Inspiring People to Care About our Oceans Since 1995

DIVERS FOR THE ENVIRONMENT

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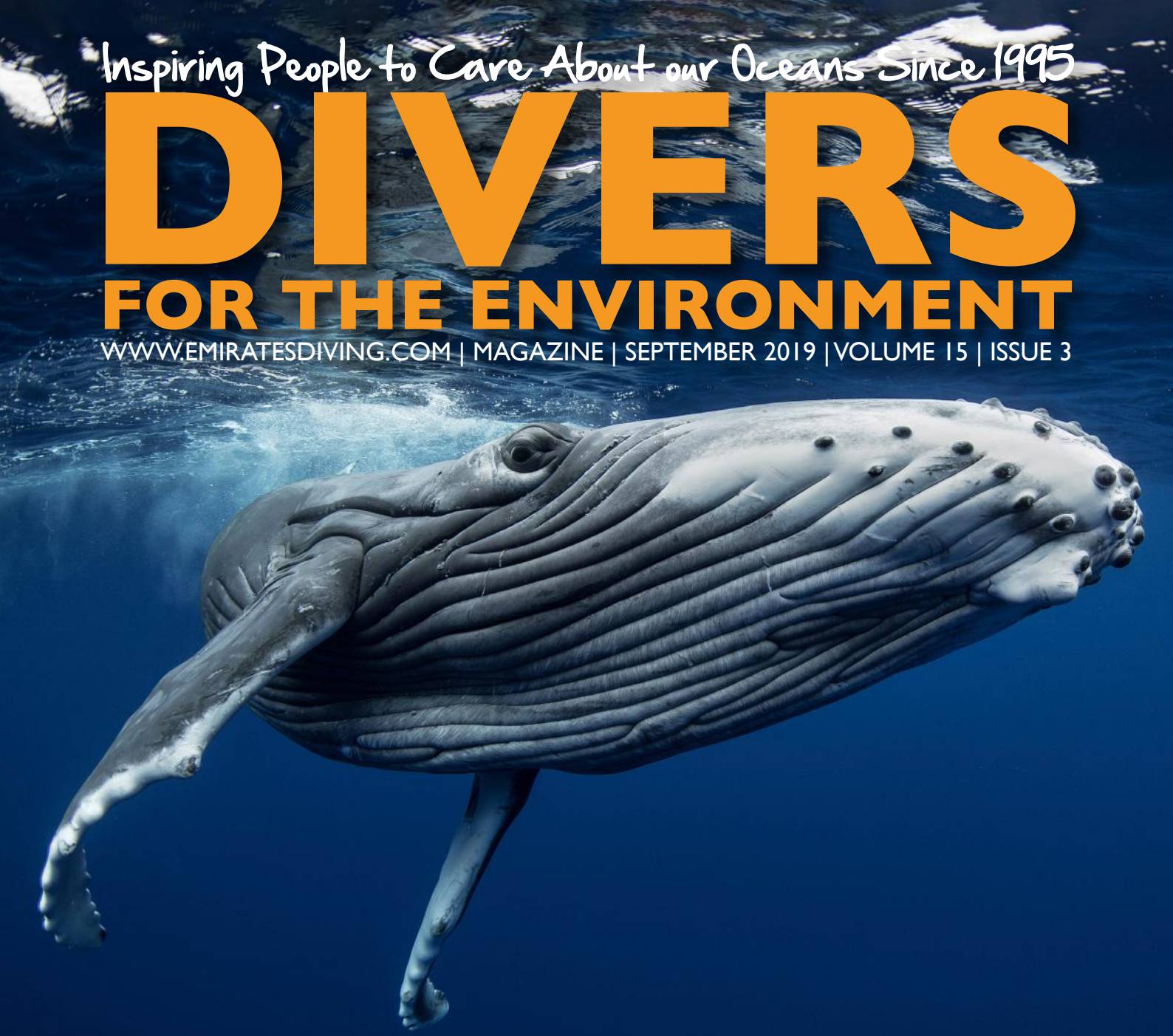

THE ISLANDS OF TAHITI

"Ia Orana e Maeva i Tahiti"

REVOLUTION WITH VOX CINEMAS • **SHARK WEEK 2019** • BONFIRE AND BLACKWATER DIVING • **DIVER EMERGENCY TRANSMITTERS** • MACRO PHOTOGRAPHY • **DIVING DESTINATIONS**


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EDA
جمعية الإمارات للغوص
Emirates Diving Association

REGULARS

NEWS

KIDS CORNER

REEF CHECK

FEATURES

EQUIPMENT REVIEW

UW PHOTOGRAPHY

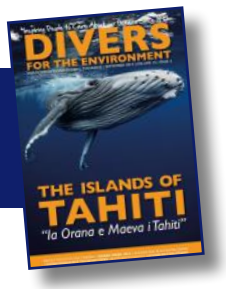
DIVING DESTINATIONS

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's. The magazine is 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 released in December 2019. Send all articles, feedback or comments to: **magazine@emiratesdiving.com**

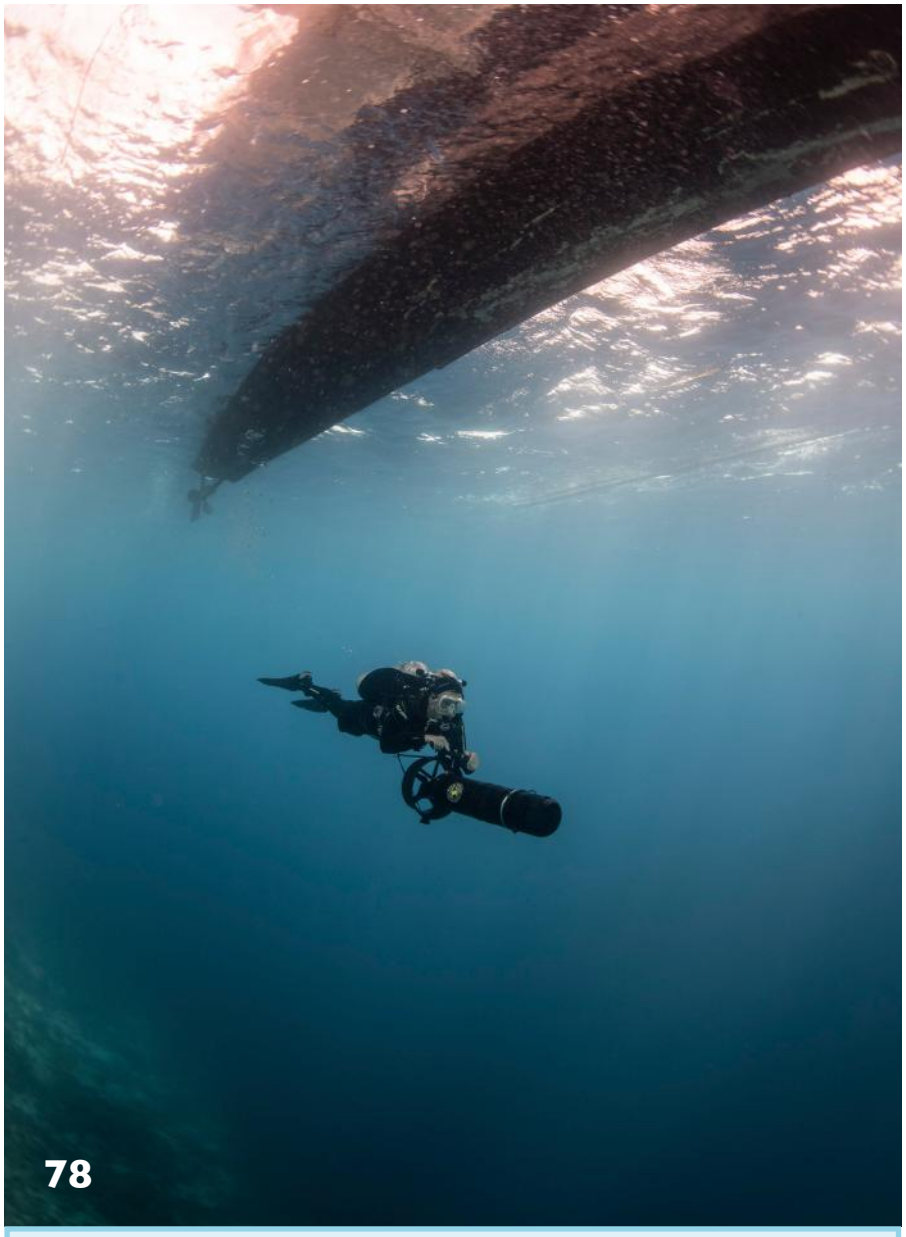
COVER

PHOTO BY RODOLPHE HOLLER
The Islands of Tahiti



REDUCE REUSE RECYCLE

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

EDITOR & DESIGNER

ALLY LANDES
Ally is EDA's Project Manager, Graphic Designer, Writer, Editor, Photographer & Videographer. She created and introduced 'Divers for the Environment' back in December 2004 as an educational tool to share information by professionals, conservationists, scientists and enthusiasts from all over the world, to better care for and protect our underwater world.

COVER STORY AUTHOR & PHOTOGRAPHER

RODOLPHE & CHRISTELLE HOLLER
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Meet the regular magazine contributors who share their passions and interests with our readers. Want to contribute? Email: **magazine@emiratesdiving.com**

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Professionally involved in the diving industry since he started diving in the early nineties, Jesper ran a successful Scandinavian divers magazine for many years. His articles and photos have appeared in books, magazines and websites all over the world. Today he lives in Dubai, involved in marketing but finds time to teach diving to Global Underwater Explorers.

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ALDO GUSTAVO GALANTE
Cardiovascular Surgeon, Rescue Diver and Underwater Photographer. Aldo has travelled to 65 countries, in which he has dived 41 of them. He began his underwater photography in 1996, focusing mostly on capturing exotic species and has portrayed marine life amongst marine debris since 2005.
Instagram: @aldogalante8

PATRICK VAN HOESERLANDE
Diving opens up a whole new world. Being a writer-diver and co-editor of the Flemish divers magazine, Hippocampus, Patrick personally explores our underwater world and shares his experiences through his articles. You'll find a collection of them on **www.webdiver.be**.

عام التسامح
YEAR OF TOLERANCE

CLEANUP ARABIA
THE UNDERWATER CAMPAIGN!

IBRAHIM AL-ZU'BI
EDA Executive Director

It is my great pleasure to present to you our September issue of 'Divers for the Environment'. I hope you have all managed to have a diving holiday and explored somewhere new this summer. It's a wonderful world. As always I am overjoyed with the support, not only on our diving campaigns and clean-ups, but also the quality and quantity of articles we regularly receive from our loyal readers, fellow divers and friends; including those of various dive sites around the world who send in their experiences or advice to other divers and keep us updated on international diving and marine environment and conservation events.

Cleanup Arabia engages more than 1,000 divers and volunteers each year, making it one of the largest diving environmental campaigns in the region. Community groups, businesses, and local governments join EDA members and carry out activities that address local environmental issues. By facilitating local action, EDA brings global environmental change.

Cleanup Arabia is an annual voluntary campaign aimed to clean-up dive sites and beaches of the UAE and the surrounding region. The campaign's objectives are:

- To engage the community and involve people from all walks of life to make a difference.
- Direct people toward positive attitudes in maintaining a clean environment in practice and participation.
- To support continuous clean-up activities.

Part of the campaign is to record the quantities and types of 'refuse' collected each year and to make comparisons with the previous data collections. Data collected is reported to The Ocean Conservancy who organise the International Coastal Cleanup (ICC) and is used in educating the public, businesses, industries and government officials about the marine debris problem.

Cleanup Arabia grows each year, and with this growth comes awareness. We are asking residents across to take action and keep beaches and dive sites clear of marine debris for the sake of our future generation. Involving volunteers from the local community allows them to make a positive environmental impact in their marine environment and to preserve the region's diverse marine life.

EDA's annual 24th Cleanup Arabia will begin in November this year in partnership with the UAE's Ministry of Climate Change and Environment and the local municipalities. I am sure you are all excited to join us to ensure we do the best we can to keep our oceans as clean as possible. 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.

Together we can make a difference!

Dive safe,

Ibrahim Al-Zu'bi

Ibrahim Al-Zu'bi

AN EDA MOVIE NIGHT WITH VOX CINEMAS
REVOLUTION

FILM SYNOPSIS

Revolution is an exhilarating and hard-hitting full length feature film from award-winning Sharkwater filmmaker Rob Stewart. Not only does it shed light on crucial environmental topics and how we can save the planet, but he shows how past world events have taught us what we need to do to save the future.

Filmed over four years in 15 countries, Revolution captures some of the most remarkable wildlife spectacles ever recorded, and gives audiences a firsthand look into the biggest battle ever fought.

Discovering that it's not just sharks that are in jeopardy – but us – Stewart looks to the evolution of life and past revolutions in order to uncover the secrets necessary to save our world. Joining the activists and youth fighting to save their future, Stewart's journey of hope is startling, beautiful and provocative.

Stewart met with renowned world experts who helped him find out about important issues affecting our lives. In an effort to uncover the secrets to a safer world, Stewart goes on an adventure filled with action and drama that will leave audiences around the world, at any age, inspired about how they can get involved in the fight to save our planet. Revolution is not just about the environment – it's a film about hope and inspiration. It's a call-to-action with an uplifting message that tells us it's possible to alleviate the damage already done. It's time for a Revolution!

Revolution premiered at the Toronto International Film Festival in 2015 and went on to win ten awards, including the Audience Award for Best Documentary at the Atlantic Film Festival, Most Popular Environmental Film Award at the Vancouver International Film Festival and the Social Justice Award at the Santa Barbara International Film Festival.

Running Time: 90 minutes


VOX
VOX
VOX


EDA


EDA


EDA


FROM EXECUTIVE PRODUCER GUS VAN SANT
DIRECTOR OF "GOOD WILL HUNTING" & "MILK"
A ROB STEWART FILM
"A STUNNING ADVENTURE!"
SIR RICHARD BRANSON
"A MUST SEE... INSPIRATIONAL AND BEAUTIFUL!"
JEAN-MICHEL COUSTEAU
"IF YOU GO TO ONE MOVIE THIS YEAR, IT MUST BE REVOLUTION."
DAVID SUZUKI
"THIS COULD BE THE MOST IMPORTANT FILM EVER MADE."
BONNIE LAUFER - TRIBUTE
FROM THE DIRECTOR OF SHARKWATER, WINNER OF 36 AWARDS
COMES A STORY 3.5 BILLION YEARS IN THE MAKING
REVOLUTION
WINNER VANCOUVER
WINNER SANTA BARBARA
WINNER TORONTO
WINNER ATLANTIC
WINNER VICTORIA
OPEN YOUR EYES
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SHARK WEEK 2019

BY **ALLY LANDES**

The Ministry of Climate Change and Environment, MOCCAE, has organised this year's Shark Week in coordination with the International Fund for Animal Welfare (IFAW) and Atlantis, The Palm. Kelly Timmins, Director of Conservation, Education and Corporate Social Responsibility at Atlantis, The Palm, kickstarted the campaign on the 28th of July in The Lost Chambers Aquarium. The purpose of Shark Week is to raise public awareness, teaching people about the nature of sharks, their plight in the wild and what people can do to help protect them. Shark Week ran from the 28th of July to the 3rd of August with a range of educational recreational activities dispersed around the aquarium.

Kelly was met by a panel of experts providing context with what is going on with sharks around the world and says, "Conservation relies on partnerships and collaborations, not just from governments, but from non-profits, communities and businesses."

Famed shark behaviourist and conservationist 'Sharkman' Mike Rutzen, makes the special guest headline as he leads Shark Week at Atlantis, The Palm with a selection of events. From the 28-30 July, guests were able to join Mike to enjoy exclusive opportunities to dive alongside him and explore Atlantis' Ambassador Lagoon on a Shark Discovery to see the 11 species of sharks and cownose rays for AED 1,450.

Natasha Christie, Director of The Lost Chambers Aquarium at Atlantis, The Palm said, "We wanted to work with Mike Rutzen because he is one of the world's most hard-working conservationists. By hosting someone like Mike, The Lost Chambers Aquarium is able to help raise appreciation of these magnificent animals and raise awareness of their plight." Natasha has more than 20 years of experience managing large-scale marine exhibitions and is currently responsible for leading all aspects of the resort's aquarium and exhibits, which is home to more than 65,000 marine animals. Christie oversees a team of 50 colleagues, including aquarists, marine biologists and divers, and helps ensure the smooth running of a range of aquatic experiences for guests.

"The most prolific species we've had to date is the Arabian Carpet Shark. This is a small species of shark, it doesn't get any bigger than a metre long, but they can lay several eggs, several times a year and we've collaborated with MOCCAE as well as the Dubai Municipality, where we've had the opportunity to release them into a marine protected area in Dubai and have been doing so since last year. We've also done it with Honeycomb Stingrays which are also a local species. This is a way for us to give back to nature.

We also offer education programmes so the schools in the UAE can come and visit our fish hospital where we talk about shark and stingray reproduction. This is really important and dispels the myth that they are man eaters. We also have mentorship programmes for teenagers who are finishing high school and they can spend a few weeks with us if they want to pursue a career in marine biology."

Hiba Alshehhi, Acting Director of the Biodiversity Department, MOCCAE, shared the UAE's long-standing relationship and learning points with sharks. "In 2002, the Ministry of Climate Change and Environment issued a federal law for the international trade of sharks and one of the important aspects of that law was the policy on shark finning. In 2019 the UAE issued a decree on the conservation of sharks with a no finning policy. There is no exporting or importing of fins allowed in the UAE. Fishermen are banned from catching sharks during certain periods of the year during the breeding seasons. We need to ensure that we have proper conservation and protection for these sharks and their habitats. That we have proper programmes of outreach and awareness for the public to understand sharks. If they're gone, we won't have a stable ecosystem.

We have a committee to raise awareness to make sure we all follow the same message and are all working on the same issue. The UAE has been working on raising awareness

TOP: Natasha Christie, Director of The Lost Chambers Aquarium, Mike Rutzen and Kelly Timmins, Director of Conservation, Education and Corporate Social Responsibility at Atlantis, The Palm. **LEFT:** Hiba Alshehhi from the MOCCAE. **RIGHT:** Dr. Elsayed Ahmed Mohamed from IFAW.

of crucial environmental issues as an integral part of community outreach and working on the studies of sharks. The UAE launched the National Plan of Action for the Conservation and Management of Sharks 2018-2021 where reports take place on identifying species, their status, the threats, and updates will fill in other missing details to help guide the academic sector.

I believe that people will always protect the things they love. Get your kids to love nature, to love sharks, to love the species. You will probably change their mindset and behaviour – you will create a generation to love that nature and they will not be able to stay away from it. If they love it, they will definitely protect it."

Dr. Elsayed Ahmed Mohamed, Regional Director in the Middle East and North Africa, IFAW, trains government officials to effectively carry out the strategies and protocols to protect wildlife throughout the Middle East and North Africa, as well as coordinate training to prevent illegal wildlife trade. As a member of the United Arab Emirates' national CITES team, Elsayed issues CITES permits and certificates, attends national CITES meetings and prepares the guidelines for the country's humane handling of marine life.

"CITES is not prohibiting trade, CITES is regulating trade to ensure the species are caught sustainably. The problem for sharks is poaching, illegal trade and an increase in demand. We need to control this. Firstly, poaching, we agree that the Indian Ocean and the Arabian Sea is one of the hottest spots for catching sharks regardless of what is happening around South East Asia, South America and Spain, so this has to be controlled by legislations. Secondly, we know there is illegal trade for shark finning, there is not much control in the southern most of the Indian Ocean because of the unrest in Yemen and Somalia. Lastly, we have to work on reducing the demand in China."

Mike Rutzen explained, "In South Africa, we took the time and built methods to trap the animal numbers, track how they interbreed, and utilise the tools such as CITES, which is our most important tool we have because all these shark products cross borders. If sharks are in trouble, if they don't cross borders, they don't get the same amount of pressure then they would if they could cross borders. Unfortunately, we are now at a crossroads with I believe, our world population of sharks. If we don't do anything about it, all the animals will go extinct."

TOP 10 THINGS
You Didn't Know About Sharks

1. Sharks have been in existence for more than 400 million years and there are 440 known species.
2. 2/3 of a shark's brain is dedicated to its sense of smell. They can detect electrical pulses, vibrations and pressure changes within the water.
3. Female sharks tend to be larger than male sharks.
4. Some sharks grow and lose up to 30,000 teeth in their lifetimes.
5. As top predators, sharks bring balance to the marine ecosystem by preying on sick fish.
6. Sharks live longer than thought: Most sharks live 20-30 years, however researchers found a Greenland shark estimated to be up to 500 years old.
7. Female shark pregnancies range from 3-5 months, to up to two years.
8. Sharks have no bones in their bodies. They are made of a rubbery tissue called cartilage.
9. Sharks have their own nursery. Young sharks spend up to 7 years in a shallow water "nursery" where they grow and learn.
10. More than 60 shark species worldwide are at risk of becoming extinct.

