of Mouli, you will find a campsite on the left. This is where to find the only dive centre on the island and the only guide for your family excursions whose name is, Pierre. Pierre will set you on a discovery of the South, introducing you to manta rays, grey sharks and other marvels of the lagoon. At the very tip of the south, the road terminates at a small parking lot where you gain access to a small beach. Strewed with fossilized coral, crevices and its white sandy beach, this place invites you to take a plunge into the turquoise blue waters. You must be aware of the current here, especially in shallow water. By going on further right, you will find a small lagoon in a calm area with a maximum bottom depth of 8-10m. The caves, cliffs and other rocks are covered with corals of all colours.

Moving on to the opposite direction in the north, make a booking with Antoine, the local guide on the other side of the island. He will take you over to 'The Shark Nursery'. You will be led over to the end of the path and continue to walk onto the beach to cross a small pass which leads to the entrance of the mangroves, which guards the lemon sharks. During the summer months, dozens of lemon sharks come to the lagoon to mate and put the beat back into the mangrove's swamp.

A little further along the beach, you can stop and grab a small snack with a view that will take your breath away as you come to face two islands and a small lagoon. You will take the moment to dive in once again into the turquoise blue water for an extra hour or two. Here, the turtles, the whitetip sharks, the large stingrays and other tropical fish will leave you with unforgettable memories.

As you can see, Ouvéa is an island where time stands still and life is enjoyed to the max. It carries its name well, as the island that describes itself as paradise. Let us hope that this wonderful place continues to stay so for years to come.

PASSPORT TO PARADISE

FEATURE AND PHOTOGRAPHY **GORDON T. SMITH**

My favourite site was Paradise Pier, where I spent a surface interval taking wide angle shots around the pier itself. The dive site offered hot springs, nudibranchs, ghost pipefish and frogfish galore and it was one of the best sites we dived outside of Lembeh.






Murex Diving in North Sulawesi runs a dive tour consisting of three days each in Manado, Bangka and Lembeh (the final destination being where I had visited the previous two years). My daughter Yanni also joined me this year and we spent ages looking forward to the trip, not only to meet up with old friends in Lembeh, but also to experience some better visibility than our local diving here in the UAE. As we previously enjoyed diving in Lembeh, we decided to extend that leg by an additional day.

The plan looked like a perfect combination of wall and muck diving, with the potential for seeing something special thrown in. Of course, we were not disappointed.

The route to North Sulawesi requires two flights from Dubai, either via Singapore or Jakarta, we chose Singapore and had some dive retail therapy.

On arrival at Manado, it is wise to have the correct amount for your visa ($35), as change is given back in IDR. It is also useful to have your onward journey e-tickets printed as well as proof of accommodation, as the immigration staff tends to ask all sorts of questions.

In the throng of resort representatives, family and friends outside the terminal, our enquiry about "Murex" resulted in an echo across the crowd until Murex claimed us as theirs. I like how all the people here in the dive industry help each other; even though they are in competition. Our drive to Murex resort took over 90 minutes because we had to navigate through the busy Friday traffic in Manado. Unfortunately, this meant we didn't have time for an afternoon dive when we arrived.

At the resort, a staff member, Tommy gave us a quick tour of the area and helped us sort out the paperwork. In the following days, we were only joined by a few more divers, only one of which (Joe) was on the Passport to Paradise trip with us. We also met other staff members including Pim, who runs the diving, and Oce, our dive guide.

The accommodation was more basic than expected and not as good as Lembeh Resort, but it was clean and suited our purpose. My largest criticism is that there was no camera room. Although I set up the equipment on the table inside our room, it was poorly lit and I therefore spent some time preparing both housings – one for macro and one for wide angle.

None of the tanks at Manado or Bangka had valves for DIN regulators, so I had to use an adaptor that they provided. This was not an issue for Lembeh. Surprisingly, we had to buy electrical adaptors, as their sockets were EU design, which did not suit most of my plugs. This has never been an issue in other resorts I have stayed in in Philippines and Indonesia, as most places supply adaptors for free.

On the first day of diving, I was in the water at 6:15 and did a short solo dive on the house reef with both housings just to check that everything was okay. After breakfast, we were on the boat for the rest of the day. The

boat took us on double-tank dives most days (usually wide angle), with lunch on the boat, followed by a third dive, which was usually muck. As there were only three other divers during the time that we were there, we had the boat (almost) to ourselves. The resort was almost deserted apart from some of the owner's extended family staying there due to a family wedding.

All of Murex dive boats are similar. They all have a toilet on board as well as a freshwater container to soak the camera gear in between dives. The crew set up the dive gear on the boat every morning, although it is best to check everything before the boat leaves. After the day's diving all the gear is rinsed before being put into allotted lockers.

Our guide Oce was brilliant and he stayed with us throughout our stay in Manado and Bangka. This meant we had a good relationship with him after seven days of diving and I would definitely recommend him as a guide.