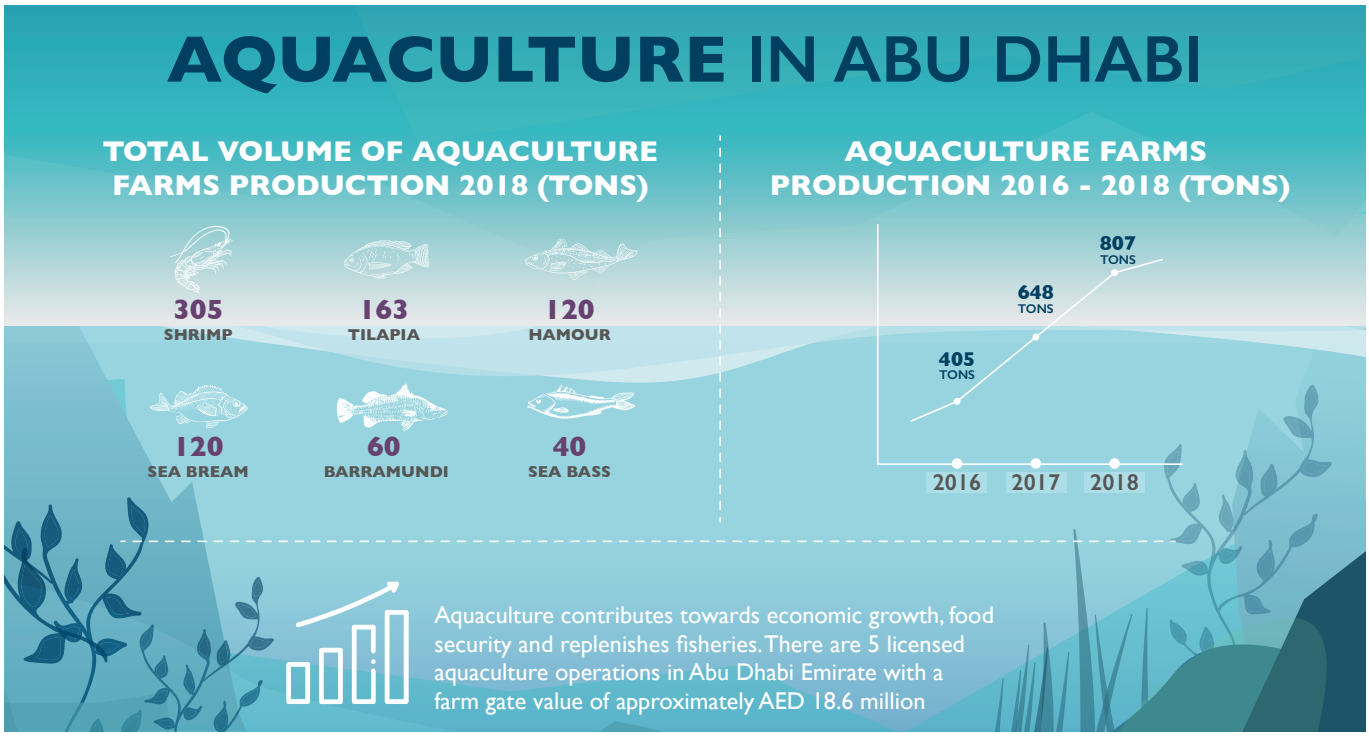
TOP 10 THINGS
You Didn't Know About Sharks in the UAE

1. The Arabian Sea and adjacent waters are home to an estimated 184 shark, ray and chimaera species.
2. The largest fish in the ocean – the Whale Shark- can be found off the coast of the UAE.
3. Whale Sharks love eating plankton and do not pose a risk to humans.
4. The Great Hammerhead Shark, found around UAE waters, is the largest species of Hammerhead Shark and can reach up to 6 metres in length.
5. Great Hammerheads can give birth to up to 55 pups every two years
6. The Green Sawfish, which swim in UAE waters, are often confused as sharks but they are actually rays!
7. The UAE banned all exports and re-exports of shark fins in 2016.
8. The Whitetip Reef Shark is one of the most common sharks spotted in UAE waters and are commonly around 1.5m in length.
9. Whitetips forage at night and spend their days resting in reef caves.
10. Experts estimate 51% of shark, ray and chimaera species in the Arabian Sea and its adjacent waters (Red Sea, Arabian Sea) are threatened with a high risk of extinction.

AQUACULTURE POLICY FOR ABU DHABI TO ACCELERATE DEVELOPMENT OF THE SECTOR

POLICY LAUNCHED BY THE ENVIRONMENT AGENCY – ABU DHABI PROPOSES SIX INITIATIVES

BY **ENVIRONMENT AGENCY – ABU DHABI**



On the 26th of May, the Environment Agency - Abu Dhabi (EAD) announced a Sustainable Aquaculture Policy for the Emirate of Abu Dhabi geared towards promoting the growth of a competitive local aquaculture industry that will assist in reducing pressure on the severely exploited local fisheries. It will also contribute to food security and economic growth for the UAE by producing safe and high-quality seafood products through the use of sustainable technologies that preserve and protect marine biodiversity and ecosystems. The policy is consistent with local directives and strategies including the UAE National Biodiversity Strategy and Action Plan, Abu Dhabi Plan and Plan Maritime 2030, as well as global strategies including the United Nations' Convention on Biological Diversity and Sustainable Development Goals.

Developed in collaboration with federal and emirate-level partners, the policy aims to identify a series of common guiding principles in the development of a local aquaculture sector, which address all pertinent environmental, societal, economic and decision-making aspects. In addition, the policy proposes six initiatives to accelerate the growth of Abu Dhabi's aquaculture industry: updating and streamlining the current permitting process, developing a strategy to identify farming systems and appropriate sites, promoting economic investment in the sector, developing legislation, policies and guidelines, promoting innovation and scientific research in aquaculture and developing communication and marketing plans to attract investments to this sector. The Abu Dhabi Agriculture and Food Safety Authority will be responsible for overseeing the implementation of these initiatives, in coordination with other entities.

Studies commissioned by EAD, in partnership with other entities, indicate that overfishing and the degradation of marine habitats have resulted in alarming declines of fish stock and other marine species – at least 13 species have been harvested beyond sustainable levels, accounting for nearly 80 per cent of the commercial catch and 88 per cent of the commercial fishery revenue. As such, the aquaculture sector presents an opportunity to augment the supply of fish and seafood through the use of sustainable technologies to relieve pressures on declining wild fish populations and ensure the protection of healthy, productive and resilient marine ecosystems.

Highlighting the strategic importance of a sustainable aquaculture sector in Abu Dhabi, Her Excellency Dr. Shaikha Salem Al Dhaheri, Acting Secretary General of the Environment Agency – Abu Dhabi, said, "The sea represents an integral pillar of the history and culture of our nation, providing a lifeline to sustenance, as well as social and economic opportunity. With rapid growth and development, the population of the UAE has risen exponentially to 9.3 million in 2017, placing a critical need on the sustainable and efficient management of our marine resources and fish stocks. The Sustainable Aquaculture Policy is designed to relieve pressure on our fisheries by promoting a domestic strategy to promote a socially-responsible and economically-viable land and sea-based aquaculture sector, which can support the growing consumption patterns in Abu Dhabi and the UAE."

Defined to fit the local context, the policy defines aquaculture as 'the farming of aquatic organisms, including fish, molluscs, crustaceans, algae and aquatic plants for food, aquarium trade, restocking, recreational or commercial and research purposes.' According to EAD's records, production from permitted aquaculture farms in the emirate of Abu Dhabi in 2018 amounted to about 810 tonnes of aquatic organisms such as the local White Indian Shrimp and non-native Sturgeon species, with a total value of approximately AED 18.6 million – a 20 percent increase in production from 650 tonnes in 2017.

EAD has also recently completed the implementation of a Hydrodynamic modelling project that studied three sites in the west and south-east of Dalma Island to determine the carrying capacity of each site and to determine the amount of fish that can be cultured sustainably in marine cages. The project analysed the potential environmental impacts of aquaculture activities on the marine environment, and determined the length of time it will take for it to replenish following the removal of the marine cages.

Following the launch of this policy, EAD will continue to develop plans and procedures, review environmental impact assessments of new aquaculture projects, issue environmental permits for aquaculture ventures and conduct routine inspections to ensure environmental compliance and sustainability.

GREENHOUSE GAS EMISSIONS IN ABU DHABI PROJECTED TO STABILISE OVER NEXT DECADE

NEW REPORT BY THE ENVIRONMENT AGENCY – ABU DHABI PROJECTS THAT SUSTAINABLE DEVELOPMENT STRATEGIES IN THE EMIRATE WILL HELP TO ACHIEVE SIGNIFICANT REDUCTION IN EMISSION INDICATORS BY 2030

BY **ENVIRONMENT AGENCY – ABU DHABI**

On the 8th of July, the Environment Agency - Abu Dhabi (EAD) released the results of its third Abu Dhabi Greenhouse Gas (GHG) Emissions Inventory, which updates the baseline emission levels for the emirate, and refines projections leading up to 2030 – comprising data on both direct and indirect emissions from the energy, industrial processes, agriculture, waste, land use and forestry sectors.

Findings from the inventory indicate that key GHG emissions resulting from human activities, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and hydrofluorocarbons (HFCs), were driven by a surge in the demand for water and energy amid rapid economic and population growth in Abu Dhabi. The report showed that total greenhouse gas emissions in the capital, of which 89 percent were attributed to CO_2, increased during the period 2010-2016 at an annual rate of 6 per cent in 2016 to 135.4 million tonnes of CO_2 equivalent, which is less than 0.3 per cent of total global emissions. This increase was mainly driven by power generation and water desalination, oil and gas extraction and processing, manufacturing and industrial activities, and the transportation sector.

The inventory also demonstrated that existing sustainable development strategies and targeted emissions mitigation measures are helping to ensure that Abu Dhabi remains on track to achieve significant GHG reductions in the mid-term – the emirate's emission indicators are expected to drop to 50 per cent of the current values by the year 2030. While the energy sector was identified as the largest source of GHG emissions in 2016 (78.2 per cent), this sector is also expected to report the most substantial reduction in emissions (37 per cent) over the next decade. The latest inventory also includes information on carbon stored in Abu Dhabi's wetlands (such as the mangroves and seagrass), for the first time.

His Excellency Dr Thani bin Ahmed Al Zeyoudi, Minister of Climate Change and Environment said, "In line with the directives of its visionary leadership, the UAE has embarked on a journey towards a low-carbon, green economy, guided by the UAE Green Growth Strategy that seeks to make economic development in the country more environmentally sustainable. Green economy helps improve air quality with the goal of achieving 90 percent green days annually by 2021, as outlined in the National Agenda of the UAE Vision 2021."

He added, "The Ministry of Climate Change and Environment (MOCCAE) is currently collaborating with the concerned local authorities to develop a comprehensive inventory map of GHG sources and concentrations across the UAE with the aim of identifying emission hotspots and supporting mitigation actions."

His Excellency Dr Al Zeyoudi applauded EAD's role in safeguarding the environment and tackling climate change and noted that the Abu Dhabi GHG Emissions Inventory is an important step towards decarbonizing the UAE based on scientific methods and accurate data.

Patricia Espinosa, United Nations Framework Convention on Climate Change (UNFCCC) Executive Secretary, commented, "I would like to commend the efforts of EAD for the greenhouse gas inventories of the Abu Dhabi Emirate. These will help to further strengthen the base of knowledge needed to address climate change in the context of Abu Dhabi's diverse and rapidly growing economy, and help the emirate fulfil its commitments to the United Nations Framework Convention on Climate Change (UNFCCC). Greenhouse gas inventory information is a key component of the convention and the Paris agreement. These inventories are critical when it comes to making domestic policy decisions. They're also critical when it comes to ensuring transparency of information exchange amongst parties. This builds trust and confidence in the climate process itself."

"The Abu Dhabi GHG Inventory is part of EAD's comprehensive system for monitoring, reporting and verifying information on climate change, and an essential tool that helps us better understand key emission trends associated with rapid economic development, and it allows researchers and policy makers to model changes in emissions over time," said H.E. Dr. Shaikha Salem Al Dhaheri, Acting Secretary General of EAD.

"This tool will also help us develop local policies on climate action with the support and participation of several economic sectors in Abu Dhabi. The Inventory also supports the government in fulfilling its commitments to meet the national and global requirements adopted in Abu Dhabi Vision 2030, the National Climate Change Plan of the UAE, the Paris Agreement and the UNFCCC," she added.

Eng. Shaikha Al Hosani, Executive Director of the Environment Quality Sector at EAD, said, "Abu Dhabi is in a region that is highly vulnerable to the effects of climate change. So, to tackle harmful GHG emissions, we need to keep adopting a concentrated and coordinated cross-sectoral approach. By regularly compiling the Abu Dhabi GHG Emissions Inventory, EAD is supporting both federal and local efforts and policies to reduce man-made emissions in the emirate – an exercise that will also improve air quality and the overall state of the environment.

"Previous cycles of the GHG Emissions Inventory have already seen several entities in the UAE and abroad take serious steps to reduce their carbon footprint. This latest report will build on this progress and advance Abu Dhabi's sustainable growth goals and environmental protection priorities," she added.

The GHG inventories play a vital role in strengthening the capacity of local entities to efficiently track and report their emission footprint. This inventory was developed in partnership with several government bodies, including the UAE Ministry of Climate Change and Environment, the Abu Dhabi Department of Energy, the Department of Transport in Abu Dhabi, ADNOC, Abu Dhabi Ports Company, the Department of Urban Planning and Municipalities, Abu Dhabi Agriculture and Food Safety Authority and Emirates Global Aluminium, among others.

The GHG Emissions Inventory is an initiative under EAD's Air Quality Management Programme. The launch of the third inventory followed the Preparatory Conference for the United Nations Climate Action Summit 2019, which was held in Abu Dhabi this year.

AL JAZZAY INITIATIVE 2019

BY **ABDULLA MUHSEN – DUBAI VOLUNTARY DIVING TEAM**

AL JAZZAY | *jajjay, jizzayah* | is the traditional local name of the process before fishing with nets or cages, when a fisherman searches for a fishing location. Before the catch, he has to make sure that there are fish and that he can identify them – even at night.

REGULATING FISHING PRACTICES

The Ministry of Climate Change and Environment has issued a decree on regulating fishing nets and fishing cages based on the recommendations of the Abu Dhabi Environment Agency. Under the new amendments, it has been decided to ban fishing by nets and cages in Abu Dhabi and to prevent nets from being used by any means in the emirate's fishing waters.

The inspections carried out by the authority resulted in the seizure of more than 25 irregularities which will result in legal procedures. The authority has also removed nylon nets which violate the legal specifications as they could cause the death of endangered species such as dugongs, sea turtles and dolphins.

Studies have revealed that the waters of the emirate of Abu Dhabi are home to the world's largest concentration of humpback dolphins. The commission has worked with its strategic partners for 17 years in order to implement a range of measures adopted to ensure the sustainability of marine biodiversity, particularly threatened species and fisheries. These efforts resulted in the establishment of 6 marine protected areas which comprise approximately 13.4% of the emirate's maritime areas, implementing regulations for licensing commercial and recreational fishing activities, regulating the use of fishing equipment, applying a seasonal ban to protect fish during their breeding seasons, and setting minimum limits on the size of fish that can be caught for some major species. It will cap the number of commercial fishing licenses and ban unsustainable fishing techniques.

Due to the importance of this resolution towards our marine environment in general and the emirate of Abu Dhabi, we at the Dubai Voluntary Diving Team (DVDT) are pleased and honoured to extend our efforts, equipment and tools to implement this resolution and ensure the progress of the authority in the preservation of our environment.

The DVDT launched the 'Stuck Threads' initiative in 2017 – hotline number 055 666 8070 – to allow fishermen and divers to get in contact with the team in case they found any lost fishing nets in the sea of the UAE. The initiative proved a great success and continues to retrieve all abandoned fishing nets reported at all the local dive sites and fishing areas, clearing the marine environment of harm they may cause.

AL JAZZAY 2019 INITIATIVE

The DVDT will inspect dive sites and fishing areas in the waters of Abu Dhabi to ensure they are free of fishing nets to ensure the preservation of the marine environment and to ensure there are no violations of the law.

THE OBJECTIVES

- Support the Environment Agency in the implementation of the net prevention.
- Clean the sea bottom from harmful fishing debris.
- Remove abandoned fishing nets and fishing cages from the seabed which causes the wasteful and unnecessary deaths of fish.

IMPLEMENTATION PLAN

- To make an inventory of all sites in Abu Dhabi which have shipwrecks, coral and rocks.
- Set a timetable for dive trips in coordination with Abu Dhabi Environment Agency and other partners.
- Document all trips in detail.
- Recover any fishing nets, fishing cages or debris found at the agreed sites.
- Coordinate with the concerned authorities to dispose of the waste according to the legal methods.

SITE DETAILS

- Calculate distances from the nearest boat launch areas from the coast.
- Some locations in Abu Dhabi are about 30 miles from the coast.
- Some locations are calculated from Dubai city.
- Some location coordinates are inaccurate and will require further mapping and a new site survey.

REQUIREMENTS

- Boat
- Diving gear
- Marine recovery gear
- Catering

SPONSOR

AL TAYAR TEAM

Al Tayar Team have very kindly covered the full cost of the Al Jazzay 2019 initiative. Both the Al Tayar Team and the Dubai Voluntary Diving Team have signed an agreement for the Al Jazzay initiative on the 26th of July 2019 in the city of Abu Dhabi. We thank and highly appreciate Al Tayar Team's support which will enhance and boost our voluntary activities to the best of our abilities to preserve the marine environment and keep it free of harmful debris.

فريق دبي للغوص التطوعي
DUBAI VOLUNTARY DIVING TEAM

RECORD-BREAKING OCEAN CLEANUP

DIVERS UNITE TO HIGHLIGHT THE URGENT NEED TO STOP THE UGLY JOURNEY OF TRASH AND SET A NEW GUINNESS WORLD RECORD

BY **DOMINO ALBERT, PROJECT AWARE ASSOCIATE DIRECTOR GLOBAL COMMUNICATION**
PHOTO **JACK FISHMAN, PROJECT AWARE CONSERVATION OFFICER**

Ocean pollution and the amount of plastic in the sea is an ever-growing talking point but unfortunately, it's also an issue that continues to be too often ignored. In a bid to change the "out of sight, out of mind" attitude, Dixie Divers, a PADI® dive centre committed to making a difference, has found an inspiring way to highlight the urgent need to turn the tide on the plague of plastic in our ocean with a Guinness World Record.

Supported by Project AWARE® and PADI®, the 2019 edition of the annual Save Deerfield Beach Event, organised by Dixie Divers and Deerfield Beach Women's Club in Florida on June 15, aimed to show that conservation brings more people together now than ever before. Hundreds of divers signed up to the event and came together to put their scuba diving skills to good use.

Guinness World Record adjudicator, Michael Empric, who conducted the official scuba diver headcount, announced that 633 dive cleanup volunteers had taken part in the event.

"One by one by one… A world record is broken. 633 divers. 3200 lbs of fishing gear. Over 9,000 pieces of marine debris reported to Project AWARE. To say today's collaboration of The World Record Cleanup Event hosted by Dixie Divers was a success is an understatement" commented Jack Fishman, Project AWARE Conservation Officer.

The day ended with a huge crowd of beach goers and dive enthusiasts greeting with cheers the announcement that the Guinness World Record for the biggest ocean cleanup had been broken.

The record for the most divers taking part in an underwater cleanup was held by Ahmed Gabr, a former Egyptian Army scuba diver. He brought a team of 615 divers to the Red Sea in Egypt in 2015.

The majority of the debris removed by participating dive volunteers, as part of the Save Deerfield Beach Event, was recorded and reported to Project AWARE's flagship citizen science programme – Dive Against Debris®. The programme aims to empower scuba divers to remove marine debris from the sea floor and report data on the types, quantities, and locations of materials collected. To date, over 50,000 divers from 114 countries have taken part in this citizen science programme in an effort both to cleanup the ocean and build evidence of the global marine litter crisis.

The marine debris data collected by the volunteer divers who took part in the Dive Against Debris® survey dives at the Deerfield Beach Pier will now go through thorough quality review before the results are added to the global Dive Against Debris map.

"What an amazing day for conservation and an amazing day for the dive community," added Jack Fishman. "We are overwhelmed by the success of Dixie Divers' event but we want to emphasise that you don't need to take part in an event to make a difference. We all have the power to create positive change for the ocean each day and every time we dive.

Make Every Dive a Survey Dive and say No to single-use plastic to help stop the Ugly Journey of Trash at the source.

JOIN TWO FIN EXPEDITIONS ON THE 2020 SARDINE RUN

THE ULTIMATE OCEAN SAFARI

BY **NATALIE BANKS** PHOTOS **MORNE HARDENBERG**

As a Scuba Diving Instructor, there is an overwhelming sense of joy whenever you see your students breathing underwater for the first time on scuba. That joy spills over when you see their smiles upon passing their skills and being qualified. But as I let each diver go on his or her merry way, I have at times felt a sense of loss.