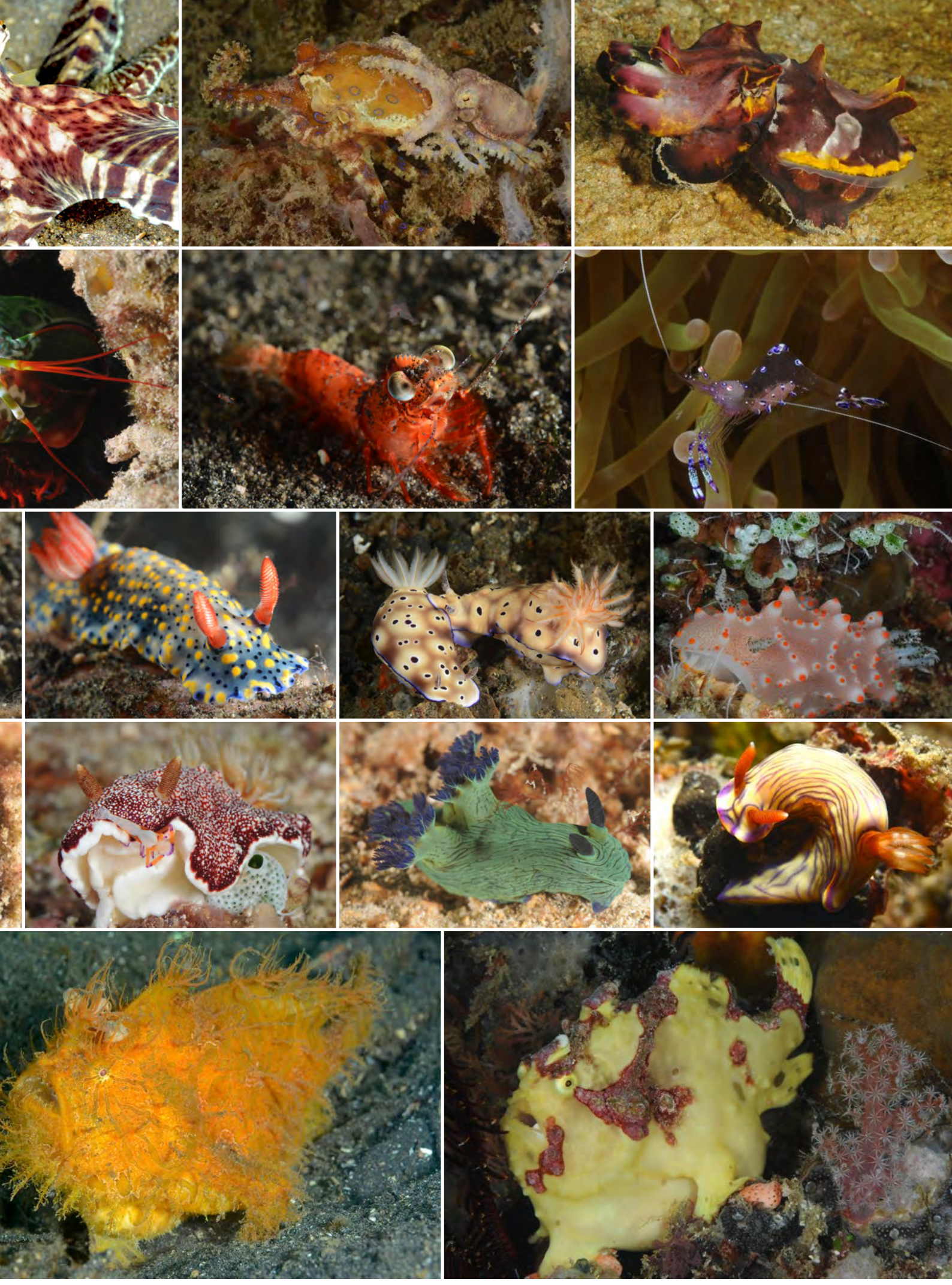
Diving Bunaken was wonderful, with excellent visibility of 20-30m! Coupled with great walls, I had the opportunity to shoot wide angle, something that is nearly impossible here in the UAE with its limited visibility. We experienced some brilliant wall drift dives and we both thoroughly enjoyed it. We also had the opportunity to do a house reef night dive. The highlight of this dive was a spanish dancer towards the end at about 3m.

Unfortunately on the second day, Yanni's housing for her small point-and-shoot flooded. As a backup, I loaned her my Canon PowerShot D30, waterproof up to 23m, and she took some amazing shots with it using a Sola 800 light. When we reached Lembeh, she borrowed by Nikon D300 with 60mm macro lens and a single strobe.

The second part of our Passport to Paradise involved two dives en route to Bangka. Our suitcases were loaded onto the boat and covered with a tarp and off we went. When we approached Murex Bangka, the waves got higher, with a large 2m swell. This made docking at the beach rather challenging for the crew, with lots of shouting and throwing of ropes while reversing back to the beach.

Accommodation at Bangka was a basic wooden hut on a beach, but I preferred the setting to Manado. The staff was also good and the owners (Danny and Angelique) were also around with their extended family. The resort was buzzing with guests, which was quite a shock after our quiet time in Manado. However, we still retained a boat and guide between myself, Yanni and Joe. Bangka also offered a small camera room, for which I was thankful.

We had the opportunity to chat with Mark Erdmann (senior advisor on all things conservation at Conservation International as well as the discoverer of the Coelacanth



population off Bunaken in 1999). He enlightened Yanni on the controversial mining on Bangka and the disappearance of megafauna (Mantas in particular) around North Sulawesi due to hunting.

The food in Bangka was much the same as Manado – buffet style for all meals. The variety was tasty but limited and it was luxurious to have five-star cuisine when we eventually arrived at Lembeh. The Internet was also limited to the common areas for both resorts and as Bangka was busy, it was particularly slow there.

During our stay, we encountered a very strong southerly wind and this posed a major issue for diving on Bangka itself. Eventually, we ended up with only one dive on Bangka (Tanjung Usi 1) with all other dives over on the mainland. My favourite site was Paradise Pier, where I spent a surface interval taking wide angle shots around the pier itself. The dive site offered hot springs, nudibranchs, ghost pipefish and frogfish galore and it was one of the best sites we dived outside of Lembeh.

Our transfer to Lembeh was also meant to be by boat with two dives on the way. However, the weather was still too rough and we had to alter our plans. I decided to have the morning off while Yanni and Joe did a dive off the mainland. We then headed to Bitung by road, which took over 2 hours through the mountainous terrain. The crossing over the strait only took 10-15 minutes and the new managers of Lembeh Resort, Morten and Petra, greeted us like old friends.

Lembeh Resort and the dive op, Critters@Lembeh, are run separately. The dive op is the jewel in Murex's crown and is well set up and run by Sasha and Lauren, with a resident marine biologist, Dimpy, available to answer any questions. All the guides are fantastic, but we requested Iwan, who was excellent with us last year. Their camera room is first class and probably one of the best I have used, with plenty of space and sockets with adaptors for all types.

Lembeh was also busy and Yanni, Joe and I ended up sharing a boat with three Americans. We found many excellent subjects to photograph, but some were "stolen" before we were finished, which I found annoying. We saw the usual horde of nudis, ghost pipefish and frogfish, but the most special moment must have been when we witnessed the mating of two blue-ringed octopus. The best dive was certainly the night dive; where we were lucky enough to find two Bobbitt worms as well as two stargazers, large snake eels and humongous crabs out hunting.

The water temperatures during the trip were around 28-29°C in Manado, 27-28°C in Bangka and a chilly 25-26°C in Lembeh. Doing several dives over an hour long each everyday requires a decent wetsuit. Unfortunately, my Fourth Element 3mm Proteus did not arrive on time so I had to make do with a Mares 3:2:2 and a Fourth Element Thermocline Explorer under it, plus a hood for the Lembeh dives.

The total cost of the Passport to Paradise was $4,762 for two of us sharing over 11 nights, with EAN32 for all dives. Personally, I did 26 dives and Yanni did 24 during that period.

WOULD I DO IT AGAIN?

Probably not – bearing in mind the original set up is for 9 days, the changes of location over such a short period of time reminded me too much of business trips.

After Lembeh, we had planned to go to Siladen to visit Ana and Miguel (the previous managers of Lembeh Resort). However, at the time of leaving Lembeh, I really wished we were staying on for those additional 4 days, despite the warmer waters waiting for us in Siladen.

In retrospect, one week at Lembeh and one week at Manado or Bangka would have worked better, with only one move in two weeks. Hopefully this won't be my last trip to Lembeh.

SCUBA DIVING IN THAILAND – PHUKET

FEATURE AND PHOTOGRAPHY **PAUL WARWICK**

Almost everyone knows about Phuket in Thailand; a paradise holiday destination, a tropical party island and haven for the hedonists, but did you know that it is also a great diving destination? It lies in the Andaman Sea to the west of mainland Thailand and Malaysia and is an area renowned for its marine life and especially the spectrum of macro creatures which inhabit the vast array of reefs and wrecks.

Phuket is one of the 76 Provinces which make up the country of Thailand and it is the largest island in the country. Bounded by water with two bridges connecting it to the mainland, Phuket lies in the south part of the Andaman Sea and is one of the most affluent Provinces in Thailand. Formerly deriving much of its wealth from the export of tin and rubber during the days of colonialism, tourism and to a lesser extent agriculture, provides the main sources of income for Phuket today and it is a popular tourist destination.

The relatively recent name "Phuket" is apparently derived from the word bukit which in Malay means "hill", as this is what the island appears like from a distance. An alternative suggestion is that the name originates from two Thai words, "phu" (mountain) of "ket" (jewel), and this is said to be recorded in a Thai chronicle. Phuket was formerly known as Thalang (Tha-Laang), derived from the old Malay "telong" (Jawi) which means "cape". The northern district of the province, which was the location of the old capital, still uses this name. In Western sources and navigation charts, it was known as Jung Ceylon (a corruption of the Malay Tanjung Salang, i.e., "Cape Salang").

The island is surprisingly big and accommodates a huge number of motels, hotels and resorts, of various standards and quality, which are scattered around the coastline and with some inland. Phuket is one of the most affluent provinces in Thailand. As a result of the exponential growth in tourism the indigenous Thais and those who work on Phuket earn about 6 times the national average wage. As a result, as well as tourism there is a large transient local population of workers who commute to Phuket from elsewhere in Thailand on a weekly or monthly basis to work in the tourist industry, or those services which support it.

Business and the economy on Phuket is based upon a thriving tourist industry which involves as many other locals and local businesses in what you do, so we used a taxi to get to the Dive Centre, then a different vehicle (a large Tuk Tuk) was used to get us from the Dive Centre to the Harbour, then the Boat was run by another company and the catering onboard which provided breakfast and lunch was run by someone else. Good job that you only have to pay one person – the Dive Centre!

HOW TO GET THERE AND WHERE TO STAY

You can fly straight into Phuket International Airport from almost anywhere either by scheduled or charter flights. We flew direct from Abu Dhabi using ETIHAD arriving in the early evening. Depending on your nationality, you may not need a visa provided that you have a return ticket with a valid departure date. Most hotels and resorts will provide either courtesy transport or arrange a taxi to collect you and take you to your accommodation. Taxis are relatively cheap so it is easy to get around or alternatively rent a scooter or moped, which is how most of the locals seem to get around and will really put you in the "thick of things".

There are numerous places to stay in Phuket and to suit every single budget from backpacker to millionaire! As a visitor you just need to decide what the focus is for you holiday and plan your accommodation accordingly. Resorts are too numerous to mention and provides everything for the visitor, but little in the way of true indigenous culture. To find that you have to get "out and about" either by taxi or if you are brave enough to hire a scooter or moped, although it is not without its risks! Nowhere is very far and getting around is easy but not if you are of a nervous disposition when others are in control of the vehicle – the driving is crazy and you need eyes in the back of your head.

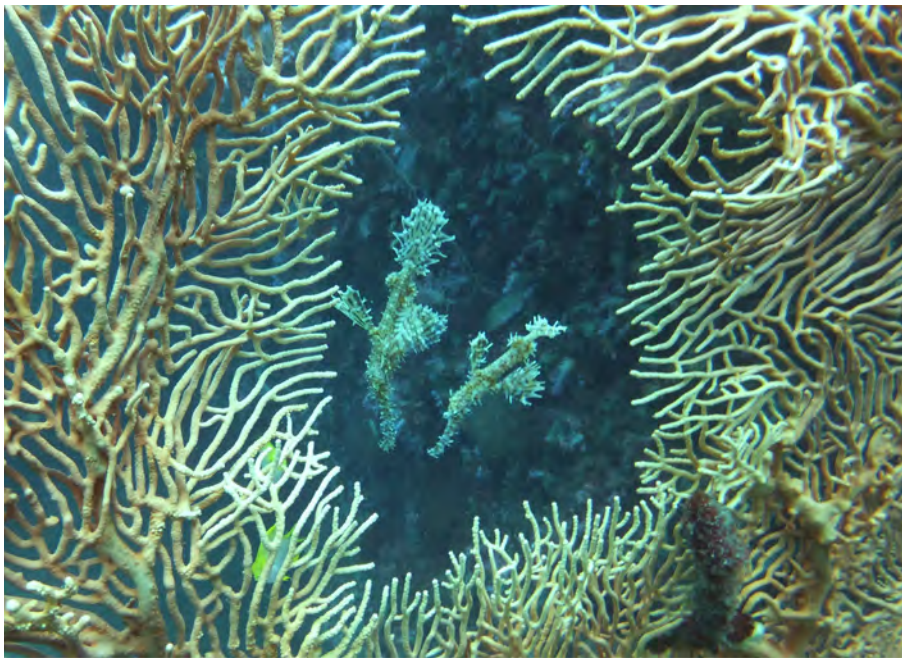
We stayed at the Laguna Resort which is an integrated complex of seven 5 Star Resorts which have been built on the site of a "worked out" Tin Mine utilizing the old workings and water courses to shape the complex (having cleaned up the contamination from the tin extraction of course). Each of the Resorts offers a slightly different style and approach to 5 Star luxury and cuisine – you can literally get anything at anytime. The beach areas do accommodate a couple of local restaurants serving more traditional Thai food in more traditional surroundings and is well worth a visit…or two. An internal bus system ensures that you can get around the site fairly easily and there is also a small shopping village for those in self catering hotel apartments.