Some divers never pick up scuba diving equipment again and as someone whose life has literally been changed by scuba diving, I have felt that something was missing. It is for this reason, and because conserving oceans has now become my career, that I decided to start Two Fin Expeditions last year, giving divers options to see and experience more. For the newly qualified divers, they can rest assured knowing they are with someone who already knows their abilities and to be truly honest, the reasons why they may not be inclined to take that next step on their own. "Explore further" is our motto and I live and breathe this. Fear has often held people back from exploring the amazing marine life this planet provides, but once overcome, there is no going back. As Jacques-Yves Cousteau perfectly stated, "The sea, once it casts its spell, holds one in its net of wonder forever."

I have just returned from my favourite expedition of them all. I am literally still under the spell of all that the sardine run in the wild coast of South Africa provides. It is rugged and raw, it's cold early morning starts, but the wonder of this adventure surpasses anything I have ever experienced. And this year, I got to see a friend and colleague experience it with me. "Epic" was her word for it, for me it's, "spellbinding". Something changes in me each time I visit and I'm never quite the same upon returning. The place has a magical ability to make you pause and just enjoy the beauty of experiencing nature at its best, letting go of anything else that may be going on at the time.

The sardine run has everything that I hate; cold conditions, a lack of sleep-ins, thick and oppressive wetsuits that never quite dry, rooms that smell of wet neoprene and smoke from the fires you sit around at night, but I've just booked my third trip. Me! The person who never returned to the same place twice unless I lived there; or who never wanted a holiday home for fear of getting bored. I'm hooked. The videos and the pictures are mind blowing, but they have nothing on experiencing this at first hand. And I want to experience it with you. I want to share the magic of this place, perhaps get you hooked too, and who knows what that could mean. Perhaps it is the unknown that has hooked me. This is not your average dive trip where you dive a particular reef and can expect to see certain things, this is an experience where the unexpected happens. One minute you are bobbing up and down on a boat after hours of seeing nothing, and then the next minute a humpback whale breaches right in front of you, or a spinner shark jumps out of the water, or a super-pod of dolphins are coming your way. But things start to become epic when your skipper hears or sees something and you are speeding across the ocean to what is potentially a bait ball. Jackets and beanies are being ripped off, weight belts are expectantly being thrown across bodies and done up as fast as possible. You look up and there are diving gannets all around you, electricity is in the air. Fins are being jammed onto feet, masks, snorkels and cameras at the ready. "BALL!" you hear and everyone is in the water with a level of expectation that has peaked. What's on the ball? Is it dolphins, sharks or dare I say, a whale or even three? I do not jest. Last year, I was fortunate to see three Bryde's whales consume a bait ball in around 30 minutes. I'm not sure if epic was the word for this experience, but words fail me here. For me, it's the ultimate of experiences. I've not seen

anything like it before and I wonder if I ever will. It's the stuff of dreams, the things people usually only see on television. But this is only true if you don't give yourself the opportunity. Most of the experiences can be done snorkelling, so you don't even need to be a certified diver to get involved.

Two Fin Expeditions have teed up with an amazing group of people including extremely knowledgeable filmmakers who experience this trip with you. We have made it possible so that all you need to do is commit. We undertake all the bookings, arrange flights ex Dubai, accommodation and transfers. Given how amazing the 2018 and 2019 season has been, bookings for 2020 are filling up fast. This truly is a-once-in-a-lifetime opportunity, the ultimate ocean safari.

For further information, visit **Two Fin Expeditions** on social media, head to **www.twofin.me** or feel free to drop me a line at **natalie@twofin.me**.

2020 SARDINE RUN

Costs ex Dubai:
AED21,000
A$8,500
€5,500
US$6,000

Price includes return flights ex Dubai, one night accommodation in Durban, return shuttle from Durban airport to Durban accommodation, return transfers from Durban airport to and from Port St John (five hours drive – noon pickup/drop-off) 9 days at sea (weather permitting) 10 nights' accommodation at The Jetty River Lodge – AWESOME MEALS – dinners, boat lunch, hot soup daily, continental breakfast and lots of snacks, daily transfers to launch site and scenic drives, dedicated aerial information, cylinders, fills and weight belt, experienced dive guides and skipper.

What is not included?
- Dive insurance/travel insurance
- Dive gear (can be rented if needed)
- Alcoholic drinks
- Dinner on first night

Equipment: Portable air compressor, 10lt dive tanks (DIN/INT), weight belts with 2-7 pound weights, spare: regulators, BCD's, fins, masks for rent on site.

Accommodation: The Jetty River Lodge Satellite TV, en suite, intermittent access to internet via roaming.

Boat: Semi rigid dive boat, 2 x 140hp 4-stroke Suzuki motors, GPS, Fish finder. Licensed by SAMSA for up to 40 miles offshore. Carries 12 people.

Daily Itinerary:
6am - 6h30am breakfast
6h30am transfer to boat
7am - 2pm at sea searching for action (on non-sea days there will be land based activities planned)
3/4pm back at lodge
7pm dinner and fire

Payments:
To secure your spot, a 50% deposit is required. Payment can be made by bank transfer or PayPal for international guests and those in the United Arab Emirates can also pay by cash or cheque. Please let us know preferred payment so we can provide you with the details.

The balance of payment is due no later than two weeks prior to departure. If the final payment is not received by then, we reserve the right to cancel the reservation without notice.

CANCELLATION POLICY
Six months or more notice prior to departure – 100% refund.

180-120 days notice: 75% refund
119-60 days notice: 50% refund
59-30 days notice: 25% refund
29 days notice or less: 100% payable – no refund.

This experience is whatever you wish it to be. We can remove airfare costs and accommodation if you wish to book yourselves and we can also assist with any plans you may have of going to Kruger or Cape Town in addition to the sardine run. Just ask and we will do our best to accommodate.

PLEASE NOTE: These costs can decrease if there is enough interest and we can book group bookings instead of individual ones.

PADI WOMEN'S DIVE DAY

BY **REBECCA KIERMAN – FREESTYLE DIVERS**

International days were created in order to address and highlight important issues on a global stage. Amongst these; the annual PADI Women's Dive Day (WDD) was created in 2015 with a mission to celebrate women in diving and encourage wider participation from women. At Freestyle Divers we took the opportunity to understand what prevents women from engaging in underwater exploration.

Gender equality has endured evolving attitudes, from the Women's movement to where we are today. Although we may not be fighting for the same freedoms, fundamentally the aim is towards the removal of social divides. Most women we asked felt they were not discriminated against, however gender equality is not insular and thus it cannot be expressed entirely as a worldwide movement. Which gives emphasis to the importance of events such as WDD.

Scuba diving stemmed from male dominated military divers and has entered the recreational world since. The Professional Association of Dive Instructors (PADI) emerged at a similar time as the rise of feminism, experiencing mirrored progression of the inclusion of women throughout. Essentially what can be taken from this is that gender equality should not be understood as a problem within diving, but more a reflection of a prevailing problem we have in society.

PADI statistics show an increase from 29% to 39% of women participating in PADI courses, within the last 10 years. It's an incredibly positive step in the right direction, but why are the statistics still not equal? By failing to address the gender-gap present in society, the solutions in diving are circumvented. Systemic barriers expressed by women in diving ranged from claustrophobia, dangerous marine animals and fear of panicking. Objectively these are not gender bias barriers. When considering women in diving, there are no physical or physiological discrepancies in respect to men in diving. However gender stereotypes have led to the misinformation of subordination of women in diving.

As we seek to solve the root cause of barriers to women, it is important to recognise women are not a uniform group. This was evident as we suggested equipment issues might cause a lack of female participation, although some women loathed the pink flowery equipment, others felt this expressed their femininity under the water. What you decide to use underwater doesn't define who you are and one could argue that men should have the equal right to wear different gear if they wanted to. That being said, manufacturers have been working hard over the last decade in order to include equipment taking into account the natural morphological differences between men and women, and this is definitely a step in the right direction, regardless of the colour of the gear.

With male dominance at the forefront of the obstacles for women, female diver networks have since been established. Creating a platform for women to seek buddies pre-dive enables confidence to participate that goes beyond the scuba world. Cross-Participation has proven successful in attracting women into the sport, giving rise to underwater yoga which has recently created an underwater sensation.

Not only does diving provide interesting links to other sports, it has created opportunities in science and technology. Since the creation of WDD, the event slowly escalated towards a global movement of divers, regardless of gender, sharing their devotion to the ocean. As divers we add an important underwater

perspective, in comparison to non-divers, who do not witness the destruction of oceans first hand.

Amidst many other Marine Biologists (MBs), I found my interest in the underwater world through scuba diving. Following my Open Water course on a live-aboard with a team of MBs, I became obsessed with learning more, which led me to enrol in Marine Biology at university. Scuba diving is an effective tool to achieve scientific knowledge through a variety of methods, from Remotely Operated Vehicles to Underwater Archaeology.

The global education and skills forum acknowledged issues in gender imbalance within science and technology subjects, with a mission to ease barriers to girls into the scientific world. Aforementioned subjects are integral to childrens'' education, delivered in the correct manner such as outdoor education, they allow children to truly engage in the subject. Activities such as scuba diving act as influential vectors towards the realm of science. Therefore it's essential to manifest equality to children within these activities.

The world of Marine Sciences and consequently conservation has seen an increasing number of women participants. Anecdotally during my time at university, there were visibly more women than men enrolled in the course. Differing perspectives provided interesting solutions when tackling complex problems. In this respect it is essential to have the voices of both men and women. Inclusion of gender creates a diverse platform of differential knowledge. Our biggest achievements as human-kind has stemmed from our ability to cooperate together towards something we all believe in, take religion for example. Contradictorily our biggest catastrophes have risen from our large scale collaboration, take for example plastic pollution. Now it is our job to work together regardless of gender to rectify our mistakes.

Human-kind have a thirst for knowledge, yet not all have been given the opportunity to explore the answers. Through creativity and persistence, our predecessors paved the way for us women today. Historically, women have risked everything for science, often working under pseudonyms for their work to be taken seriously. It should no longer be a novelty for women to be included within science nor within diving.

Women are needed to help solve the oceans biggest problem: ignorance – SYLVIA EARLE

As a united team at Freestyle, men and women from across the globe came together on the 20th of July to work on a local problem: marine and coastal debris. Within 1.5 hours of a beach clean, a total of 112 kg of debris was cleared from a local beach in Dibba. I would like to take this time to thank everyone that attended this event at Freestyle Divers and reiterate the impact and influence to others you fabricated on this day.

EMIRATES NBD – BEATING MARINE WASTE – ONE DIVE AT A TIME!

BY **MICHELA COLELLA – DIVERS DOWN**

From the fast paced banking territory of Dubai to the bottom of Dubai Creek and the coastal waters of the Gulf, Emirates NBD Private Banking have been making a difference to the UAE's underwater environment.

In 2018, Emirates NBD Private Banking and the Group's Corporate Social Responsibility unit made a commitment to improve the quality of UAE waters by launching the 'Keep the Creek Clean' programme in partnership with Divers Down UAE. The mission – restore the waterways of this Middle Eastern gem to their former glory through conservation projects, clean-up operations and continued education and awareness through the importance of protecting our ocean!

Within its first year, the programme trained over 21 new Open Water divers and 11 qualified divers continued their diving education. Alongside this, a large section of this group have also gone on to take specialised dive conservation courses such as Dive Against Debris and Shark Awareness.

Through their continued efforts and passion to protect the invaluable underwater environment and by selflessly giving up their spare time, the volunteers of 'Keep the Creek Clean' have already cleared in excess of 5,400 kg of marine litter from the UAE's waterways. With a huge selection of waste from plastic bags, fishing equipment and industrial waste, there has been no clean-up too big or small for the committed team at Emirates NBD to tackle head on.

If these practical efforts were not enough, Emirates NBD has also made a financial commitment to give the programme additional steam, pledging a monetary contribution to 'Keep the Creek Clean' for every new Emirates NBD Private Banking customer. The waterways are an essential component of the way of life in the UAE, from the bustling dhow trade at Dubai Creek to the sustainable fishing economy or even for the continued enjoyment over and under the waves for generations to come. Through its commitment and contribution, Emirates NBD has taken a landmark step in the right direction to securing this future. The ripples of this programme are already being felt across the diving and corporate community and by inspiring more ambassadors to take up the cause, the UAE will benefit significantly from the collective impact of conservation efforts.

With this promising start, we hope to see more UAE companies and individuals take a stand against marine waste and participate in dive training and conservation education. Only by witnessing the underwater world first-hand can people truly understand and appreciate why it needs our help and protection. We can all play a part in protecting what we enjoy.

Emirates NBD Private Banking and Divers Down continue to lead the charge – why not come and join them?

www.diversdownuae.com

REC TO TEC – THE CROSS OVER TO THE DARK SIDE OF DIVING

BY **HANNAH BAKER – DIVERS DOWN**

How many times have you overheard other divers talking about amazing dives they have done and the incredible things they have seen, then, after capturing your interest, you find it's a little out of your depth range?

How many times have you wished you could spend just a little longer on that insane wreck, or with that Manta Ray who flew in for a visit, but you are limited by either your gas supply or your NDL?

For those of you who feel the constant itch to go that little bit further, take the next step and challenge yourself. We certainly have the solution for you.

Technical diving is the gateway to some of the most stunning diving the world has to offer, allowing you to visit places few have or ever will to see things many believe only exist in films.

Most divers have the preconception that this requires huge pre-requisites and that it is way beyond their reach, even those who have been in the game for many years. It is more accessible than you may think. The big decider should be that you are already a very comfortable and fairly experienced recreational diver, and you are prepared to do the extensive study and preparation required to be a competent and successful technical diver.

So what are the entry requirements?

- PADI Advanced Open Water or equivalent.
- PADI Enriched Air Diver or equivalent with a minimum of 10 logged EANx Dives.
- PADI Deep Diver with a minimum of 10 dives to a depth of at least 30 metres.
- 18 Years old.
- Minimum of 30 total logged dives.

Alongside the above, we would also generally recommend either a course or experience diving with Back-mount doubles or a Side-mount system as this is used throughout the TEC programme. However, the Side-mount and TEC Side-mount courses can be a great entry into the TEC pathway for those who are curious about the deeper and darker side of diving. These introduce the foundational motor and gas planning skills which are built on throughout TEC 40 through to Trimix and so act as a great first step for many people.

By working at Divers Down, I am lucky enough to have some great training sites well within reach for these programmes as well as offering great foundational options to peak your interest, in the forms of Side-Mount or Self-Reliant specialities with all the equipment available on site.

Within the UAE there are dive sites many are not aware of which are only accessible to the Technical diving community, for example over on the East Coast, the 'Ines' wreck sits at a depth of around 70 metres and is way out of recreational diving range. However, through the TEC pathway these are dives which are more than achievable once completing TEC Trimix training.

So why not come and explore new depths with Divers Down and take on a new challenge both educationally and physically, the learning curve you will experience will be like none other, the emotional and mental challenges will inevitably change your whole perspective on diving, and along the way you will open up a whole new array of dive sites to explore.

If what you've read doesn't convince you, then take a look at some comments from one of my most recent TEC students:

"The most valuable point I have taken away from the Technical courses is the flexibility it gives me in planning my dives, there are so many variables that I can now adjust to give me optimum bottom time or a more conservative profile. As a result I have already completed some awesome technical dives on wrecks that have been on my bucket list for years, and now I've had the opportunity to see so much more on each and get the most out of each dive.

The mindset change you go through with a technical course is amazing, the focus and discipline you have to approach each dive with is so important, but I believe it truly has made me a better diver all-round. The great feeling you get when a good technical dive plan comes together is hard to beat!"

Mark Bates – TEC 50 Diver + Divemaster

So if we have tickled your interest why not come and see for yourself.

www.diversdownuae.com

THE EEL AND CARP

STORY BY PATRICK VAN HOESERLANDE ILLUSTRATION PETER BOSTEELS

Another nice dive. In nice and warm water, at least with a diving suit on anyway. And good visibility. Skubba had seen a lot of fish.

When Skubba surfaced, he described all he had seen in great colour and detail. "I saw an eel swimming. That big," he said with his arms wide open.

"What did it look like?" asked Fred. Fred had never seen an eel in real life, only in pictures and occasionally on his plate in 'a green sauce or fried', but never one swimming in water.

Skubba explained the fish details to Fred, "It had small fins, a long and round body, and a small trunk".

"And how did the eel swim?" Fred asked curiously.

"A bit like a snake but underwater. The eel did not really swim, but snaked through the grass," said Skubba.

Fred found it all very exciting. He wrote everything down in his booklet.

"I've also seen a carp," Skubba said, his eyes blinking in excitement.

"A carp? What did it look like?" Fred wanted to know.

Skubba went on about its fins, tail, tarp, and its long and half-round body. But Fred couldn't picture the carp Skubba described.

"Draw it," he told Skubba.

They looked for a piece of soft soil and a stick. They smoothed the ground out a bit, and Skubba started to draw. He was not very good at drawing, except in drawing divers, but he did his best to sketch the fish as well as he possibly could.

It had a long body with fins on its back and belly. A fan-like tail. He had problems with the trunk itself, but in the end, he was satisfied with his drawing. The head looked a bit like a weird shoe.

After having a good look, he proudly said, "This is what it looked like. This is the fish I saw."

Fred briefly studied the drawing and replied, "But that's not a carp!"

"Yes, it is. I saw that fish!".

"I'm not saying you didn't see that fish, but that fish is not a carp."

"It is!"

"No, it is not."

"How do you know that this is not a carp?" asked Skubba.

"I have seen a picture of a carp and this does not look like it."

"What is it then?"

"I don't know."

"Then it's a carp," Skubba said firmly.

"Let's ask Nella. She will know," Fred suggested.

"Good idea. You will see that I am right."

"Nella! Nella!" they yelled together.

THE PIKE

STORY BY PATRICK VAN HOESERLANDE ILLUSTRATION PETER BOSTEELS

Both friends looked at the drawing Skubba had drawn in the sand. "Nella! Nella!" they yelled together. Nella couldn't possibly ignore them. She put her equipment aside for a moment and approached the boys.

They both pointed to the drawing Skubba had made in the sand.

"Nice drawing," said Nella on seeing the sketch.

"That is the fish we saw on our dive," Skubba told her.

After having a close look at it, she said, "That is indeed the fish we have seen!"

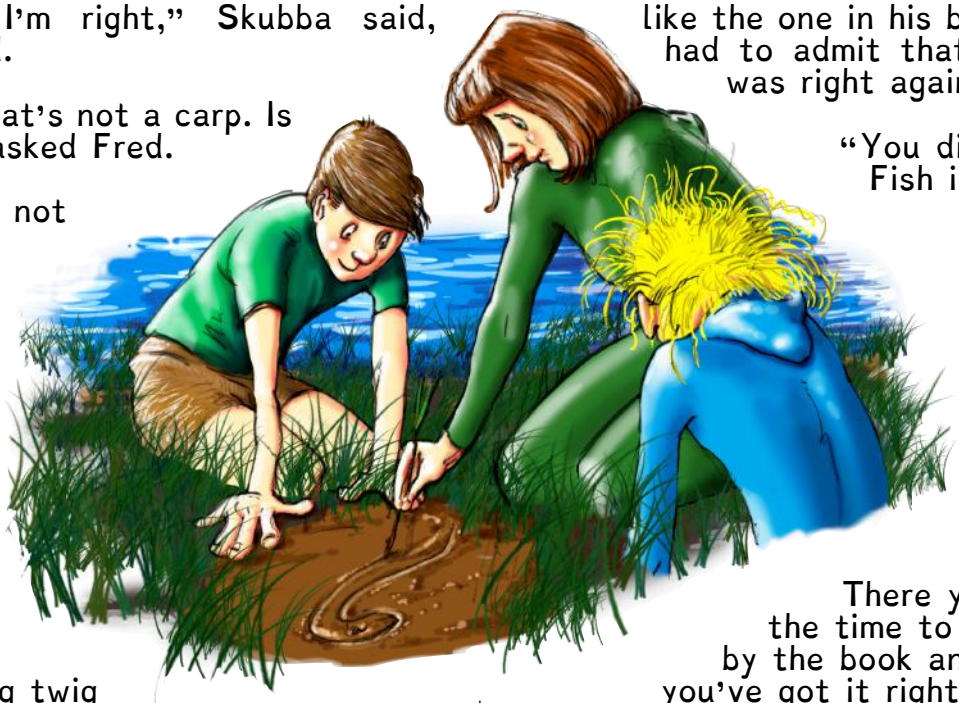
"You see, I'm right," Skubba said, pushing Fred.

"Yes, but that's not a carp. Is it, Nella?" asked Fred.

"No, that is not a carp," she answered. Now Fred poked Skubba.

"An eel?" tried Skubba.

"No, not an eel either." Nella took the sketching twig from Skubba and began to draw another fish in the sand.



"Voila, that is what an eel looks like," she explained. "An eel looks a bit like a fish with the body of a snake. It has a small head, and a long body with a tail fin. It swims along the bottom".

Both boys looked at the drawing and nodded in agreement with Nella's explanation.

"The fish in Skubba's drawing does not have these characteristics. His snout resembles a shoe. Do you see that?"

"Yes," they answered in unison.

"Its body is thicker and shorter than that of an eel, and its fins are bigger," she further explains, indicating the differences between the drawings.

"The fish we saw, is a..."

"PIKE!" exclaimed Fred.

"Right, Fred. How did you know?" Nella asked while Skubba stared at him.

"If I look at its dorsal fin, tail and head, and I compare this with the drawings in my book, it looks a lot like a pike," Fred explained pointing to the large drawing. The fish in the sand was indeed like the one in his book, Skubba had to admit that. His friend was right again.

"You did well Fred. Fish identification is not easy. Even with a book," she explained.

"A good place to learn to identify fish is at an aquarium. There you will have the time to identify fish by the book and make sure you've got it right by checking it with the information panel of the aquarium."

"Wait," she said. She walked to her car and returned with a large plastic card.

"This is a Fish ID card that you can take underwater on your dives to recognise fish in your local area. See? Here is the eel and here is the pike."

Fred took the card and together with Skubba, they looked for the pike.

"Can I take this with me on my next dive?" asked Skubba.

REEF CHECK'S BID FOR THE OCEANS KICKS OFF IN SEPTEMBER

Mark your calendars! Reef Check's online auction fundraiser, "Bid for the Oceans", will happen September 16-26, 2019. From dive trips, beach resort stays, unique experiences and cool gear, there will be something for everyone. When you bid on exclusive and exciting deals you will be supporting Reef Check's work around the world.

Sign in as early as September 9 to peruse the offers!

Reef Check Foundation is a non-profit organisation that works to protect our oceans through conservation, research and education.

Every year, Reef Check trains hundreds of volunteer SCUBA divers to become citizen scientists to monitor tropical coral reefs, California rocky reefs, and Mediterranean reefs. The data collected is freely available to anyone, and is used worldwide to improve the health and protection of our oceans. Reef Check empowers people everywhere to take care of our reefs and oceans. Reef Check's network spans 90 countries and territories, with more than 7,000 EcoDivers who have completed over 10,000 surveys since 1997, creating the largest and longest running database on coral reef health on the planet.

Join us with Bid for the Oceans, and help Reef Check protect our seas!

Bid for the Oceans: https://bit.ly/2OvYLuV

A BIG WELCOME TO THE NEWEST ECODIVERS AND TRAINERS ON THE BIG ISLAND OF HAWAII

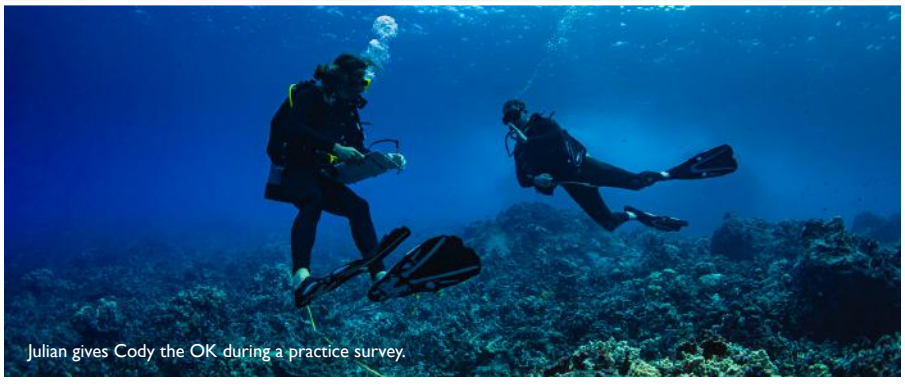
UNDERWATER PHOTOGRAPHY **SARAH LEE**

Aloha! After almost a 10 year dormancy in Hawaii, Reef Check is very happy to welcome the newest Trainers, as well as EcoDivers, on the Big Island.

Reef Check Foundation's Dania Trespalacios and Jan Freiwald teamed up with Reef Check Malaysia's Julian Hyde to conduct two Reef Check Trainings and to mentor the new teams as they begin to develop monitoring and education programmes and to collaborate with local management authorities.


New Trainers, Tara, Nick, Heather and Paul.


Olivia and Manny show off their new slates and prepare for a survey.


Julian gives Cody the OK during a practice survey.

Four EcoDivers from the Coral Reef Education Institute successfully completed their Training of Trainers: Heather Howard, Paul Badgley, Tara Brooks and Nick Pacheco. Trained as EcoDivers by Gregor Hodgson in October of last year, these newly minted Trainers worked very hard to complete their required surveys in time for the Training, and had many good suggestions to improve future Trainings and Training Materials. Six divers from Aquatic Life Divers successfully completed the EcoDiver Course: Neil Forsberg, Bayli Payne, Manny Katz, Cody Roth, Zain Hicks and Olivia O'Neil. Both teams from the Big Island have big plans to contribute to Hawaii's coral reef monitoring and management efforts, and to play a significant role in diver education and community outreach. In particular, the Coral Reef Education Institute plans to collect data to support Hawaii's 30 by 30 initiative, which is committed to effectively manage 30% of Hawaii's nearshore ocean waters by 2030.

Congratulations to our Reef Check teams in Hawaii! Mahalo!

COLOMBIA'S CORALES DE PAZ COMPLETES FIRST SURVEY OF PROVIDENCIA

BY **CORALES DE PAZ**

Corales de Paz began its survey year with an expedition to Providencia in the Insular Region of Colombia in the Caribbean, marking the first trip to the island since the relaunch of Reef Check Colombia in 2017. This unique island still conserves its natural wealth, guarded carefully by its citizens, since they depend on activities related to eco-tourism, scuba diving, and native cultural activities. Providencia is famous among underwater enthusiasts for the presence of reef sharks and for the tolerance and respect that locals give to these animals, understanding that they are much more valuable and attractive when they are alive and protected. Corales de Paz plans to survey these sites during the first quarter of every year, to monitor the condition of the coral community at the end of the dry season in the Caribbean, in one of the paradises for diving and nature tourism in Colombia and a benchmark for conservation and sustainability for the world.

A team of 11 Reef Check EcoDivers, two scientific leaders from Corales de Paz and two dive leaders surveyed four of the most frequented dive sites on the island: Mantas, Tetes, Bajo de San Felipe and Loro Town. In general, the monitoring results show that the abundance of parrotfish (Scaridae) and surgeonfish (Acanthuridae) were similar at all sites; these are herbivorous fish that control macroalgae. The abundance of grunts or margates (Haemulidae) was also similar at all the monitored sites. There was a greater abundance of groupers (carnivorous fish of the Serranidae family) of more than 30 cm in length when compared to other sites monitored by the Reef Check Colombia programme since 2017, such as San Andres Island and Santa Marta. Groupers are commercially important and show the wealth of usable resources still preserved for the people of the island.

Nutrient indicator algae coverage was estimated at 12%, lower than the average reported for San Andres in October 2018, estimated at 20%. Live coral cover was estimated at 18%, which is above the average reported for Caribbean coral reefs (16.8%, Jackson et al 2014 Status and Trends of Caribbean Coral Reefs). It is pleasing to report that the percentage of coral bleaching observed was less than 1% of the population.

It is important to note the absence of trash and physical impacts on the reef. This has been achieved thanks to the intervention of local environmental authorities in deploying anchor buoys for the dive sites, and thanks also to the people of the island for managing their garbage and waste.

Thanks to the participation of the most committed Reef Check EcoDivers, this expedition allowed Reef Check Colombia to carry out the first assessment of the health and condition of the reefs on Providencia with a group of citizen scientists. Thanks to the unconditional support of the inn Nativa Barracudas Camp and the dive centre, Entre Mares Providencia that made this event possible.

JOIN REEF CHECK MALAYSIA

FOR INTERNATIONAL COASTAL CLEAN-UP DAY IN SEPTEMBER

BY **REEF CHECK MALAYSIA**

Reef Check Malaysia (RCM), together with Yinson Holdings Bhd as the main sponsor and Coca-Cola as our strategic partner, are organising a nationwide beach clean-up on Saturday, September 21, 2019, in conjunction with the International Coastal Clean-up (ICC) Day. Several partners and friends, from individuals to companies, have already agreed to lead beach clean-ups in their own areas. This effort is part of our long battle against marine debris and plastic waste in Malaysia.

In previous years, RCM has conducted clean-ups and programmes in conjunction with ICC on Tioman and Mantanani Islands, but on a much smaller scale. Then in 2018, we organised two beach clean-up events, as part of the International Year of the Reef 2018. We conducted a small-scale beach clean-up in March, and a bigger one in September for the ICC 2018.

The clean-up in September involved numerous partners across all of Malaysia's states, and saw a huge volunteer turnout of 4,018 people in 84 locations. Some of our star-studded cast included Tengku Zatashah from Selangor, YB Yeo Bee Yin, Minister of MESTECC, H.E. Victoria Treadell, British High Commissioner, Reef Check Malaysia Ambassadors Baki Zainal and Wayne Thong Wai Yean – and celebrities galore. More than 7,500 kg of trash was removed during the clean-up, with the most common items being plastic bottles (30,248), cigarette butts (20,299), and plastic grocery bags (12,055).

These clean-up efforts are intended to raise awareness and bring attention to the problem of marine debris, specifically plastic waste, which represents a serious threat to marine ecosystems and human health. RCM has been working and collaborating with several partners from industry, such as Coca-Cola, and government to find solutions to reduce trash on our beaches. As part of our plastic waste campaign, we've had workshops with plastic manufacturers and suppliers, government, waste management companies and recycling companies, as well as plastic specialists Plasticity.

To continue our efforts this year, we will be initiating a recycling collection project in a pilot housing area to investigate the challenges to domestic separation at the source in Kuala Lumpur and to increase the rate of recycling. On Pulau Mantanani in Sabah we have installed a machine to reprocess plastic waste, turning a waste stream into products for sale to tourists. We hope to extend the successful recycling programme to new areas in Pulau Tioman.

We are currently recruiting partners and volunteers across the country who are interested in joining us on September 21st. If you want to organise a team of volunteers (friends, family, colleagues) for a few hours on that day, please email us at **cleanup@reefcheck.org.my** and we will send you more information on how to organise a beach clean-up and collect data to help us identify long-term solutions for trash-free seas. Please join our Facebook group for this event to receive the latest updates.

FIVE YEARS: A REFLECTION AT ERIC

BY **ENVIRONMENTAL RESEARCH INSTITUTE CHARLOTTEVILLE (ERIC)**

When the Environmental Research Institute Charlotteville (ERIC) began operations in 2014 in the small fishing village of Charlotteville, Tobago, there was no telling where it would be five years later. The alignment of several opportunities, including the prospect of operating a dive shop, the establishment of a base of operations and the proposal for a marine protected area (MPA) in north east Tobago, provided a solid ground for the organisation.

There was a simple vision – "sustainability for the people and ecosystems of northeast Tobago". To begin achieving this, a small contingent of representatives from various community-based organisations were trained in marine ecology and various monitoring programmes, one of which is the Reef Check method, with training from Nikole Heath of Force-E and Reef Check Florida. The individuals have since become important stalwarts in ERIC as Community-based Field Technicians. They play a vital role by assisting with data collection and advocacy activities. Their participation make them important communicators within their various communities, sharing their experiences and observations in order to highlight the need for management of their natural resources and by extension, conservation of the critical ecosystems bordering their villages. With their aid, 12 Reef Check sites around northeast Tobago were established and annually monitored. There is hope to set up at least two more in the coming months.

Shortly thereafter, ERIC has been rapidly propelled into several other projects and programmes centred around citizen-science-based research and monitoring, capacity building, policy development, and sustainable tourism. Some of the programmes include working with Global FinPrint, an international collaboration of scientists, research and civil groups, seeking to assess the status of sharks and rays globally. The data looks promising for Tobago, despite the heavy fishing pressures on its shark populations. Combined with significant interest from the governing fisheries department in the Tobago House of Assembly, there is some promise in the future towards regulating shark captures in Tobago's waters.

Significantly diminished staghorn coral (*Acropora cervicornis*) populations in northeast Tobago spurred an initiative to establish coral nurseries. Despite a number of trials and setbacks, it was a proud moment for ERIC when the first batch of staghorns were outplanted in 2018, happily coinciding with International Year of the Reef.

Even though ERIC is primarily comprised of marine and aquatic biologists, a bold move was taken to step out of the water, a comfort zone, to venture into the terrestrial environment. With a few prominent tour guides of Tobago's Main Ridge Forest Reserve (MRFR), a simple monitoring checklist was devised of behavioural cues of indicator plants and animals, which can be observed and documented with clients during their tour. Over time, the data will detect shifts in behavioural patterns which can hopefully trigger an early response towards forest management.

For the past two years, ERIC took up another challenge of producing maps of environmental threats and natural resource usage within the marine nearshore environment, villages and roads in northeast Tobago. This visual aid will provide a comprehensive spatial overview of how the threats and usages interact with the borders of the MRFR and the proposed MPA.

On a stronger advocacy front, Northeast Tobago Climate Change Champions Network was created, comprising of a number of community representatives driving the climate change conversation among peers and fellow villagers. Very soon the group will get their hands dirty with a coastal tree planting exercise, to increase coastline stability.

As a result of all of this hands-on work, ERIC uses its experiences from research and monitoring, and community engagement to actively participate in various national policy consultations, representing civil society. One of its major undertakings on this front is the push to apply for UNESCO Man and the Biosphere designation for northeast Tobago.

Fortuitously, all this work has not gone unrewarded. ERIC has been a recipient of the prestigious National Energy Globe Award for two successive years for the Forest Check and Climate Change Champions programmes. Other various awards and recognition for NGO excellence and tourism were also bestowed.

Like many non-profit NGOs, the biggest challenge is obtaining funding to maintain operations. Many of the projects would not have been possible without different funders. To supplement, ERIC has been fortunate to attract the attention of diverse divers, students, colleges and universities interested in science-tourism and ecological expeditions. Indeed, over time, the organisation witnessed a rapid growth in its personnel capacity and expertise, work and respect as a voice in northeast Tobago. The journey to where ERIC is today definitely did not come easily, but it will always be remembered that its success began with Reef Check five years ago.

FEATURE CREATURE

SHORTFIN MAKO (*ISURUS OXYRINCHUS*)

FEATURE **IUCN RED LIST 2019** PHOTOGRAPHY **ANDY MURCH – BIG FISH EXPEDITIONS**

RED LIST CATEGORY & CRITERIA: ENDANGERED
Scientific Name: *Isurus oxyrinchus*
Taxon Name: *Isurus oxyrinchus* Rafinesque, 1810
Common Name: English: Shortfin Mako

Regional Assessments:
- Europe
- Mediterranean

Infra-specific Taxa Assessed:
- *Isurus oxyrinchus* (Atlantic subpopulation)
- *Isurus oxyrinchus* (Eastern North Pacific subpopulation)
- *Isurus oxyrinchus* (Indo-west Pacific subpopulation)

ASSESSMENT INFORMATION

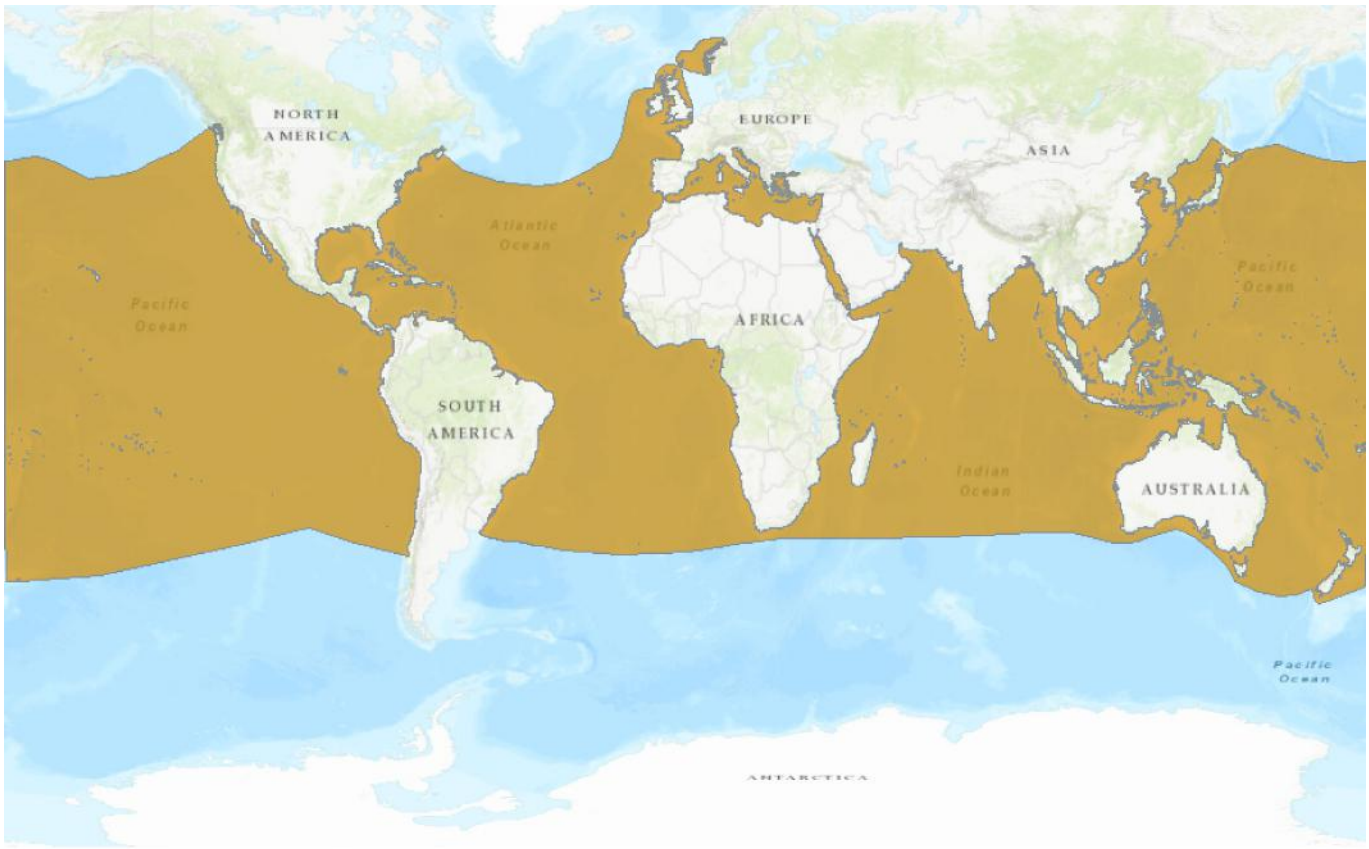
Justification: The Shortfin Mako (*Isurus oxyrinchus*) is a large (to 445 cm total length) pelagic shark, widespread in temperate and tropical oceans to depths of 888 m. The species has low biological productivity with a triennial reproductive cycle and late age at maturity. It is caught globally as target and by-catch in coastal and pelagic commercial and small-scale longline, purse seine, and gillnet fisheries, and is generally retained for the high-value meat as well as its fins. Steep population declines have occurred in the north and south Atlantic, with declines also evident, though not as steep in the north Pacific and Indian Oceans. The south Pacific population appears to be increasing but with fluctuating catch rates. The weighted global population trend estimated a median decline of 46.6%, with the highest probability of 50-79% reduction over three generation lengths (72-75 years), and therefore the Shortfin Mako is assessed as Endangered A2bd.

Previously Published Red List Assessments:
2009 – Vulnerable (VU)
2000 – Lower Risk/near threatened (LR/nt)

GEOGRAPHIC RANGE

Range Description: The Shortfin Mako (*Isurus oxyrinchus*) is widespread in temperate and tropical waters of all oceans (Ebert et al. 2013).

Country Occurrence: Native: Albania; Algeria; American Samoa; Angola; Anguilla; Antigua and Barbuda; Argentina; Aruba; Australia; Bahamas; Bangladesh; Barbados; Belize; Benin; Bermuda; Bonaire, Sint Eustatius and Saba; Brazil; Brunei Darussalam; Cabo Verde; Cambodia; Cameroon; Canada; Cayman Islands; Chile (Easter Is.); China; Christmas Island; Cocos (Keeling) Islands; Colombia; Congo; Cook Islands; Costa Rica; Côte d'Ivoire; Croatia; Cuba; Curaçao; Cyprus; Dominica; Dominican Republic; Ecuador (Ecuador (mainland), Galápagos); Egypt; El Salvador; Equatorial Guinea (Annobón, Equatorial Guinea (mainland)); Eritrea; Fiji; France (Clipperton I., France (mainland)); French Guiana; French Polynesia; Gabon; Gambia; Ghana; Gibraltar; Greece; Grenada; Guadeloupe; Guam; Guatemala; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; India (Andaman Is., Nicobar Is.); Indonesia; Iran, Islamic Republic of; Ireland; Israel; Italy; Jamaica; Japan; Kenya; Kiribati; Korea, Democratic People's Republic of; Korea, Republic of; Liberia; Libya; Macao; Madagascar; Malaysia; Maldives; Malta; Marshall Islands; Martinique; Mauritania; Mauritius; Mexico; Micronesia, Federated States of ; Montenegro; Montserrat; Morocco; Mozambique; Myanmar; Namibia; Nauru; New Caledonia; New Zealand; Nicaragua; Nigeria; Niue; Norfolk Island; Northern Mariana Islands; Norway; Oman; Pakistan; Palau; Panama; Papua New Guinea; Peru; Philippines; Pitcairn; Portugal (Azores, Madeira, Portugal (mainland), Selvagens); Puerto Rico (Navassa I., Puerto Rico (main island)); Réunion; Russian Federation; Saint



Barthélemy; Saint Helena, Ascension and Tristan da Cunha; Saint Kitts and Nevis; Saint Lucia; Saint Martin (French part); Saint Vincent and the Grenadines; Samoa; Sao Tome and Principe; Saudi Arabia; Senegal; Seychelles; Sierra Leone; Singapore; Sint Maarten (Dutch part); Solomon Islands; Somalia; South Africa; Spain (Canary Is., Spain (mainland), Spanish North African Territories); Sri Lanka; Sudan; Suriname; Taiwan, Province of China; Tanzania, United Republic of; Thailand; Timor-Leste; Tokelau; Tonga; Trinidad and Tobago; Tunisia; Turkey; Turks and Caicos Islands; Tuvalu; United Kingdom; United States (Aleutian Is., Hawaiian Is.); United States Minor Outlying Islands (Howland-Baker Is., Johnston I., Midway Is., US Line Is., Wake Is.); Uruguay; Vanuatu; Venezuela, Bolivarian Republic of (Venezuela (mainland), Venezuelan Antilles); Viet Nam; Virgin Islands, British; Virgin Islands, U.S.; Wallis and Futuna; Western Sahara; Yemen.