DIVE CENTRES

Dive Centres on the island are also too numerous to mention, and even in our Complex of Resorts there were several diving outlets to choose from. Having done a bit of research on the internet before arriving and spoken to some of the "resident westerners" (inevitably in a bar) downtown, we opted to use Sea Bees Dive Centre who just happened to have a small centre in one of the Resorts in our complex, but which operated out of Chalong just south of the provincial capital Phuket Town.

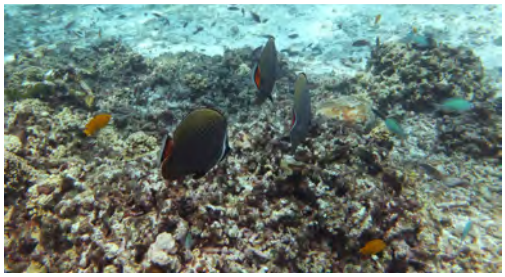
Most of the best diving is in the southern part of the island and so the boats depart from Chalong Harbour. Although nowhere is really that far, chaotic traffic, crazy drivers and the volume of people can add to journeys which originate elsewhere. In our case, because we were accommodated on the northwest side of the island it was about 45-60 minutes to get to the dive centre which made for an early start and a relatively late finish. We all met up at the dive centre which is set back from the Harbour to sort out paperwork and equipment for those that needed it and a much needed cup of coffee! After the "officialdom" we were ferried down to the boats in Tchuck Tchucks, open sided pick-up trucks with an overhead cover, which was novel whilst our equipment was taken down by the staff.

The boats used by Sea Bees Dive Centre cannot be missed at the harbour as they



are all bright fluorescent yellow! The Day Boats (Excalibur II and Aragon) are large, comfortable, well designed and laid out to cater for large numbers of divers, snorkelers and non-divers with sun decks, covered decks and a very spacious dive platform. Everything is well organised and synchronized with German efficiency, interrupted on occasions by the more laid back attitude of the locals which were employed directly or sub-contracted by the Dive Centre. The boats are not fast so be prepared for an all day excursion of 2 or 3 dives, which is not at all unpleasant basking in the sunshine and swapping holiday stories with new found dive buddies. Prices include diving, guides, breakfast on arrival in the morning once the boat has left harbour, lunch and then an array of snacks and there is a cash bar for the return trip. Food is wholesome and ideal for divers and there is water, coffee and tea available throughout the trip.

Sea Bees has a large staff of guides and instructors covering almost every language imaginable. Most speak at least two languages and many speak more. They are all very knowledgeable about the dive sites and took us straight to the places where they knew they could find our marine creatures of choice – in our case it was the Ghost Pipe Fish which was on my bucket list and sure enough, on the second dive there they were (photographic evidence included). Our dive guide throughout was an Australian Instructor, Kelisha, who was taking time off from a sustained period of instructing to just relax and lead qualified divers before heading off to Borneo on a Diving Expedition.



DIVE SITES

Almost all of the dive sites are well offshore and have to be reached by boat. Most are around the plethora of islands which occupy the sea to the south of Phuket and it is not unusual for one island or rocky islet to play host to numerous sites depending on tides and currents. Some of the more notable sites we visited and dived (more than once on some sites) are:

RACHA NOI (East Coast and Banana Bay)

Racha Noi (the small Racha island) is an uninhabited, tropical island south of Racha Yai. The island has excellent dive sites for experienced divers as well as shallow bays for beginners and snorkelers where you can enjoy beautiful hard corals and see all manner of marine life from vibrant reef fish to beautiful Eagle Rays. The diving here reflects the scenery of the Similan Islands. With large granite boulders covered in soft corals and feather stars surrounded by an abundance of colourful reef fish, Racha Noi offers the full spectrum of tropical fish of all shapes and sizes. Then there are the large, gentle pelagic fish like Sting Rays, Manta Rays and Whale Sharks which are commonly seen on dives throughout the year. We managed to fit in two dives, one to the East Coast Bay and the other to Banana Bay, both of which were drift dives around and across the reef complex.

RACHA YAI

Racha Yai is a granite island which means the water is always clear and the many shallow protected bays all around the island make it an ideal trip at any time of the year. Racha Yai is the larger of the two islands and a totally untouched jungle paradise. It is the perfect place to learn scuba diving for snorkelers, and for divers who haven't been in the water for a while. Amongst a healthy selection of hard and soft coral are many Feather Stars and you will always see Titan Triggerfish (beware if they are nesting, they can be quite territorial and aggressive), Moray Eels, Cuttlefish, Octopus and Giant Puffer Fish. You can also see Trumpet Fish, nose down in the reef hunting for food. Cornet Fish are ever present as are large schools of Twin-spotted Snapper, Dog-eyed Puffer Fish and Parrotfish. Some Anemones can be found scattered amongst the hard corals with Western Clownfish in residence. In the deeper sandy areas you'll discover Garden Eels and Blue Spotted Rays. Leopard Sharks are occasionally seen here as well.

SHARK POINT

Shark Point is one of Phuket's best dive sites and was given official marine sanctuary status in 1992. It's made up of 3 large rock pinnacles, the largest of which breaks the surface. These rocks/reefs densely covered in Anemones, Soft corals, Sponges and Gorgonian Fans and the entire complex abound with life. The sheer density and diversity of coral and fish life makes diving here a wonderful, sensual experience. Leopard Sharks are often seen resting on the sand. Stripped or Banded Sea Snakes, Giant Barracudas and Trevelly are also common, along with an impressive number of Moray Eels. It is impossible to describe the variety of sea life in a few simple words.

KING CRUISER

The King Cruiser was used as a car and passenger ferry between Phi Phi Islands and Phuket. In May 1997 the ferry struck either Anemone Reef or Shark Point and sank between the two. The wreck is 85m long and sits on the bottom at 32m although most of the dive is normally conducted around 25m. The top of the wreck comes up to 15m so there is plenty to see at all depths. The wreck contains a huge car deck, a middle deck with salons and dining rooms and a sun deck with a very interesting captain's cabin. Parts of the wreck have collapsed and advanced penetration is discouraged without proper training and equipment. The wreck is home to large schools of fish and occasionally a turtle or leopard shark can be found resting on the wreck. Lots of small fish such as Lion Fish, Cuttlefish and different varieties of Crabs have already made their home in the wreck. Barracudas and other hunters are also common. As the wreck is sitting out in the open, there is often strong currents and lower visibility.