FAO Marine Fishing Areas: Native: Atlantic - northwest, Atlantic - southeast, Atlantic - southwest, Atlantic - eastern central, Atlantic - northeast, Atlantic - western central, Indian Ocean - eastern, Indian Ocean - western, Mediterranean and Black Sea, Pacific - northeast, Pacific - southwest, Pacific - western central, Pacific - southeast, Pacific - eastern central, Pacific - northwest.

POPULATION

There is no data available on the absolute global population size of the Shortfin Mako. Genetic results indicate one global population, however there is some genetic structuring between ocean basins (Schrey and Heist 2003, Taguchi et al. 2015, Corrigan et al. 2018).

Population trend data is available from four sources: (1) stock assessments in the north Atlantic and south Atlantic (ICCAT 2017); (2) stock assessment in the north Pacific (ISC 2018); (3) standardised catch-per-unit-effort (CPUE) in the south Pacific (Francis et al. 2014); and (4) a preliminary stock assessment in the Indian Ocean (Brunel et al. 2018). The trend data from each source were analysed over three generation lengths using a Bayesian state-space framework (a modification of Winker et al. 2018). This analysis yields an annual rate of change, a median change over three generation lengths, and the probability of the most likely IUCN Red List category percent change over three generations.
First, while the previous north Atlantic stock assessment suggested low probability of overfishing and that stocks were healthy (ICCAT 2012), the most recent north Atlantic stock assessment revealed that the stock was both overfished and that overfishing was occurring (ICCAT 2017). The south Atlantic stock assessment biomass estimates were deemed unreliable by the stock assessors, although they inferred that fishing mortality is likely unsustainable (ICCAT 2017). This concern is corroborated by a recent analysis of standardised catch rates of Shortfin Mako on longlines in the south Atlantic that revealed steep declines of 99% in the average CPUE of 1979–1997 and 1998–2007 (Barreto et al. 2016a). As a result of the unreliable stock assessment, the north Atlantic stock assessment was considered as representative of the south Atlantic for the trend analysis. The trend analysis of the north Atlantic modelled biomass for 1950-2017 (68 years) revealed annual rates of decline of 1.2%, consistent with an estimated median decline of 60.0% over three generation lengths (75 years), with the highest probability of 50-79% reduction over three generation lengths.

Second, the north Pacific stock assessment revealed that the stock was likely not overfished and that overfishing was likely not

occurring (ISC 2018). The trend analysis of the modelled spawning abundance for 1975-2016 (42 years) revealed annual rates of decline of 0.6%, consistent with a median decline of 36.5% over three generation lengths (72 years), with the highest probability of 30-49% reduction over three generation lengths. Although the stock assessment used a long data time series of 40 years, the trend analysis considered the population change over a longer period of 72 years, which results in a greater decline than that of the stock assessment.

Third, the New Zealand longline observer Shortfin Mako standardised CPUE for 1995–2013 (19 years) (Francis et al. 2014) was used to represent the catches in that region as it is observer data with good coverage, comes from the part of the region with highest catch rates, and Shortfin Mako move between New Zealand waters and areas further north. The trend analysis indicated annual rates of increase of 0.5%, consistent with a median increase of 35.2% over three generation lengths (72 years), with the highest probability of an increasing population over three generation lengths.

Fourth, the Indian Ocean preliminary stock assessment indicated that the Shortfin Mako stock is not currently overfished but subject to overfishing, however the biomass trajectories trend towards overfished with overfishing status (Brunel et al. 2018). The trend analysis of the biomass for 1971–2015.

(45 years) revealed annual rates of decline of 0.9%, consistent with a median decline of 47.9% over three generation lengths (72 years), with the highest probability of 30-49% reduction over three generation lengths.

Further to the above data and trend analyses, steep declines have occurred in the Mediterranean Sea; Ferretti et al. (2008) compiled nine time series of abundance indices from commercial and recreational fishery landings, scientific surveys, and sighting records, to reconstruct long-term population trends of large sharks in the northwestern Mediterranean Sea. Shortfin Mako and Porbeagle (*Lamna nasus*) showed an average instantaneous rate of decline in abundance of -0.12 (time range 135 years) and biomass of -0.15 (time range 106 years), which equates to an estimated decline of 99.9% in abundance and biomass since the early 19th century (Ferreti et al. 2008).

Across the regions, the Shortfin Mako was estimated to be declining in all oceans, other than the south Pacific where it is increasing. To estimate a global population trend, the estimated three generation population trends for each region were weighted according to the relative size of each region. The overall estimated median reduction was 46.6%, with the highest probability of 50-79% reduction over three generation lengths (72-75 years), and therefore the species is assessed as Endangered A2.

Current Population Trend: Decreasing

HABITAT AND ECOLOGY

The Shortfin Mako is a neritic and oceanic, epipelagic and mesopelagic species, found worldwide in tropical and warm-temperate seas to depths of 888 m (Abascal et al. 2011, Ebert et al. 2013, Weigmann 2016). The species reaches a maximum size of about 445 cm total length (TL) (Weigmann 2016). Males mature at 166-204 cm TL and females at 265-312 cm TL (Pratt and Casey 1983, Stevens 1983, Cliff et al. 1990, Francis and Duffy 2005, Varghese et al. 2017). Reproduction is viviparous and oophagous with an estimated gestation period of 15-18 months and a three-year reproductive cycle (Mollet and Cailliet 2002). Litter size is 4-25 pups (possibly up to 30, mostly 10-18) with a size at birth of 60-70 cm TL (Garrick 1967, Compagno 2001). Female age at maturity varies from 18-21 years and maximum age from 28-32 years in New Zealand, the Southwest Pacific, Southwest Atlantic, and Northwest Atlantic Oceans; generation length is therefore 24-25 years (Bishop et al. 2006, Natanson et al. 2006, Wells et al. 2013, Doño et al. 2014, Barreto et al. 2016b).

Systems: Marine

USE AND TRADE

This is one of the most valuable shark species due to its high-quality meat. The meat is utilised fresh, frozen, smoked, and dried-salted for human consumption. The fins of the Shortfin Mako are commonly traded, comprising 1.2% of the fin imported in Hong Kong in 2014 (Fields et al. 2017). The liver oil, jaws, and skin are also used (Compagno 2001).

THREATS

The Shortfin Mako is caught globally as target and by-catch in pelagic commercial and small-scale longline, purse seine, and gillnet fisheries. The majority of the catch is taken as by-catch of industrial pelagic fleets in offshore and high-seas waters (Camhi et al. 2008). It is also captured in coastal longlines, gillnets, trammel nets, and sometimes trawls, particularly in areas with narrow continental shelves (Camhi et al. 2008, Martínez-Ortiz et al. 2015).

The species is generally retained for the meat and fins (Clarke et al. 2006a, Clarke et al. 2006b, Dent and Clarke 2015, Fields et al. 2017), unless regulations prohibit retention. Under-reporting of catches is likely in pelagic and domestic fisheries (Dent and Clarke 2015, Campana et al. 2016a). The species is highly valued by big-game recreational fishers, and although many practice catch and release, recreational fishing could be a threat due to post-release mortality, although such mortality is reported at 10% for recreational fishing (Camhi et al. 2008, French et al. 2015). Commercial post-release mortality has been reported as 30-33% for the Shortfin Mako on longlines (Campana et al. 2016b). The species is taken in beach protection programmes that target large sharks (Dudley and Simpfendorfer 2006, Simpfendorfer et al. 2010, Reid et al. 2011).

CONSERVATION ACTIONS

The success of actions agreed through international wildlife and fisheries treaties depends on implementation at the domestic level; for sharks, such follow up actions have to date been seriously lacking. In 2008, the Shortfin Mako was listed on Appendix II of the Convention on Migratory Species (CMS), which reflects Parties' commitments to work regionally toward conservation. The species is also covered by the CMS Memorandum of Understanding for Migratory Sharks, which is aimed at facilitating conservation. In 2018, Mexico announced its intention to propose adding the Shortfin Mako to Appendix II of the Convention on International Trade in Endangered Species (CITES). If the proposal is adopted at the 2019 CITES Conference, Shortfin Mako exports from CITES Parties would need to be accompanied by permits based on findings that parts are sourced from legal and sustainable fisheries.

Globally, there are very few limits on Shortfin Mako catch. In 2012, the General Fisheries Commission for the Mediterranean (GFCM) banned retention and mandated careful release for the Shortfin Mako and 23 other elasmobranch species listed on the Barcelona Convention Annex II. Implementation by GFCM Parties, however, has been very slow. Whereas the European Union implemented this measure through domestic regulations, it has yet to limit Shortfin Mako catch from anywhere else, even as Spain is consistently the world's top Shortfin Mako fishing nation. A 2017 measure agreed by the International Commission for the Conservation of Atlantic Tunas (ICCAT) – in response to scientific advice to ban retention of overfished north Atlantic Shortfin Makos – instead aims to maximise live release by narrowing the conditions under which Shortfin Makos from this population can be landed.

To allow recovery, it is recommended Shortfin Mako landings be prohibited as long as the global population is classified as Endangered. Short of that, improved reporting of catch and discard data, regional and national limits on Shortfin Mako catch based on scientific advice and/or the precautionary approach, and promotion of safe release protocols are urgently needed, as is full implementation of additional commitments agreed through international treaties.

CITATION

Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. *Isurus oxyrinchus*. The IUCN Red List of Threatened Species 2019. **www.iucnredlist.org**

MY BUDDY
THE INDOOR DIVER

FEATURE **PATRICK VAN HOESERLANDE** PHOTOGRAPHY **WERNER GRAF**

Diving in the indoor dive centre at TODI – The Ultimate Diving Experience is fun once or twice a season, but could more be too much?

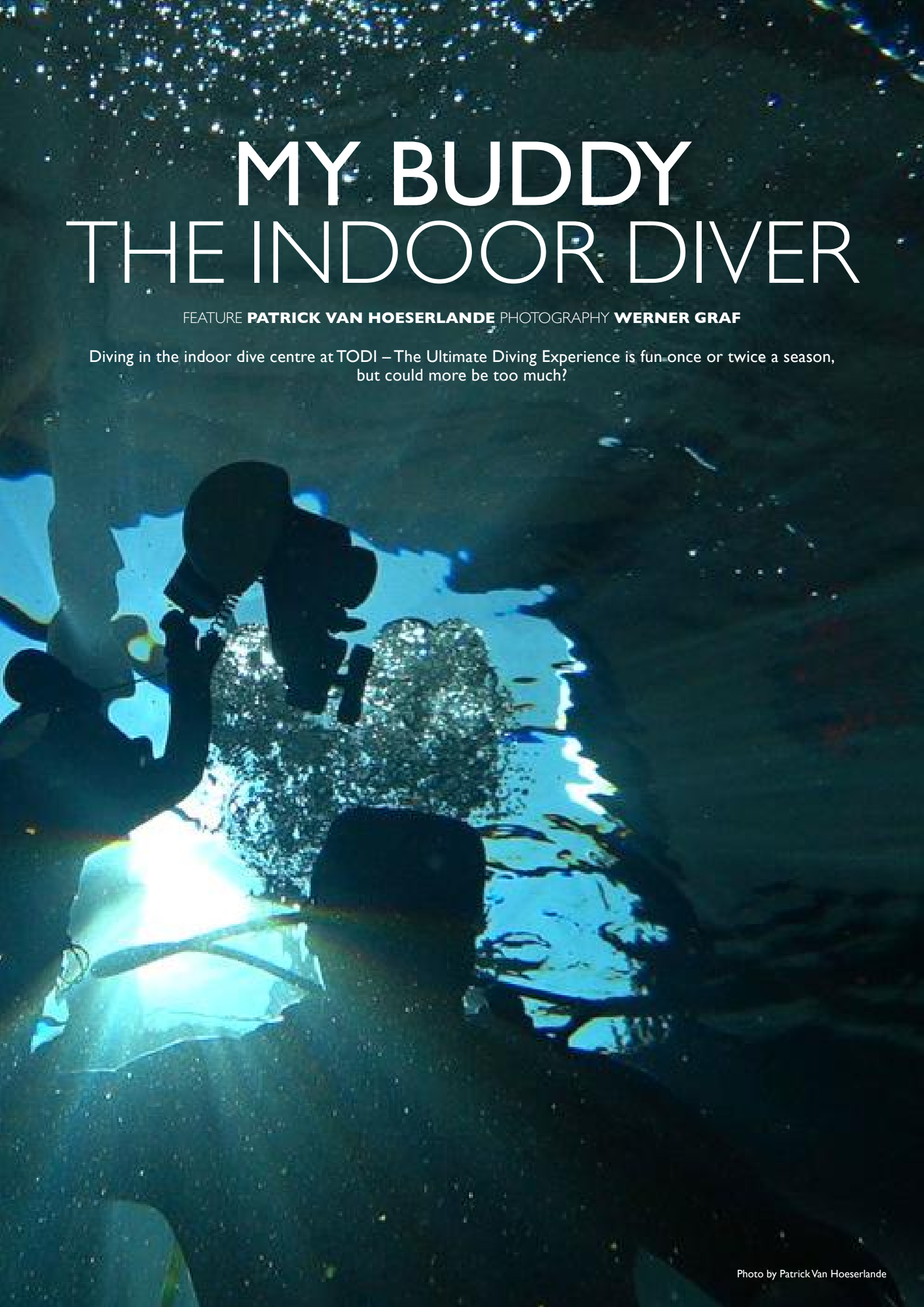


Photo by Patrick Van Hoeserlande





Diving in the indoor dive centre at TODI – The Ultimate Diving Experience is fun once or twice a season, but could more be too much? These are the thoughts amongst a number of divers, and I have to admit that I am one of them. Werner Graf is not a follower of this diving philosophy, on the contrary he will argue against it. If there were a specialisation certificate for indoor diving, he would immediately earn it. To get a better understanding of the attraction of diving in a large aquarium, I meet up with Werner on a very early morning to go and dive inside the dive tank of the old coal mine of Beringen, in Belgium.

With more than twenty dives in TODI, while the repurposed waste tank has barely been open a year to the public, Werner has become a familiar and welcomed guest diver. He knows the smallest details of the reservoir and its inhabitants. In my opinion, it's a rather boring form of diving, but when I think more of it, one can also say the same about diving over 100 times in the lake of Ekeren. Anyhow, my first question for Werner will be to know the reasons why he visits Beringen so often.

Before we enter the changing rooms, I fire my question at him. His answer is quite simple. He wants to perfect himself as a novice underwater photographer in taking 'portrait photos' of fish. The love for photographing animals flows through the family veins. His father also went hiking into nature to photograph fauna, but that was above the water. The quasi-perfect conditions of clear water, no current, and a sand free bottom, allow Werner to concentrate solely on the animal to photograph. There is also no shortage of models volunteering to pose in front of the lens. Missing an opportunity is not a disaster, after a while another opportunity simply presents itself again. There is no stress, like every dive should be. Why make it hard for yourself with all the distractions, when there is an easier path to improvement? Certainly if you want to master the technique of fish portraits.

Of course, there are other advantages to diving in TODI too. You always have a warm place to change and a hot shower at your disposal. You also do not have to drag heavy equipment to your dive site and the water is always pleasantly warm. Getting into the water is stress free and easy and it never rains. The weather under a roof is always nice and the pleasure of diving does not depend on the meteorological conditions. Admittedly, driving the long route to the centre in bad weather is not relaxing, but you know you are heading to a dry and warm dive site. After a nice dive, you don't have to drive on further to look for a place to get a bite to eat and drink, because these facilities are right next door to the changing rooms. Diving thus becomes a "TOtal DIve experience".

Time to test the 24°C warm water with my buddy. It is no coincidence that the water is that temperature. Most fish are warm water species and thus the water must be warm. However, above 24°C, it is obligatory to use chemicals for public health reasons, and neither fish nor divers are fans of those. The compromise consists of a water temperature just below this limit. A compromise all users find comfortable.

Armed with a camera, an underwater housing and a diving box on wheels, my buddy steps into the elevator. I roll out my underwater video camera and diving equipment. We get our tanks, BCDs and weights, and prepare everything to the side. There is not a lot of people, but we had picked the early hours just for that reason. A short briefing and there we go.

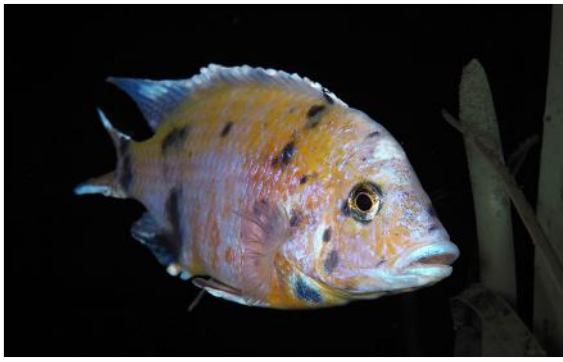
Before we enter the water, my buddy points to a silver Arowana (I have to confess that I looked it up) and tells me that this species is difficult to photograph. They tend to swim away when you get close. While my buddy is checking the seals of his camera, I am testing the shyness of an Arowana. I come within a metre of it and the fish does not move a fin. I have encountered more timid fish.

When Werner asks if everything is OK, I know that from now on I will not get much attention as a buddy. After all, if an underwater photographer has spotted his prey, he or she will completely focus on their subject. Indeed, this beginner is no exception. Cautiously he approaches his victim to the point where his lens almost touches it. Now I understand why the Arowana thinks he – or is it a she – is entering his personal zone. The distance between diver and fish is not expressed in metres, but in centimetres.

We progress very slowly. Werner tries to take







a portrait picture of every fish he encounters. He is a hardcore adaptor of the rules you find posted on a photo booth: look straight into the camera, both eyes open… He wants to capture the soul of the fish and when you see the result, he is not far from his goal. In addition, he does not wish to edit any of his photos. If a picture has to be perfect, it must be taken that way underwater. Electronic make-up is not his way.

I enjoy this quiet and slow dive. My photos do not have to be close-ups, because I want to capture both the photographer and his models. The only problem is that my time for this depends entirely on the two main players. If one of the two thinks it has lasted long enough, I have to start over. Fortunately, the local residents and their visitors are quite docile.

Like every good dive, we have to break it off early. The limited air in our tanks forces us to surface. Totally relaxed, we disassemble the equipment and stow it away. After a chat with a hot cup of coffee, we go off to get warm showers before meeting up again to log our dive.

Nice, warm water, perfect weather, fantastic visibility and plenty of fish. What more can you expect from a dive? Thanks for being my buddy Werner, and sharing the thousands of fish in TODI with me. I leave Beringen and check off another item on my list of possible diving activities within our organisation.

Where will I dive next time? Curious? Me too.



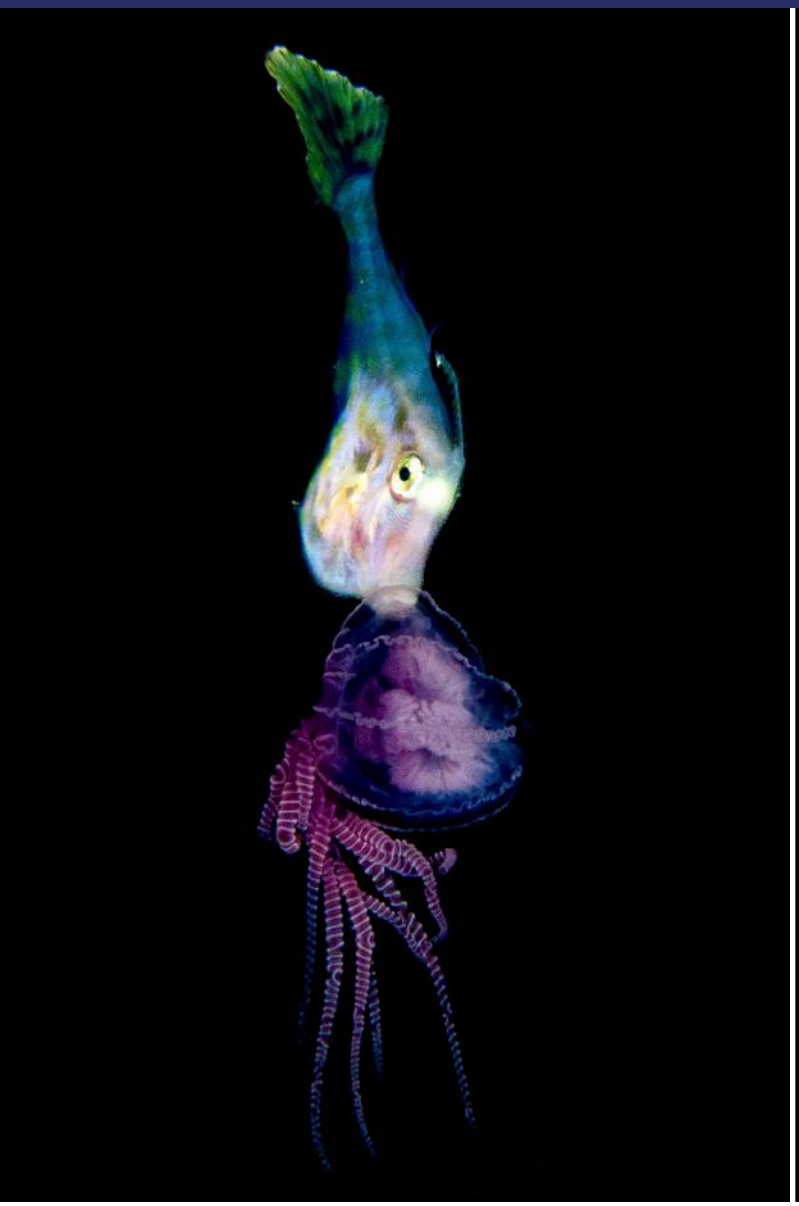

Do you know someone with a unique dive activity that would have me as his or her buddy? Or are you such a diver? You can contact me on email at **patrick.vanhoeserlande@nelos.be**.

DIVER: Werner Graf
FIRST DIVE: 20th February, 2004
TOTAL DIVES: Currently 1,061
CLUB: Lagoondivers, Aarstelaar, Belgium
DIVE CERTIFICATION: 3*D
OTHER CERTIFICATIONS:
Rescue Diver, Youth Diving Supervisor, Deep Diver, Nitrox Diver, Divemaster and Underwater Photographer Level 1.
EQUIPMENT:
Olympus PEN E-PL7 in a PT-EP12 underwater housing with 2 INON S2000 strobes with accompanying diffusers, dome diffusers and snoots.
FAVOURITE LOCAL DIVE SITE:
Zeeland Bridge in the Netherlands, dive sites in Grevelingenmeer, Netherlands, and of course TODI.
FAVOURITE DIVE SITE ABROAD:
Wreck dives in the Red Sea, Egypt.
MOST SPECTACULAR DIVE:
A shark dive in Palau.

MY DIVING EXPERIENCES IN BONFIRE AND BLACKWATER

FEATURE **ALDO GUSTAVO GALANTE** PHOTOGRAPHY **PETER ESCHWEILER**

Both bonfire and blackwater dives are like diving within extraterrestrial worlds. They are truly mysterious, showing us critters we've only ever imagined out of science fiction films, which turns these wonderful dives into unforgettable experiences.



On this occasion I would like to tell you about some experiences I have had in these two relatively new diving and underwater photography disciplines.

Although in recent years they have become increasingly popular, the start of blackwater diving dates back to the mid '80s in Kona, Hawaii, where it is considered one of the best dive locations in the world for night dives.

WHAT IS BLACKWATER DIVING?

Blackwater could be defined as all types of nocturnal diving that takes place in open waters, deep and far from reefs. That is, any place on the planet that is several hundred metres deep could be suitable for this activity. In general terms, it's jumping into the water at night without a visible background, with the aim of attracting planktonic marine creatures with the aid of very strong sources of light. You could see very strange larvae such as ctenophores, cnidarians, pyrosomes, crustaceans, molluscs, strange jellyfish and even fish, many of them in a larval or embryonic state that often do not resemble their adult counterparts. These species can measure from a few millimetres to a few centimetres which we would rarely or never see on a conventional night dive, much less in the diurnal one. Actually, it is very difficult to describe everything that can be seen since the possibilities are endless and different in each place and immersion.

The practice of this discipline requires some logistics to make the immersion successful and in addition, it needs to be a very small group of divers. This type of diving usually has an extra cost.

As a safety element, it is recommended to use a luminous buoy linked to a weighted rope of several metres (15 or 20 approximately), where sufficiently bright lights are attached every 5 metres illuminating the area where the immersion takes place around it. In some cases, the lines are attached to the boat and in turn, the divers tether to it to avoid touching depths beyond the length of the line. This technique was the one used in Kona when I had my first experience of blackwater diving and it seemed safe and easy for beginners.

WHAT IS BONFIRE DIVING?

Bonfire diving (or diving around a light source) is somewhat similar to blackwater diving but takes place at shallower depths. Lights are placed in the background, attracting the strange nocturnal creatures, and the divers locate themselves around the lights which are placed on the reef or sandy bottom. Ideally, somewhere close from the surface, making it ideal for beginners or to train for the other more complex category.

Normally the dives are performed a few hours after twilight when millions of tiny organisms emerge from the depths of the sea to get to shallower waters in search of food and avoid predators. I say a few hours after as it takes many of these strange creatures some time to reach superficial levels from the deep depths, so it is best not to rush in just after sunset.

THE PACIFIC PIONEERS

I first came to know about blackwater diving many years ago in Kona, Hawaii with Big Island Divers. Kona is very famous for their night dives with manta rays and it is associated with blackwater diving. It is said to be one of the best places in the world to night dive

and honestly, this dive operator was very well equipped to performing magnificent and successful experiences.

At the time, we left at nightfall and after about 4 km from the coast to the open sea, we arrived at the dive site. The bottom of the site was marked at 4,000 feet (approximately 1,220 metres) on the boat's depth gauge. That is to say that below us are some serious depths which can be abyssal, and this is precisely what blackwater is all about. It's the marine critters that come up from those depths attracted by the strong lights that we anticipate. A weighted line was attached from the boat with hooks so we could harness our BCDs directly to it. After rolling into the water, we followed the line down within the safety limit. As we hung out in the abyss with the spot lights on, cuttlefish, octopus, squid and all types of strange other creatures began to appear, some that I had never seen before, such as ctenophores, siphonophores and several species that we were not able to identify. This first experience of blackwater left me in such awe and fascination, that I decided to go in search of other experiences!

THE ASIAN PIONEERS

The other great dive site and pioneer in blackwater diving is in Asia, on the beautiful and photogenic Island of Romblon, Philippines. The island is surrounded by deep waters which makes it an excellent place to dive blackwater. I have visited it on 2 occasions and stayed at The Three P Holiday & Dive Resort (**www.the-three-p.com/**) run by the three great Eschweiler brothers, who are the blackwater pioneers in Asia with vast experiences in this diving discipline.

The resort is 100% dedicated to catering to divers with particular yearnings, and especially designed for it. I have never been to a dive resort with such a wide variety of daily options and with such professional guides of the highest levels.

I could say that, thanks to the Eschweiler brothers, Romblon has become one of the world capitals specialising in macro and supermacro. The area hosts very small exotic species, from beautiful nudibranchs to different species of pygmy seahorses and shrimps such as the "sashimi shrimp", a species that I have not seen anywhere else in the world. All this thanks to Peter, Patrick and Philipp, and their incredible dive guides; Favia Imhof with whom I had the honour to do most of my dives with, and a very sharp spotter at that. In addition to macro sites, Romblon also has some very good reef locations for wide angle.

I remember the first blackwater dive I did with them when I shared the boat with world renowned Chinese underwater photographer, Liang Fu, along with Peter Eschweiler who is also an extraordinary underwater photographer. With these buddies you are highly inspired to get some great images!

Before the dive, a highly detailed briefing is carried out to guarantee the success of the dive and avoid any risks. During the dive, the guides look for subjects so the photographers can get some good shots, although their main job in these dives is to ensure the safety of the group since it is easy for a photographer to get distracted when shooting amongst such marine diversity and lose the notion of time and space; since in this case, we were not tied to the boat.

For beginners, there is bonfire diving which is less complex and also very interesting. It's useful for training in photography and becoming familiar with dark waters as a step to getting ready for blackwater dives.

Romblon gave me the opportunity to see and photograph my first argonaut, or paper nautilus (*Argonauta*) which was a great joy for me, besides the other hundreds of marine species I cannot name. Most of the critters observed in Romblon Pass are somewhat smaller than in Hawaii and extremely varied, so macro and supermacro lenses are highly recommended.

I would like to make it clear that taking good pictures during a blackwater dive is not easy, in fact, it is very difficult, since there is nowhere to lean and everything constantly moves (the boat, us, the subjects, etc). The marine life is in constant motion and many are totally transparent, easily absorbing light with the dark background. The approach is a challenge which makes it one of the most difficult images to take in nature.

In my humble opinion, blackwater and supermacro, are the two most complex types of photography to achieve.

BLACKWATER DIVE LOCATIONS

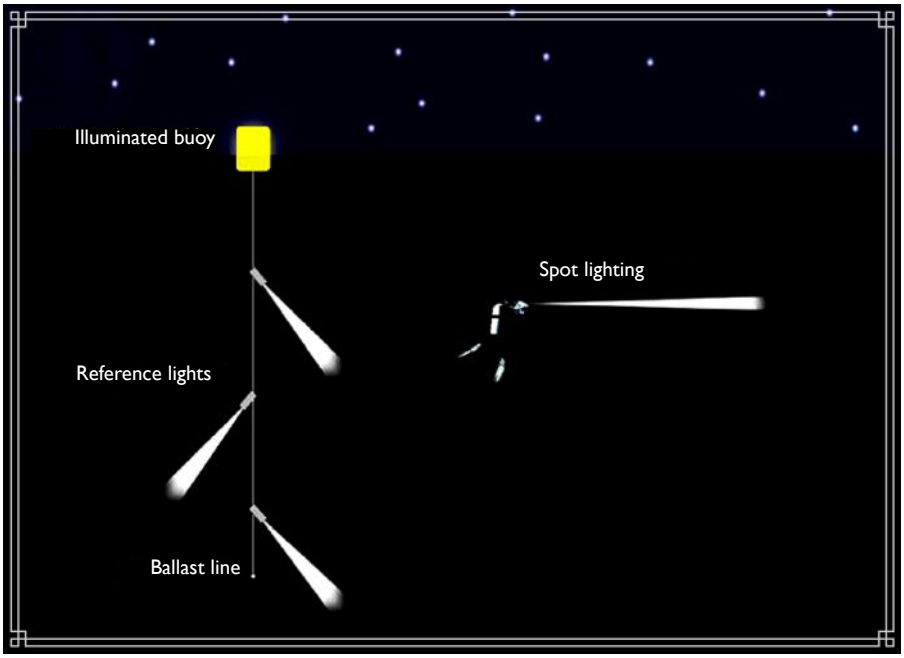
In addition to Kona and Romblon, there are other emblematic places to practice blackwater dives. To name a few, they are:

- Anilao, Philippines
- Lembeh Strait, Indonesia
  (These 2 have some of the best dive sites in the world for blackwater macro photography).
- Southeast Coast of Florida, USA. Pura Vida Divers in Palm Beach take some amazing photographs.
- The Azores, Portugal. There are depths of up to 3,000 metres. This is a serious abyssal zone.
- Roatan, Honduras. Depths can reach down to more than 2,000 metres.
- Republic of Palau, Micronesia. Depths of 1,000 metres.

It is likely that in the course of time, the world will continue to add locations to this practice. I hope that someday I will be able to try it in the waters of my beloved Argentina as I believe there to be some wonderful dives there. The creatures of the deep are present all over the world, they are just waiting for us to find them.

Both bonfire and blackwater dives are like diving within extraterrestrial worlds. They are truly mysterious, showing us critters we've only ever imagined out of science fiction films, which turns these wonderful dives into unforgettable experiences.

I want to especially thank Peter Eschweiler from The Three P Holiday & Dive Resort for his kind and selfless collaboration, and providing me with some of his wonderful images.



THEY CANNOT WALK, BUT THEY CAN DIVE!

FEATURE **FARAH ARIFAH AZMAN, PADI ADAPTIVE TRAINED SUPPORT DIVER**

"On the ground my movements are inhibited, however, in the water I am no longer restricted and move with complete freedom, an experience I shall never forget."


seac
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In an instant, the soothing breeze that caresses your face turns to a thousand cold needles. Piercing every inch of your skin. Mind panicking, pulse racing, eyes shut tight, all in response to this unforeseen attack as you summon every ounce of will to block out the pain.

All seems lost as the darkness envelops you in its cold embrace. Exhale. The pain is replaced by an unfamiliar sensation, a numbness that is almost pleasant. The cold is bearable now, yet your movement is slow and uncoordinated.

Inhale. You begin to relax, your eyes slowly open, it's a new world under the surface. So many shades of blue you'd be forgiven for thinking that you were transported into a painting. It is all so real though. Schools of fish dive and dart avoiding you as you explore the colourful coral reef. You gaze in awe at the grace and agility of their movements.

Transfixed on the fish, you forget about your worldly troubles and embrace the serenity of the reef. This scenario is all too common for most divers, yet on this occasion it is especially rewarding as half of the individuals on this dive are special. Paraplegia, quadriplegia, visual impairment, cerebral palsy, PTSD. These are but a handful of conditions that keep sufferers constrained on land, yet with a little training and the right gear, they are able to experience freedom underwater too.

Welcome to Diveheart, a non-profit organisation based out of Chicago, USA. Their objective is to develop the confidence, self-esteem and independence of veterans, adults, and children with disabilities through scuba diving and scuba therapy. Founded in 2001 by Jim Elliot, Diveheart now has global affiliates dedicated to certifying instructors in the speciality of diving with disabled individuals. One such affiliate based in Malaysia is Kids Scuba, which is run by Hj Syed Abd Rahman Syed Hassan, Malaysia's Diveheart Ambassador.

With being a member of the Professional Association of Diving Instructors (PADI) for the past 29 years, Hj Syed Abd Rahman has played an instrumental role in developing the PADI Adaptive Techniques Speciality course. He has been with both the PADI US Advisory Board on Adaptive Techniques Speciality Training and PADI Youth Diving Education which empowers instructors with the tools needed to teach disabled individuals how to safely navigate open waters.

"Participants of the course learn how to successfully adapt teaching methods to the needs of the student, while maintaining the integrity of performance requirements and developing new tools for the instructors themselves," explains Syed Abd Rahman.

It is the boundless passion and generosity of individuals such as Jim Elliot and Syed Abd Rahman that has made an everlasting impact on the lives of individuals such as Nurul Fatihah Jamaluddin, a 30 year old paraplegic from Banting, Selangor who has been paralysed from the waist down since an accident 15 years ago. Nurul was chosen as one of six persons with special needs to participate in an open water scuba diving course in the waters surrounding Pulau Bidong, Terengganu in a collaboration between Diveheart Malaysia, University Malaysia Terengganu (UMT), Kids Scuba PADI Dive Center and University Malaya Medical Center UMMC.

"On the ground my movements are inhibited, however, in the water I am no longer restricted and move with complete freedom, an experience I shall never forget," said Nurul Fathiah.

Yet another triumph of the human spirit

through scuba can be seen through 28 year old Ahmad Nazri, a wheelchair Malaysian Paralympic basketball athlete with an amputated leg resulting from a cancer diagnosis as a teen. Nazri is no stranger to extreme sports as he ascended Mt Kinabalu to raise funds for cancer research in 2014. It took six months of basic training at a pool in Kajang under Syed Abd Rahman before Nazri could participate in the programme which involved 30 UMT divers and volunteers.

Another case of Diveheart's impact can be seen in Kuching Sarawak, Borneo where Freddick Jilam, 26, is undergoing scuba therapy after an accident 3 years ago left him wheelchair bound.

"Three individuals in Peninsular Malaysia have also undergone scuba therapy; one of whom suffers from a condition worse than Freddick's. When a person is able to do more than what they believed to be possible, the mind is strengthened. We intend to transform this into a long lasting programme," said Ernest Teo, who is Diveheart East Malaysia's coordinator.

After his first ever dive experience which lasted nearly half an hour, Freddick was upbeat and already looking forward to his second dive. With a smile on his face he said, "I feel different under the water, I feel light".

It is heartfelt moments such as these that drive all those involved with Diveheart across the globe to continue devoting their time and energy to help those with disabilities, yet more is required to keep the programmes running. Diveheart relies on corporate and private donors. Although they do not receive funds directly, there are channels in place for Persons with Disabilities (PwD's) to have their lessons sponsored, usually for participants of four. Mr Teo welcomed corporations to make pledges under their Corporate Social Responsibility (CSR) initiatives.

Meanwhile the quest continues for Jim Elliot as the next chapter for Diveheart sees him champion his cause in Putrajaya in front of officials that oversee Tourism Malaysia. It is his intent to develop Malaysia as an international destination for divers with disabilities as well as those seeking to obtain accreditation in adaptive scuba training. It is a huge step forward in the region and a lesson to all nations great and small.

"Collaborating with Tourism Malaysia presents a substantial forward move for Diveheart to market Malaysia as the premier adaptive scuba training and diving destination for individuals with disabilities in Asia and beyond," said Elliott. "I told the officials that developing a Diveheart programme for Malaysia could be the blueprint for the rest of the world to follow. I'm overjoyed that Malaysia is taking the initiative to advance adaptive dive training, scuba diving and programming therapy research in Asia."

The catalyst for Malaysia making such progress in scuba diving and adaptive dive training is none other than Syed Abd Rahman, the founder and director of Kids Scuba, a PADI dive center that supports Diveheart in Malaysia. A passionate and charitable human being with the drive and vision to make the world a better place, especially for those suffering from disabilities.

"Syed has been instrumental in ushering a fresh era in Malaysia and sets himself apart by choosing not to define people who have disabilities by their disability, but truly by their abilities," Jim Elliott, President Diveheart, Chicago, USA.

GARBAGE IN THE OCEANS

"THE SEA RETURNS TO US, WHAT DOES NOT BELONG TO IT"

FEATURE AND PHOTOGRAPHY **ALDO GUSTAVO GALANTE**

Since immemorial times, human beings have been disposing their waste improperly and they use the surrounding waters near their homes to brush it aside, hiding garbage out of sight, out of mind.

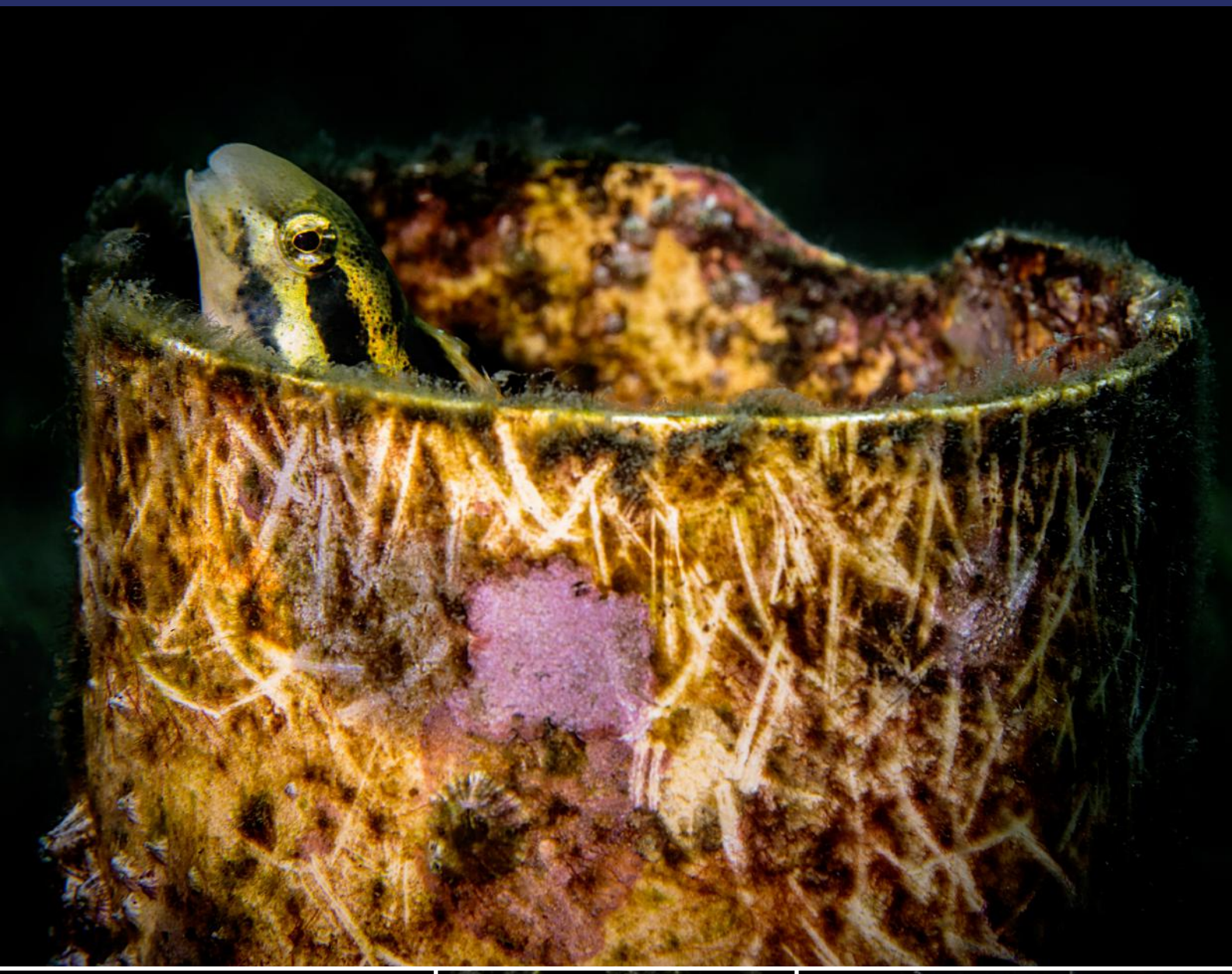
Cardiovascular Surgeon by profession and Diver at heart. I have managed to make these two very dissimilar passions, come together for almost 30 years!