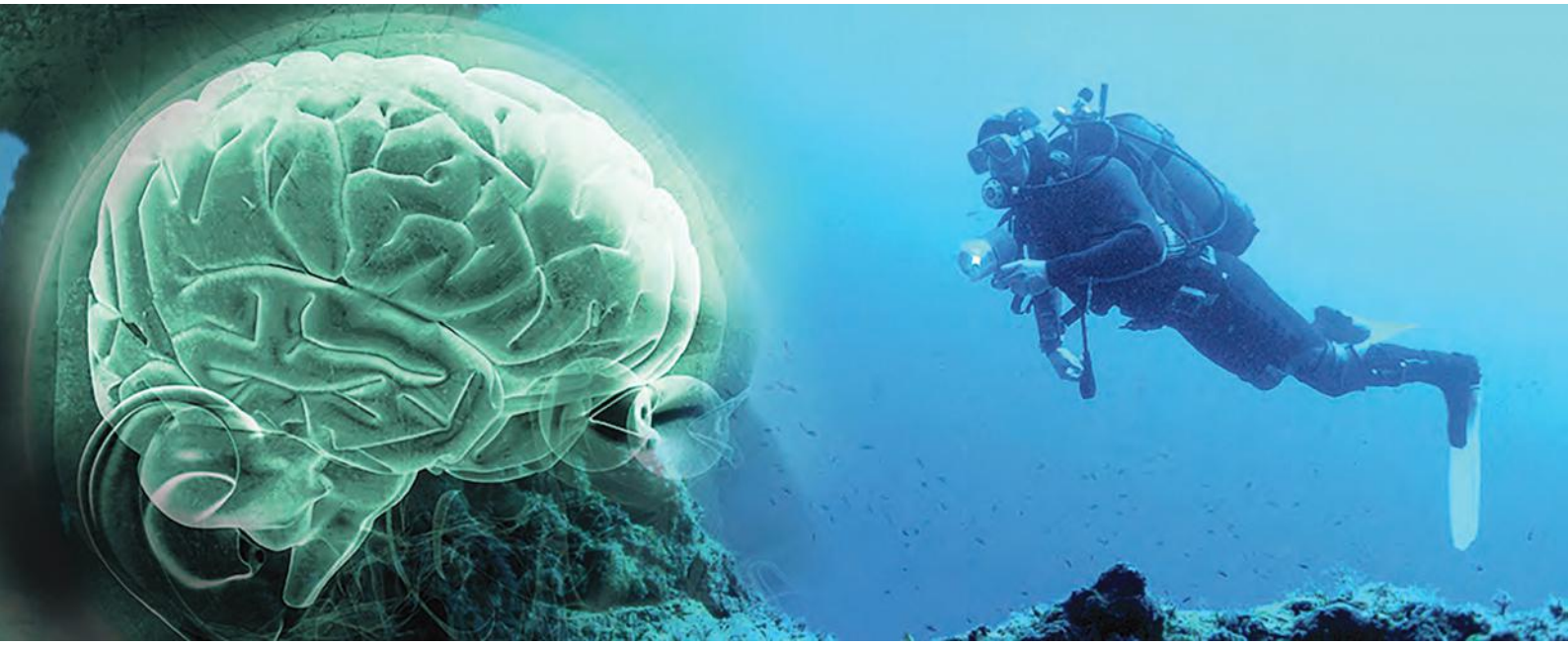
TURTLE WALL

Around the small rocky islet called Koh Bida Nok are a couple of dive sites, one of which is called Turtle Wall. As the name suggests, it is a wall dive which reaches down to over 40 metres but has a large shelf at 16-17 metres. The wall is covered in hard and soft corals, anemones with resident Clown Fish, sea fans and every imaginable species of reef fish, many schooling in and around the wall. It was here that we found our Ghost Pipe Fish in the Fan Corals! The reef fish attract large predators and you can often see Giant Barracuda, Titan Trigger Fish, Napoleon Wrasse and a few different varieties of Groupers. Leopard Sharks can often be found on the sand along with Blue Spotted Rays, Cowtailed Rays and Leopard Rays. Octopus, Lobsters and Shrimp occupy the small fissures and Cuttlefish play in the current. This is a wonderful relaxing dive for all standards of diver, but don't forget to bring the camera.

Phuket's reputation is largely based on being a "hedonistic party island tropical paradise" and that is certainly true, with every town, village and street "sporting" a never ending row of restaurants, bars, clubs of various natures and persuasions and an incredible number and variety of massage parlours! But the province and island of Phuket has much to offer in those looking for culture, cuisine, relaxation, eco-tourism and adventure. We took the opportunity to take in a little bit of everything, diving (of course), relaxation and culture. The Thai people are extremely friendly and welcome you to their country with open arms and importantly look after you whilst you are visiting. We are looking forward to our next Thai adventure which could be Koh Samui, or Koh Tao or Pulau Langkawi or Krabi.

EFFECTS OF DIVING ON THE BRAIN (PART 1)
CAN DIVING HAVE LONG-TERM HEALTH EFFECTS?

FEATURE **JENNA WILEY**



The question of whether diving can have deleterious, long-term health effects emerges from time to time but appears unanswered so far. Possible neurological complications from acute dive injuries are undisputed, but some studies show evidence of lesions in the central nervous system of divers with no history of decompression sickness (DCS). These subclinical lesions or "white spots" in the brain are detected with magnetic resonance imaging (MRI), a method very sensitive to changes in the brain. It is not clear whether they are more common in divers than in nondivers, nor is it certain that their presence has any importance.

In some studies, measurements of neurological function also indicated abnormal results in divers. These measurements included neuropsychological assessments such as memory and concentration tests, electroencephalograms (EEGs), which detect electrical activity in the brain, and single-photon emission computed tomography (SPECT) scans, which measure cerebral blood flow. In the Geneva "Memory Dive" study (Slosman DO et al., 2004), reduction in cerebral blood flow and neuropsychological performance was associated with a history of high dive frequency (more than 100 dives per year), dive depth (deeper than 40m) and dive environment (cold water).