Underwater Photographer by chance. I decided to photograph what I was seeing on each of my dives for the sake of memories.

In my work as a doctor, I have managed to photograph marine species in many different parts of the world. I could say that I was also interested in marine biology from a very young age, as I have always deeply admired the biodiversity that exists in the oceans. I have been able to photograph different species from 41 countries around the world, ranging from a few millimetres in length to incredibly large ones.

In 2005 I began to realise that the garbage in the sea was no longer a casual encounter and the small litter that I used to tuck into my BCD to dispose of after the dive was getting out of hand. There was so much of it, I couldn't store all of it in my pockets. Due to the great impotence that it caused me, I decided to start taking images of marine fauna alongside marine litter whenever the two came together. I have taken thousands of spontaneous photos (nothing is ever altered for the shot) and at the same time, my concern for the marine environment grew.

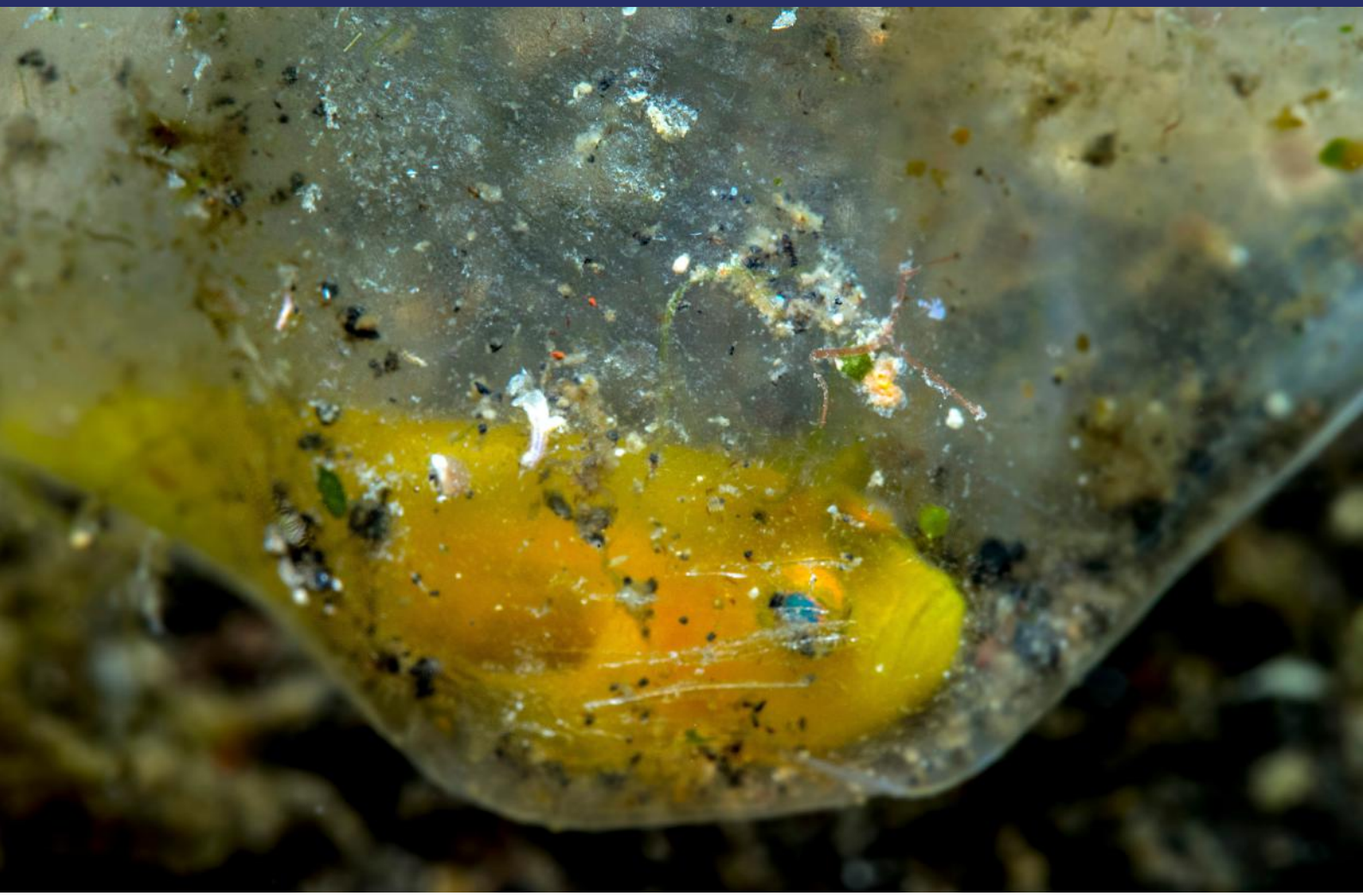
Many people must wonder why a cardiovascular surgeon would bring about this issue. The



reason is simple. I'm concerned with having seen so much destruction in our world and I want to do something about it as a doctor and a lover of the sea. This planet is our only home where life is possible. If we continue in this way, it will no longer be habitable and that turning point is getting close. I did once ask myself, what was the point of saving human lives in our daily work as doctors if we don't take care of saving our planet? All that effort could be in vain since ecological disasters can take the lives of hundreds of thousands of people in just a few minutes. Pollution and marine litter are key points in the problems of our world today.

Thanks to all the underwater images related to marine litter I have taken during the last few years, I won a 1st place prize for 'Best Photo Gallery' in the category,'Ecological Denunciation' at CIMASUB 2018 in San Sebastian, Spain (International Cycle of Submarine Cinema), where I presented a series of my underwater photography related to garbage. It is worth noting that it was the first year that this category was introduced, due precisely to the rapid rise of this problem.

This has been a brief summary explaining why I am so interested in this topic. I will get to the topic of international public health, of which we are all guilty (to a greater or lesser extent). I believe that we should all take precedence with this in order to achieve the change we need, which depends exclusively on us as a supposedly intelligent species.



WHAT DOES GARBAGE MEAN EXACTLY?
The term garbage refers to any unusable waste or any unwanted material that you intend to dispose of. This is a definition that leads us to think that everything that does not serve us as humans is discarded, and unfortunately, here is where the problem in question begins.

We all very well know that a lot of garbage is properly treated, but there is a side to it that ends up in the oceans with the marine life who have no idea where it comes from, what it is, or how dangerous it can be.

A few years ago I wrote an article about 'The Good Side of Garbage' for the Argentinian dive magazine, TDF, where I made reference to some of our waste, such as glass bottles, containers, sunken ships, etc., which may serve as protection to some species against predators, or they use them as hideouts or as homes. But, anything that does not belong to the sea, rivers and/or lakes, is garbage and should not be found in any natural body of water in the world.

Since immemorial times, human beings have been disposing their waste improperly and they use the surrounding waters near their homes to brush it aside, hiding garbage out of sight, out of mind.

We are now close to 8 billion people on earth, and we continue to treat our waste in almost the same way. Imagine all the human masses around the world that deposit their waste at their doorstep and as if by magic it all disappears without anyone knowing where it ends up. In many developed cities waste may be treated in the correct way, but in less developed cities in other parts of the world, this is not so. Remember that much of the world's populations live along the coasts that are subject to storms, hurricanes, extreme rainfall – and when this happens, all that waste ends up in the oceans.

In addition, many island populations with low economic and educational resources sends what no longer serves them directly into the sea. They do not have garbage collection services and the sea is the only place where garbage "disappears". That is how our beloved waters, and especially the seas have become gigantic rubbish dumps. It seems to be irreparable damage, at least thus far.

It is estimated that between 10-12 million tonnes of rubbish ends up in the seas each year, and this will surely continue to increase if we do not do something urgently at a global scale. From this waste, almost 90% is plastic, of which about 200 kg per second is thrown into the seas around the world. According to the study carried out by the University of Georgia in 2018, there are more than 6,300 million tonnes of plastic rubbish on the planet and it was estimated that by 2050 it could reach 34,000 million tonnes if this does not stop.

Plastic is our most worrisome material to exist since most species are directly affected by it. We have reached alarming figures. About 1 million seabirds and about 100,000 marine mammals die each year due to plastic, either by ingesting it, or by getting trapped in it – according to data from the European Environment Association (AAE for its acronym in Spanish). 70% of the garbage ends up at the bottom of the sea and can reach abyssal depths, far from our possibilities to extract it. 15% floats in open waters and another 15% reaches coasts.

Argentina is among the 30 countries that pollute the seas the most with plastic waste. It is noted by the first study that quantified the global amount of waste that reaches the seas annually. In first place ranking, China leads, followed by Indonesia, the Philippines and Vietnam. Brazil is ranked 16th, the United States 20th, and Argentina is at 28. The survey was compiled by researchers from the University of Georgia and California.

As if the garbage issue were not enough, technology and chemical waste, such as batteries, fluorescent lamps, radioactive substances, acids, petroleum and a great many more that have been added in recent years, are deadly toxic to our waters and the marine life, causing irreversible destruction to the environment.

The amount of garbage in the ocean is so huge that, due to the circular marine currents,

large areas of garbage have been created up to 10 metres deep or more. Many of them are of colossal sizes and they have been called, "Garbage Islands" or "New Continents". In these areas it was observed that there were 6 times more plastic than plankton! It has also been concluded that in a few years or so, the amount of garbage in the sea will exceed the amount of fish and marine life; something that perplexes the most sceptical of people.

If the story and images of these marine creatures "coexisting" with our trash does not alarm us, the story continues as this is not all of it, yet.

Common plastic is not biodegradable. With the passage of time, pieces of this material is divided into smaller and smaller pieces, forming what is called microplastics and nanoplastics. This means the smallest possible particles from this material ends up in the waters of all the rivers and oceans around the world. If they do not settle as sediment or freeze in the Arctic ice cap, they enter the food chain, consumed by plankton, fish that feed on plankton and even in the water we drink. Thus, garbage ends up on our plates, with probable and serious consequences for our health, something that is still being studied. There is no longer a single square kilometre of seawater that is free of plastic particles.

Nowadays, approximately 92 kg of plastic per capita is consumed annually in Western Europe and this amount continues to rise. World use per capita is around 35 kg per capita! Perhaps the study of plastic could become a new medical speciality focusing on its consequences in humans, and it could be called "Plasticology"?

The microparticles of plastic, in addition to being in the water, are also in the air and in the earth, since these three natural elements go hand in hand. Time will tell us what damage is caused to us from consuming this long-term material. Nobody knows its scope yet.

The problem is of such magnitude, that in 2018 the Foundation of the Urgent Spanish (Fundéu) recently chose the term "microplastic" as the word of the year. Unfortunately, this new environmental nightmare of the 21st century is highly talked about, but scientific information is still very scarce worldwide.

It is very likely that while you were reading this subject, you have ingested or inhaled microplastics without realising it. Something that, unfortunately, is unavoidable at present.

I would like to thank Mr. Daniel Rolleri, Director of the European Environment Association and Vice President of the Spanish Association of Marine Litter, for providing me with very valuable and reliable information about this serious global scourge.

Without blue, there is no green!

Photo by Christiane Linkenbachs

EMERGENCY TRANSMITTERS FOR DIVERS:

WHAT YOU KNOW COULD SAVE YOUR LIFE

FEATURE **CHRISTIANE LINKENBACH**
TRANSLATION **PETER SYMES – PUBLISHER & EDITOR-IN-CHIEF – WWW.XRAY-MAG.COM**
PHOTOGRAPHY **PIXABAY**

As a diver, how does one rescue oneself when in distress? Call rescue services?
How do the different emergency frequencies work? Which one is the most efficient for divers?

DIVER IN DISTRESS?

Yes, divers get into sticky situations too, and more frequently than one might think or read in the media. In particular, it happens whenever divers surface too far away from the dive boat, because they got caught in a current. Adrift alone, or with a buddy, divers find themselves in the same life-threatening predicament as sailors falling overboard from a boat that just keeps sailing away.

It has been the sailing industry that has long since looked into safety measures and devices and come up with what is known as "MOB transmitters" (MOB: man-over-board), some of which are also now being made as depth-rated models for divers.

OLD WINE IN NEW BOTTLES?

These transmitters provide divers with some degree of peace of mind, because what is good for sailors must also be useful for divers, and one need not be concerned with obtaining a licence and undergo a lot of training to operate them. After all, these devices have been in use for years. It is just that divers are not usually given any training or much insight into sea rescue procedures and the use of marine radios. A maritime radio licence is not required to go diving. But ignorance can kill here too.

Imagine an average diver, Joe, who visits some dive expo looking for inspiration for his next dive trip. He sees all these seductive presentations of paradisiacal resorts and alluring waters when he suddenly finds himself in front of a poster depicting a diver lost at sea. The advert cleverly targets a latent fear, and Joe is drawn to take a closer look at the advertised rescue system.

The gadget is labelled with various known certification markings such as CE, FCC and EMV, along with some other more or less familiar symbols, which is comforting. It looks trustworthy. It is handy, small, well-built and capable. The sales representative comes up to Joe, all smiles, and relates how he once resurfaced far from the boat himself and understood the fear. But because he had this gadget, he was soon safely back on the boat – and Joe should always wear one too. Joe is not quite sure what to make of the technical specifications but feels reassured that it would be good insurance against being lost at sea, and his worries are put to rest.

This is, of course, a made-up stereotypical scenario but one that often plays out in some shape or form – depending on the product, its operating principle and distress frequencies used, and of course, the competence of the seller as well as the previous knowledge of the diver. Being unfamiliar with some topic is something we can all relate to, so what do most of us do? We seek advice, which is all good, provided the guidance is trustworthy, accurate and relevant – and when it helps us to make the right decision and purchases that suit our needs. But how do we make heads or tails out of sometimes conflicting information and recommendations? And how do we see through the sales and marketing babble?

"THEY HAVE TO SAVE YOU!"

So, the smooth-talking sales rep has managed to build a rapport with Joe by relating to him that he too has experienced surfacing far from the boat. "Been there, done that!" he says and proceeds to describe his product in more technical terms. Some of the lingo Joe has heard before, but he does not quite understand how this gadget is the solution to the problem. Joe does not want to come across as ignorant, so he does not raise many questions. In between being lost in the technical jargon and mentions of AIS, DSC 70, EPIRB, channel 16, PLB and 406 MHz, he also hears two reassuring sentences: "Everybody welcomes you here" and "They must save you."

Next up is the question of price. What does such a device cost? Typically, prices are in the 150 to 400 USD/EUR/GBP range, which stings a little, but not a big price for a potential life-saver. And since sailors also use this device, as the sales rep keeps emphasising, it is fair to presume Joe would be oblivious that his intended use of the device may not always be legal. That is too absurd to contemplate. Who cares about formalities when lives can be saved? Who would not rather commit an offence than die?

Saving lives and responding to distress always takes precedence over adherence to formalities and procedures, the sales rep reassures Joe, who ends up making a purchase. He leaves the booth feeling good and resumes looking at travel destinations, convinced that he now has a transmitter that will alert every vessel

within X nautical miles about his predicament, in case he ever ends up in distress and needs to be rescued.

DANGEROUS PRESUMPTION

Every vessel? Not quite. Let us have a closer look at what really happens when a personal device is activated and how a captain of a commercial vessel, which may be transiting beyond the horizon, in all likelihood, would react. Is it safe to assume that such a vessel would receive the distress call and turn around? Are they obliged to respond to any MOB alarm raised by leisure crafts, sailors, wind or kite-surfers and divers? The notion that "they are obliged to come to your rescue" may suggest this is the case, underpinned by the fact that coming to the rescue at sea is mandatory. Under international maritime law, a skipper is obliged to provide immediate assistance within his or her means when he or she becomes aware of an emergency. This obligation is also stipulated in the International Convention on Maritime Search and Rescue.

But what does "within his or her means" imply? While sales reps and customers may have their discussions of what triggers an emergency response, they rarely consider the position of the rescuer who may have to provide assistance. First of all, the captain of a large ship – perhaps up to several hundred metres long – is primarily responsible for the safety of his or her crew and any passengers aboard, the vessel and its cargo, as well as his or her own life. Is it reasonable to assume that such a captain can just stop, turn around and provide assistance?

No, it is not. Considering the momentum of a heavy ship travelling at speed, it is quite unlikely the captain is able to assist most leisure water-sportsmen in distress. With a stopping distance of several nautical miles, it takes a good long while before a big vessel – say, a passenger liner, cargo ship or tanker – comes to a halt. Around busy or constricted shipping lanes, it may also be impossible for a big vessel to alter course due to risk of collision with other traffic. That is also why most other ships cannot easily stop either.

If the emergency takes place in less-frequented waters – say, south of Brothers Islands in the Red Sea – a change in course may represent a rather low risk for the ship. However, it still takes considerable time before a freighter can turn about and make it to the drifting diver, because it must be slowed down early in order not to overshoot the diver. You never hear of such spectacular manoeuvres because they do not occur in reality.

FUEL VERSUS RESCUE

Often, the captain is unable to turn around even if he or she wanted to. In many cases, ships are only carrying a precisely calculated amount of fuel, which does not allow for such a turning manoeuvre. Without required reserves, it could leave the ship short of fuel to reach the next port. Shipping has become highly competitive, and time constraints are tight. In order to carry as many containers as possible, the amount of fuel carried is precisely calculated and will only include a small "storm reserve." These calculations are so finely tuned that they even consider the different water densities of the various seas. The Mediterranean and the Red Sea are particularly popular with shipping companies, because the higher salt content provides more buoyancy, allowing for more cargo.

If a cargo ship south of Brothers Islands receives the distress call from a drifting diver, the captain may well be left with no choice but to carry on, as any action could deplete designated fuel reserves. Accordingly, it would thus not be "within the means" of the captain to provide direct assistance.

Rather, the captain would notify the nearest Maritime Rescue Coordination Centre (MRCC) of the emergency – in this case, the MRCC in Jeddah. The centre in Jeddah would most likely forward the alert to the Egyptian MRCC in Alexandria, which will coordinate the mission. Next, Alexandria would alert the Egyptian SAR (Search and Rescue) in Marsa Alam or El Quseir from where a boat would be dispatched. It sounds complicated, but it is the quickest way, because Jeddah is a lot farther from the scene of the accident than the two Egyptian cities (whose ports are too small for the largest vessels to approach). In any case, it goes to show how many unknown factors and how many elements are involved in a rescue operation.

In 2003, a Danish diver who aborted a dive on the Thistlegorm wreck was accidentally spotted some 20 nautical miles away by the crew of a freighter, after being adrift for 20

hours. Instead of stopping and turning, the captain radioed the SAR in Sharm el-Sheikh, which immediately went to the designated location and rescued the diver. Thanks to the SAR station being relatively nearby, the rescue could be carried out in a targeted manner. The diver was in many ways unbelievably lucky: Not only was he spotted by chance but survived the ordeal unscathed, after drifting across the busy shipping route between Sinai and Shadwan Island at night without being hit by any of the many passing vessels.

CHANNEL 16 AND PROPER PROTOCOL

Often, captains are merely unable to assist in a rescue. But at other times, they are not obliged to – for example, when an emergency call is not placed according to protocol. It may sound unbelievable, but it is so and for a good reason: More than 90 percent of distress calls on various maritime radio frequencies are false alarms. It puts captains and rescue services in a dilemma when leisure craft skippers are simply testing emergency calls to see if they work. Others are simply misusing channel 16, which is the marine VHF channel designated as an international distress frequency (156.8 MHz). Primarily intended for distress, urgency and safety priority calls, this frequency may also carry routine calls to establish communication before switching to another working channel, blocking the channel and preventing real emergency calls in the process.