Establishing a causal relationship to diving and determining the pathological mechanisms of these brain lesions is difficult. Factors such as age, history of head injury, alcohol consumption, migraines, smoking, hypertension, high blood cholesterol, infection and presence of a patent foramen ovale (PFO) appear associated with these findings. Often, bubbles traveling through cardiac chambers and visualized using ultrasound do not cause any symptoms; these "silent bubbles" could cause the subclinical lesions.

A few studies have focused on the influence of a PFO, an opening between the right and left atria that can vary in size and is found in about 25 percent of the population. Bubbles formed as a result of decompression stress could theoretically travel from systemic circulation to the heart, cross from the right side to the left through the PFO and enter arterial circulation and, potentially, the brain. This mechanism mimics paradoxical embolism, in which a clot from a deep vein crosses through a PFO and ends up in the brain, causing a stroke. Although the presence of a PFO is considered a risk factor for brain lesions, so far there is no unequivocal evidence of a causal relationship between PFOs and silent injuries.

Additional evidence shows that breath-hold divers exhibit central nervous system effects as well. Acute strokelike injuries in breath-hold divers are well documented. A Swedish study showed that prolonged voluntary apnea can transiently increase levels of a brain-damage marker protein, even in the absence of symptoms of acute injury (Andersson JP et al., 2009). The researchers proposed that exposure to severe hypoxia could cause neurological damage over time. The risk of asymptomatic neurologic events and their possible long-term effect in divers remains unresolved. We ask the experts.

What, if any, evidence is there for brain lesions in divers without any history of DCS?

RICHARD MOON: Some studies, using MRI, observed a greater number of brain lesions in divers compared to nondivers. So far no relationship between the number of lesions and the number of dives has been established, which suggests that the lesions are not related to diving itself.

GÜNALP UZUN: Studies conducted in the last 20 years aimed at illuminating the presumed correlation between diving and brain lesions revealed conflicting results. Due to methodological differences among the studies, it is not possible to pool the data and reach a clear conclusion.

Consistent with some earlier reports, we found a higher incidence of white-matter lesions in asymptomatic military divers compared to nondiving controls (Erdem et al., 2009). A positive correlation, however, does not always imply causation. Most of these studies (including ours) did not establish any significant relationship between white-matter lesions and diving indices. Even if divers had increased numbers of white-matter lesions, their clinical relevance and association with neuropsychological symptoms has not yet been clearly defined.

KAY TETZLAFF: There is an abundance of studies that investigated MRI in a variety of diving cohorts, and many of these reported associations between parameters of diving exposure and presence of brain lesions on MRI.

However, none could actually prove a causal relationship. A fundamental flaw in study design has been the possibility of a selection bias, in that the lesions in the selected divers could have been pre-existing. In fact, the studies could not disprove a hypothesis that the decision to start diving may be the first sign of brain damage. One way to reduce bias would be a longitudinal follow-up of a cohort of divers from the beginning of their diving career compared to a cohort of nondivers while controlling for confounding risk factors such as alcohol intake, smoking, hypertension and others. Such a study has yet to be reported.

What is the relationship between a PFO and brain lesions?

MOON: There is a weak relationship between the presence of a PFO and the presence of these lesions. But again, there is no evidence that these lesions indicate brain damage.

UZUN: So-called "silent gas bubbles," which may be detected even after dives in shallow water, do not produce clinical symptoms and are generally filtered through the pulmonary vasculature. A PFO, an opening between the right and left atria, may serve as an entry point for silent gas bubbles into the arterial circulation.

It is hypothesized that these bubbles can interrupt small vessels in the brain and cause white-matter brain lesions. Indeed, a number of studies demonstrated that divers with a PFO had an increased risk for white-matter lesions compared to divers without a PFO. There is no general recommendation that asymptomatic scuba divers should undergo examinations for PFO detection. However, a diver with a known PFO should use a conservative dive profile to reduce the risk of DCS.

TETZLAFF: A PFO increases the risk of decompression illness (DCI) and thereby may also enhance brain lesions on MRI. It has been estimated from a clinical study that divers with a PFO have a 4.5-fold increase in DCI events and twice the incidence of ischemic brain lesions compared to divers without a PFO (Schwerzmann M et al., 2001). However, it should be noted that diving even with a PFO is considered safe when dives are performed according to guidelines. Note that it is not the PFO that causes injury but the presence of gas bubbles during or after the dive. The bubble load can be minimized by avoiding risk factors such as deep dives, cold dives and decompression dives.

What are other possible mechanisms of formation of the brain lesions known as white spots?

MOON: They could be related to normal aging processes such as changes in blood vessels.

UZUN: White spots of the brain observed on MRI are actually common in elderly people and may be associated with head injuries, alcohol consumption, migraines, smoking, hypertension and/or high blood cholesterol. It is generally accepted that white-matter lesions represent parenchymal damage due to cerebrovascular disorders or cerebral ischemia.

TETZLAFF: White-matter hyperintensities are regarded as typical MRI expressions of cerebral small-vessel disease. Pathological correlates are varied with most pointing toward white-matter hyperintensities as a reflection of small-vessel ischemic burden. The predominant clinical associations are with stroke, cognitive impairment and dementia. The prevalence of white-matter hyperintensities increases with age.

The discussion continues in the second part of the article which will be published in the December issue.

MEET THE EXPERTS

RICHARD MOON, M.D., obtained his medical degree from McGill University in Montreal, Canada. He is the professor of anesthesiology and medicine and the medical director of the Center for Hyperbaric Medicine and Environmental Physiology at Duke University Medical Center in Durham, N.C.

GÜNALP UZUN, M.D., is an associate professor of underwater and hyperbaric medicine at the GMMA Haydarpasa Teaching Hospital in Istanbul, Turkey.

KAY TETZLAFF, M.D., is associate professor of medicine in the department of sports medicine at the university of Tuebingen, Germany, and a consultant in diving and hyperbaric medicine.

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AIR, NITROX AND FATIGUE

WHY MIGHT DIVERS REPORT FEELING LESS TIRED AFTER DIVING WITH NITROX?

FEATURE **MATIAS NOCHETTO, M.D.** PHOTOGRAPHY **DAN EUROPE**

Compressed air has been the standard and most widely used breathing mix in recreational diving for decades. Breathing-gas mixtures with a lower nitrogen content and higher oxygen content (enriched air nitrox) have gained popularity among divers looking to increase their bottom times or reduce the decompression stress of typical-duration dives. Today, after some 25 years of nitrox use in recreational diving, divers and scientists have gained very valuable operational experience. But some divers have made an observation for which science does not provide any evidence. Namely, they often report feeling less tired after diving on nitrox.

Is there any solid evidence to support the observation that nitrox reduces fatigue? What is a possible scientific explanation for this phenomenon?

Tiredness, or physical fatigue, is a physiological consequence of extraordinary physical activity. It is characterized by a subjective feeling of a transient reduced capacity to perform ordinary physical activities; it is often associated with somnolence and lethargy and sometimes with suboptimal cognitive performance. Fatigue is not uncommon following inconsequential dives in the absence of apparent decompression sickness (DCS), but it's also frequently reported as a symptom of DCS.

Controversy surrounds divers' subjective reports of reduced fatigue following nitrox dives. Contrary to these perceptions, objective studies have not found a reliable difference in fatigue or cognitive performance following dives on air versus nitrox.

Given an equal depth/time exposure, it is generally accepted that the higher the partial pressure of the inspired oxygen (PO_2) and the lower the partial pressure of the inert gas (PN_2), the less decompression stress will be experienced. It is then tempting to assume that lower decompression stress accompanies reduced perceptions of tiredness. However, a higher PO_2 elicits more oxidative stress, and the PO_2 of nitrox will be higher than that of air at a given depth.

Some studies of divers suggest that oxidative stress generated by nitrox's higher PO_2 might cause mild endothelial dysfunction, which may itself lead to some vague symptoms that may be perceived as tiredness. Observations from hyperbaric-medicine clinicians, who report that greater oxidative stress during hyperbaric oxygen therapy is associated with greater fatigue following treatment, support these findings.

We consulted two subject-matter experts to help us reconcile divers' impressions of nitrox's beneficial effects on postdive fatigue with some controversial findings in studies of the phenomenon.

What are some possible causes of postdive tiredness?

RICHARD HARRIS: Postdive tiredness can be the result of multiple factors. Some of them could be dive related, such as thermal stress, decompression stress, energy expenditure, high and prolonged oxygen exposure, anxiety and seasickness. But there are many more potentially unrelated causes such as lack of sleep on holidays, alcohol, jet lag, etc.

NEAL POLLOCK: Many people do not fully appreciate the physiological impact of being immersed in water. An immediate response to the hydrostatic pressure is that a substantial amount of blood normally remaining in the capacitance vessels (veins) of the legs is pushed to the central volume (in the chest). A well-known study of this effect found that an average of 700ml of blood is pushed to the heart during the resting phase of the cardiac cycle. The heart is stretched by the increased blood volume and responds immediately by contracting harder and then, over a short period, by suppressing certain hormones to promote increased fluid elimination through the kidneys. This is a healthy response to the physiological perception of the presence of excess fluid volume. Practically, this is why people have to urinate even after fairly short periods of immersion.

After leaving the water, the diver may experience an immediate drop in the volume of blood returning to the heart. I specifically said "may" because a constricting wetsuit may shift some of the blood to the chest even without immersion. Postdive (or post-wetsuit removal), the diver will experience a decline in the central blood volume and blood pressure. The effect exceeds the simple loss of hydrostatic pressure because the body has been actively reducing the fluid volume during the diving (or wetsuit-wearing) period. Effectively, this set of events likely explains a substantial portion of the normal postdive tiredness. Most important, fatigue is due to immersion, independent of depth and decompression stress.

Are there any reliable data to support claims about nitrox causing less postdive tiredness than air?

HARRIS: No. Three articles in the peer-reviewed literature (see the first three in the reference box) contribute evidence to the nitrox and fatigue question, but I am not convinced that the size and power of any of them have addressed the problem comprehensively.

POLLOCK: The data supporting these claims are not compelling. This is not surprising

since PO_2 increases substantially in response to depth alone. However, there is no reason to argue over whether a person feels less fatigued. Research has shown that the placebo effect has physiological impact, so let the diver enjoy the sense. The important thing is for divers to stay within the PO_2 limits to avoid oxygen toxicity.

Since nitrox's higher oxygen content seems to cause increased oxidative stress, how would you reconcile these apparently counterintuitive effects of nitrox?

HARRIS: One interesting comment from Pierre Lafère's article is that oxidative stress can inhibit neuronal activity (as with alcohol, for example), and this can affect inhibitory neurons, thus (temporarily) increasing arousal levels. On a personal note, my teammates and I have felt very good after 8-17 hour cave dives in 6°C water and maximum depths of more than 200 meters.

Considering the thermal, decompression, physical, oxidative and psychological stresses endured on these dives, how could we reconcile this? Maybe we were just happy to be alive! But I have also felt dreadful, tired and "chesty" after much shallower dives with lower O_2 exposures and shorter run times in warmer water. There are too many other variables to consistently detect a difference just with a simple gas change.

POLLOCK: Oxidative stress certainly has the potential to be problematic, but probably far less so with the typically short exposures associated with most recreational diving. Further research is required to assess the physiological impact.

Would you consider tiredness/fatigue a sign of subclinical DCS?

HARRIS: I believe that fatigue can be a symptom of DCS, but it needs to be something very marked to impress me. Severe fatigue, such as feeling like you have the flu rather than just being "a bit more tired than usual after diving," is a more serious issue. Rather than use the term subclinical DCS, which I do not favor, I would only call fatigue DCS if it is part of a constellation of symptoms.

POLLOCK: Normal patterns of postdive tiredness would not qualify, but "unusual fatigue" markedly in excess of typical levels could be a sign or more likely a symptom. Having the diver describe the nature and degree of the effect is important to help distinguish normal from unusual.

Despite a common impression that diving on nitrox may cause less fatigue than performing the same dive using an air mixture, scientific research to date has not found solid evidence to support such an assumption. As mentioned, the placebo effect should not be underestimated and has yet to be fully studied.

Regardless of what questions future research on this front might answer, it is still appropriate to promote wise use of oxygen-enriched mixtures – not necessarily as a way to extend bottom times but rather as a way to help minimize decompression stress. If diving with nitrox makes you feel less tired after your day of diving, whether you have scientific support for your experience or not, feel free to use it – just make sure you enjoy it safely.

MEET THE EXPERTS

RICHARD HARRIS, BMBS, FANZCA, DipDHM, FFEWM, is an Australian anesthesiologist who works in diving medicine and aeromedical retrieval.

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STOP THE DROPS!

A GUIDE TO PROPER EAR PAIN MANAGEMENT

FEATURE **MARTY MCCAFFERTY**

Ear and sinus injuries are the most common complaints among student and newer divers.

Frequently divers surface complaining of a sensation of fullness in their ear(s). They will often describe it as feeling as though there is still "water in the ears," stuffiness or congestion. Occasionally they will also complain of pain. The individuals that complain of pain need to be managed differently than those complaining of fullness or similar symptoms.

THE BEATEN DRUM

Actual pain, as opposed to pressure or fullness, may indicate a more serious injury. What are the most common causes of ear pain associated with diving? The obvious suspect is a perforated (ruptured) ear drum. Incomplete equalization causes increased pressure on the ear drum most commonly during

descent (middle ear squeeze), but may occur with ascent (reverse block). If not properly addressed through effective equalization, the increased pressure can perforate the ear drum. Bleeding into the external ear canal may or may not be visible. The perforation leaves the middle ear vulnerable to infection and further irritation. Severe middle ear barotrauma can also occur without a perforated eardrum and be just as painful. Many divers believe that complaints of pain can be treated with any common ear drops, but this is not the case.

Here are the reasons why: Any of the drops that are available over-the-counter or mixed at home are intended to prevent "swimmers ear" (infection of the ear canal or otitis externa). The emphasis is on prevention. Once an injury has taken place, these drops do not have any therapeutic value. Almost all drops, regardless of their source, contain some amount of alcohol. In the case of a truly perforated ear drum, the solution will enter through the perforation into the middle ear. Remember that at this point the middle ear is very irritated and sensitive. Alcohol will at least temporarily increase the pain for the individual. Think of it the same way as applying alcohol to an open wound on the skin. Anyone who has ever experienced that should remember how painful it can be. Introducing cold fluids into the middle ear or the ear canal can cause vertigo, nausea and even vomiting until the fluid is warmed. Even in the absence of a perforation, the alcohol can still cause pain due to the severe irritation of the ear drum. Further injury from the drops is unlikely, but they are of no help in this particular instance and can cause unnecessary pain.

In rare cases a diver may have a buildup of ear wax (impacted cerumen) that acts like an ear plug. This creates an air space between the cerumen and the ear drum that cannot be equalized. On descent, the cerumen may be forced farther into the ear canal, causing pain. Again, drops used to prevent otitis externa are of little or no value in this situation.

FEELING FULL

What about the divers who do not complain of pain but the sensation of water or fullness in the ear(s)? Would drops be appropriate in the absence of pain? When there is inefficient equalization the increased hydrostatic pressure causes the ear drums to bow inward. This creates a vacuum effect. Due to the laws of physics, vacuums are not particularly sustainable; fluid and blood begin to fill the space. At the same time, the Eustachian tubes begin to collapse. This makes subsequent efforts to equalize even more difficult, if not impossible. The fluid/blood is effectively trapped in the middle ear, causing the sensation of "water in the ear" or fullness. The fluid is not in the external ear canal. In these cases where there is a feeling of fullness or "water in the ears" without pain, swimmers ear drops may not induce pain but they are still of no value because the problem is not in the external ear but in the middle ear. An intact ear drum will prevent the drops from reaching the middle ear. The drops may or may not increase discomfort but, again, there is no reason to suspect that they would help relieve the symptoms. It is extremely important that a diver who complains of any of the symptoms mentioned be discouraged from further attempts to equalize as this can risk greater injury. Obviously, diving should be discontinued.

Any diver who experiences ear symptoms after diving, especially pain, should be evaluated by a doctor. The need for evaluation is even greater for any diver who complains of hearing loss and/or ringing in the ears (tinnitus). Prompt treatment of a perforated ear drum can prevent further irritation and infection. In cases where there is no perforation, a doctor can manage pain, promote healing and rule out a severe injury. Above all, please remember that most ear drops are used to prevent otitis externa and are not intended to treat any injury.

Learn more about your ears and how to take care of them while diving with DAN's online seminar, "Ears and Diving".

DENTAL HEALTH MONTH

Regular visits to the dentist should be a priority on a diver's agenda. Any type of bubble or air space inside your body can cause pain and even physical trauma while diving. Some types of dental work, particularly root canals with temporary caps or crowns covering unfinished work, are not compatible with diving at all. As you ascend and air pressure increases inside your tooth or teeth, your dental work could literally explode inside your mouth, causing injury, accidental inhalation or cause to swallow portions of the dental structure.

Dr. Matteo Bignamini, Dental Surgeon and Owner of The Dental Center is offering a **FREE DENTAL CHECK UP to ALL EDA MEMBERS.**
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UPCOMING EVENTS

GULF ELASMO PROJECT PRESENTATION AT VOX CINEMAS

13 October | Dr. Rima Jabado, Founder and Lead Scientist at Gulf Elasmo Project will be showing a documentary and giving a presentation with a Q&A for EDA members at VOX Cinemas Mercato at 19:30. Please make sure to register as spaces are limited. Call 04 393 9390 or Email projects@emiratesdiving.com

CLEAN UP ARABIA EAST COAST

13 November | Le Meridien Al Aqah Beach Resort Fujairah. Registration is open.

CLEAN UP ARABIA ABU DHABI (VENUE TBC)

20 November | Mina Zayed. Registration is open for Divers Only.

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Emirates Diving Association

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MISSION STATEMENT

To conserve, protect and restore the UAE marine resources by understanding and promoting the marine environment and promote environmental diving.

LEGISLATION

Emirates Diving Association (EDA) was established by a Federal Decree, No. (23) for the year 1995 article No. (21) on 23/02/1995 and chose Dubai as its base. The Decree stipulates the following responsibilities for EDA.

- To legislate and regulate all diving activities in the UAE.
- Ensure environmentally respectful diving practices in all EDA members.
- Promote and support the diving industry within the UAE by coordinating the efforts of the diving community.
- Promote diving safety in the commercial and recreational diving fields through standardization of practices.
- Promote and preserve historical aspects of diving within the gulf region and enhance environmental education to diving and non diving communities through EDA activities.

PUBLISHED BY

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of diving coastline in the UAE

154,000
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$5M+
annual retail value of diving equipment and accessories in the GCC

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