The consequences of not following protocol can be dire, because emergency calls on channel 16 only have to be reacted to if the caller is unequivocally recognised as an "authorised user." This happens automatically when the emergency call is issued in accordance with the prescribed protocol form – in other words, when the emergency caller knows and uses proper "radio language."

Although communication is conducted in English, command of the language is not enough. In order to effectively broadcast on channel 16, one is required to have at least an SRC (Short Range Certificate) – a licence for leisure crafts and water sports. Professionals must have an LRC (Long Range Certificate). During the course, the correct procedures and emergency call protocol regarding channel 16 are taught.

Depending on the incident, a distinction is made between an emergency report, an emergency message or a safety message. Even calling off a (false) alarm must be made following a specific protocol.

CALLING "MAYDAY, MAYDAY, MAYDAY" IS NOT ENOUGH

Protocols dictate how an emergency is declared, how the caller presents him or herself and how the emergency is described. The call must include the name of the ship and its radio call sign – ideally, also the MMSI (Maritime Mobile Safety Identity), which is an individual ship identification number comparable to the chassis number of a motor vehicle. As complicated as such strict protocols may appear at first, they are actually very effective, as they ensure life-saving information such as the type of vessel, number of souls aboard, GPS (global positioning system) position and nature of the emergency is expediently and clearly relayed to the parties in charge of rescue.

To ensure that emergency calls are correctly placed even under panic or shock, stickers and cards listing these procedures for correctly placing maritime radio emergency calls can be kept on or beside the radio. These aids also allow crew members without SRC to call for help. Having a radio licence does not matter. Placing the call correctly does, and just yelling "Mayday, Mayday, Mayday" into the ether will not help.

So, if Joe ever finds himself adrift at sea and calls a passing ship on channel 16, without following protocol, he may find that the ship just continues on its course. The captain will likely consider him yet another prankster who clogs channel 16 worldwide, and as a result, the nearest MRCC will not be notified. That a diver could be lost at sea for real is probably the last thing on the captain's mind, and Joe would only have himself to blame for being left at sea.

DSC 70

Some distress rescue stations for divers are also equipped with digital selective calling or DSC, which was developed to replace a voice call in older procedures. DSC senders are programmed with the ship's MMSI and may be connected to the ship's GPS, which allows the apparatus to know what ship it is, what time it is and where it is. This allows a distress signal to be sent very quickly. Until a few years ago, this channel was only installed in radios that were permanently installed in

the wheelhouse. Personal MOB transmitters equipped with channel DSC 70 have only been on the market for a few years.

It is important to note that if MMSI is not entered into the transmitter, the capability to place DSC 70 emergency calls is deactivated and cannot be used. This feature is there to prevent the widespread abuse associated with channel 16. Since an emergency call transmitted on DSC 70 has a range of up to 60 nautical miles, any misuse or false alarms would be heard by quite a few.

THE INTERNATIONAL TREATY

Responding to emergency calls over DSC 70 is obligatory, as per the international treaty governing the use of the radio-frequency spectrum. The first ship to receive a distress call on its DSC 70 receiver must acknowledge the alarm and is required to coordinate the rescue. Once the alarm is acknowledged, it will be deactivated to clear the DSC 70 channel for any other emergency calls.

Despite DSC 70 being strictly regulated as well as the requirement of an SRC being in place, problems with false alarms are also on the rise in this area. When purchasing a personal transmitter, it is therefore important to ascertain that the built-in DSC 70 button can only be used once an MMSI has been associated with the transmitter and that distress calls made over DSC 70 can be deactivated by other vessels. This feature indicates whether the personal rescue system is legal or not. Also, some transmitters are unable to receive confirmations, or be shut off remotely, once alarms have been received.

Devices that do not meet the requirements may put the whole system at risk and jeopardise everybody's safety at sea. Already in 2013, FSR – a German trade association for rescue equipment – warned that "the effectiveness of the entire system of mutual assistance at sea is in danger" due to improper use of handheld radio devices with a distress button.

While some argue paragraphs and applicable laws are required to restrict access to maritime rescue frequencies in order to prevent abuse, others argue that modern hi-tech needs to be made readily available to the increasing number of people on the water in order to comply with SOLAS, the International Convention for the Safety of Life at Sea – an international maritime treaty which sets minimum safety standards.

This makes for a delicate balancing act for decision-makers. On one hand, every human should be rescued as soon as possible! On the other hand, the use of emergency frequencies must be internationally regulated so rescue can be carried out promptly. In any case, it is of paramount importance that misuse and incompetence is reduced, as each emergency call blocks the rescuers from other operations.

CLOSED LOOP OR OPEN LOOP

Among the latest technology now available are MOB transmitters using a so-called "closed loop mode," which makes it possible to call for assistance without raising the alarm with every vessel within range. In this mode, the emergency call is only received by DSC 70 receivers on vessels whose MMSI numbers have been previously stored in the transmitter. This does away with the principle of a big alarm being broadcast to everybody within range, because past experience has shown that it is not necessarily safer when all surrounding vessels hear of the emergency.

Moreover, DSC 70 transmitters may also be used in closed loop mode by users who do not hold a marine radio license. This could, however, change on short notice, as such devices will automatically switch to the open loop mode after seven to ten minutes if the alarm is not confirmed by one of the programmed receivers, after which the call goes out to all vessels within range as before.

For this arrangement to work, it is assumed the dive vessel is equipped with a corresponding DSC receiver. However, as it is not mandatory for all vessels to carry receivers with channel DSC 70, it should never be presumed they have one installed. For example, many dive centres work with different day boats, which are hired locally, such as dhonis, Philippine outriggers, or inflatable boats – none of which have an MMSI.

In order to fully appreciate the advantages and limitations of using DSC 70, it is therefore necessary for our average diver Joe to gain a deeper understanding of how the technology works and its limitations. Only, few divers do.

Our friend Joe has done his homework, and on his next dive trip, he arrives on location

with his newly purchased transmitter with a DSC 70 button for closed loop function. Once aboard the dive boat, he asks the crew about their MMSI, and to his chagrin, finds that nobody has any idea about it – or worse, that there is no DSC 70 receiver on board.

AIS

Such scenarios apply equally to Automatic Identification System (AIS) frequency emergency transmitters, which require special on-board receivers to receive the AIS signals. Originally, the AIS was developed as an "anti-collision system" for commercial shipping. Using the AIS frequency, vessels exchange information on their position, ship's name, weight, load, speed and so on. Since 2000, the system has been mandatory for commercial shipping worldwide.

In order to receive information from other vessels, an AIS receiver is required. This is connected to a plotter (screen) on which a digital nautical chart is displayed. On this chart, every vessel is displayed in relation to other ships and constantly updated. Thanks to stationary terrestrial antennas, it is even possible to detect ships when they are still behind headlands or cliffs and not yet visible. Since the implementation of this system, the number of collisions at sea has fallen sharply worldwide.

The AIS industry is happy to suggest that AIS receivers are now installed on every ship. In doing so, it relies on the International Maritime Organization's (IMO's) regulation that every commercial vessel must have AIS on board. In reality, that is not the case in every region of the world, because the IMO allows its member states so-called "national exemptions," of which some popular dive destinations such as Egypt and the Maldives make use.

In the Maldives, cargo ships approach the port of Malé in a large arc and not through the atolls, and there are no terrestrial AIS antennas there. As a result, the Maldives government does not require AIS equipment aboard dive boats and dhonis. In Egypt, the government is protecting the fishermen, who operate as micro-entrepreneurs but cannot afford AIS. Therefore, in Egyptian territorial waters, AIS is allowed but not compulsory. Consequently, many dive vessels there are not equipped with an AIS system either.

AIS AS AN MOB ALARM

Since AIS became compulsory for commercial shipping, the AIS industry requested the IMO to also authorise the frequency for personal maritime rescuers, so the improved safety in seafaring could find its way into personal rescue. AIS MOB transmitters hit the market in 2010 and caused some hype among sailors. The royalty-free AIS frequency does not require an SRC, so sailors were able to equip their life jackets with an AIS transmitter. As the stations sold very well, the AIS industry was obviously quite pleased.

Much less happy were search-and-rescue teams, coast guards and commercial shipping, which soon experienced a firework of alarms on their plotters. Although each AIS-MOB transmitter has a "test button" to simulate and train emergencies, most of the MOB training was unfortunately done with the "sharp" alarm button. In areas with heavy traffic such as the bay of Kiel in the southwestern Baltic Sea – which is rife with ports, marinas, wharfs, a naval base, busy ferry crossings and lots of leisure boats – the plotters became swamped.

TRANSMITTER CLASSES A AND B

To differentiate between commercial shipping and leisure craft, two classes of transmitters were defined: "SART Class A" and "SART Class B" (SART: Search And Rescue Transponder).

SART A transmitters for commercial shipping send data in intervals between 30 seconds and six minutes. In order for each signal to be seen by the other subscribers in the AIS system, the devices reserve time slots in the system. Meanwhile, SART B transmitters used by recreational sailing must wait until a free time slot is available for the transmission of the radio signal, which works reliably if enough time slots are available. But in regions with heavy traffic such as the English Channel, the SART B signals of recreational boating may not get through and will not appear on the plotters of the surrounding ships. This has prompted some entrepreneurs to develop some special class A transponders for pleasure

craft, which cost over 2,000 Euros, in order to increase their chances of being spotted.

AIS MOB TRANSMITTER CLASS A

Personal AIS channels are categorised under class A, so they are given high priority since they are (in theory) only activated in the case of an emergency. However, since they are just battery-powered, they have the weakest power of all AIS broadcasters – just one watt. Thus, the signal would stand little chance of getting through in regions where all time slots are occupied.

Another restriction is that plotters built before 2010 do not recognise the MOB icon in the AIS system (an X in a circle). On these older screens, the received signal would display as a triangular icon, which is the symbol for a ship, which may obfuscate the true nature of the emergency.

WAVES ABSORB RADIO SIGNALS

Many AIS handheld units also require an antenna to be unfolded, or unrolled, prior to use. As a result, they may not be deployed vertically but in some other position, which is not optimal for transmission. It is already a significant challenge that water absorbs radio signals, and sea waves block the transmission. One must therefore also understand the physical circumstances at play and how they may affect the transmission of an emergency signal.

Such complications do not exactly make it any easier for our average diver Joe to make heads or tails of the technical information. One brochure may, for example, state that the transmitter has a range of 55 km – which, in a strict sense, may be true. However, this may only apply when the transmitter is mounted high up on top of a wheelhouse of a big ship and connected to a tall antenna. It should therefore never be presumed that the stated range and other performance data also apply to personal units handheld by a drifting sailor or diver – except where explicitly specified.

FACTORS INFLUENCING TRANSMISSION QUALITY AND RANGE

Water absorbs all radio frequencies used for emergency signals, so waves of any significant height will block most of the transmission. On top of this, AIS alarms will be further attenuated if the antenna is not held vertically but at a slant. The biggest limitation, however, is the low transmission power of only up to one watt maximum for battery-powered handhelds.

Even in areas with low traffic, AIS-MOB transmitters cannot be expected to reach their stated maximum transmission range of up to eight nautical miles (15 km). In reality, most will only cover 1.2 to 3 nautical miles (2 to 5.5 km), which various reviews have demonstrated.

It is quite important how high up the receiving antenna is mounted – the higher it is, the better the range! Dive boats rigged with sails are able to mount their receivers high up on the mast where it can pick up alarms from longer distances. But when it is mounted on the roof of a small cutter, the diver better not have been drifting far, the sea better be smooth and there should only be a few ships around, for the AIS distress signal to go through. On a side note, it should be added that the density of the atmosphere, the curvature of the earth and even solar storms also affect the range of a radio transmission wave. In any case, there are so many factors, which come together in a complex manner, that it is impossible to put it in a simple formula. Any statements to the contrary are either unscrupulous or incompetent (or both), and can have dire consequences for users who do not know otherwise.

It would thus be a welcome change if dive training organisations would provide some basic knowledge of how sea rescue works, given the fact that distress rescue stations are increasingly pushing into the diving market. It does not mean that divers or even instructors should necessarily have an SRC. But they should at least possess knowledge of how present-day sea rescue works, how it is structured, and which safeguards have been implemented to keep thoughtless individuals from messing about with this crucial system.

EPIRB

It was during the 1970s when the United States, Canada, France and the Soviet Union came together and jointly developed a global rescue system for commercial shipping, despite all the political tensions following the

Cold War. At the time, nobody envisaged how many different functions it would eventually comprise. The effort going into technological development today is small in comparison to what it took to set up the first international emergency call frequency 406 MHz.

This frequency was initially available only to ships, because the emergency transmitters were large beacons mounted on the ship's deck. These beacons are called EPIRBs (Emergency Position Indicating Radio Beacons) and are triggered by water contact such as when a ship is listing or sinking. Initially, these beacons were connected to GPS (which was permitted for civilian use in the 1980s), but sent their emergency calls with MMSI to dedicated satellites, which were launched into space for this very purpose. From these satellites, the distress calls were forwarded to one of the more than 40 receiving stations, called LUTs (Local User Terminals), which are spread out over the globe. The LUT then forwards the emergency call to the nearest MRCC, of which more than 40 stations also exist worldwide. From here, whatever RCC (Rescue Coordination Station) was closest to the scene of the accident and where the SAR initiated the rescue was alerted.

This is a rather complex chain, but even for ships that find themselves in distress alone on the high seas, this is the only system, even today. As horizontal radio transmission is limited by the many aforementioned factors, emergency calls must be routed via satellites in order to reach over the horizon. In the open ocean, the signal may have to travel several thousand kilometres.

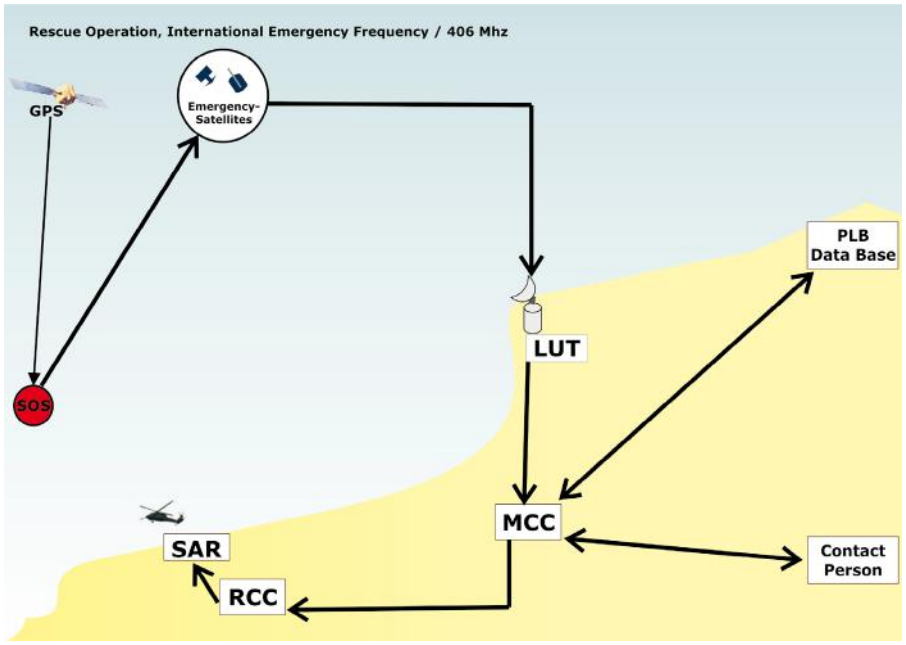
PLB

Over the years, the EPIRB has become smaller. Today, such transmitters can be mounted on the wall and are no longer installed on the deck. Personal emergency transmitters, which were attached to life jackets and clothing, were introduced. They are called PLBs (Personal Locator Beacons) and also work on the 406 MHz frequency, on the same principle as the EPIRB. For divers, there are depth-rated models in underwater housings, which first have to be opened at the water's surface in order to raise the alarm in the case of an emergency.

For decades, 406 MHz was the only rescue frequency for ships, and MOB, the only chance of rescue. Right from the onset, this system was also plagued by false alarms, both due to technical problems and to improper handling.

In order not to block rescuers and to quickly establish whether the alarm is real or false, two additional steps have been built into the rescue chain. First, each PLB is kept in a database, with the name of the owner and the contact details of another person who knows the owner (emergency contact). Second, in case of an emergency, this designated person will be contacted by the MCC to confirm that the sender is actually at sea.

This protocol should ensure that genuine emergencies are verified as such and passed immediately on to the RCC and SAR. It may appear a bit complicated, but it only adds a



few minutes to the response time, which is worth the while in order to prevent initiating unnecessary rescue operations in the case of false alarms.

A BLESSING AND A CURSE

It is a blessing we now have technology that makes it possible to respond to and rescue people in distress even over long distances. Large thanks are owed in particular to the sea rescue services and their members, many of which are volunteers, who often risk their own lives to help others. Their heroic attitudes cannot be commended often enough.

A salient point must therefore be made that personal safety at sea cannot be viewed as just yet another product category of equipment, which can be purchased and some of which are produced primarily for the sake of making a profit. There are some real issues and limitations to consider as well as the occasional misleading information or overreaching marketing pitches to weed out, which is not easy considering the complexity of the matter.

As divers, we just seek to safeguard ourselves from being lost at sea. Fair enough. But in doing so, we still have the primary responsibility for our own safety. First of all, that means taking every reasonable precaution to ensure we do not end up in such a predicament in the first place, and not relying on having a personal safety device to call in a ride home to safety.

It is basic, sound principle that we should never rely on delegating any degree of responsibility for our own safety to other people – it is plainly wrong, and dangerous. And this goes for the purchase and use of safety devices too. Any distress calls made will, to various degrees, either inconvenience other people or put them at risk. We owe it to them – and to our loved ones – to make sure we understand the design, technical features and proper use of these devices, as well as the implications if we do not. Should we one day have to raise the alarm for real because we, despite our best efforts, end up in a perilous situation, we should be able to correctly use and rely on a system that has been created to save our lives.

FACTFILE

TESTING FOR LED INTERFERENCE

LED lights may interfere with VHF radiotelephone, AIS and DSC devices. The US Coast Guard has issued a "Marine Safety Alert" regarding the potential interference of VHF-FM radio and AIS reception from LED lighting. It has quite recently been found that LED bulbs may emit interference in the same frequency of the aforementioned radios. Although the jury is still out and there is no solid scientific results yet, skippers are urged to conduct a test to find out if their on-board radios are also compromised.

Nonetheless, it may be possible to test for the presence of LED interference by using the following procedures:

1. Turn off LED light(s).
2. Tune the VHF radio to a quiet channel (e.g. Ch. 13).
3. Adjust the VHF radio's squelch control until the radio outputs audio noise.
4. Re-adjust the VHF radio's squelch control until the audio noise is quiet, only slightly above the noise threshold.
5. Turn on the LED light(s). If the radio now outputs audio noise, then the LED lights have raised the noise floor. (The noise floor is generally the amount of interfering signals or static received beyond the specific signal or channel being monitored.)
6. If the radio does not output audio noise, then the LED lights have not raised the noise floor.

If the noise floor is found to have been raised, then it is likely that both shipboard VHF marine radio and AIS reception are being degraded by LED lighting.

UNDERWATER MACRO PHOTOGRAPHY WITH THE SONY A7RIII

FEATURE AND PHOTOGRAPHY **DR SIMON J PIERCE – WWW.OCEANTRIPPER.COM**

A trip to Tulamben in Bali gave me a few days to test and refine my gear configuration for macro, so I thought it'd be useful for Future Simon – and hopefully you too – to write up some notes on underwater macro photography with the Sony A7RIII camera, Sony 90 mm macro lens, and Nauticam NA-A7RIII housing.

Mads and I just finished up a few days of muck diving at Scuba Seraya Resort near Tulamben in Bali – which I highly recommend. The trip gave me a few days to test and refine my gear configuration for macro, so I thought it'd be useful for Future Simon – and hopefully you too – to write up some notes on underwater macro photography with the Sony A7RIII camera, Sony 90 mm macro lens, and Nauticam NA-A7RIII housing.

This is my third macro stint (following Nosy Sakatia in Madagascar and Mafia Island in Tanzania last year) with my new(ish) Sony system after several years of using micro 4/3 cameras. I'm starting to figure out what works best – for me, at least.

EXPOSURE SETTINGS

My default settings are 1/200 sec, f/16, and ISO 200. My Sea & Sea YS-D2 strobes are set on 22. I shoot with both the camera and strobes in manual modes. I've tried to increase my depth of field by using f/22 (and ISO 200, 1/200 sec) but the resulting photos were noticeably less sharp than at f/16, presumably due to diffraction.

To get a correct exposure at f/22 I also had to bump the strobe power up to their maximum, 32, which made the YS-D2s unhappy if I was taking several shots in a row. One of the strobes started flashing at me at one point, then stopped working – I presume it overheated. It was fine after I turned it off and gave it a short rest.

I wish the camera had a faster strobe sync speed – Sony advertises 1/250 sec, but it turns out that only works for certain high-powered flash systems. Dagnabbit. It would be nice to eliminate or minimise ambient light through a faster sync speed.

DEALING WITH CRAPPY AUTOFOCUS

The Sony 90 mm is notoriously slow to focus. This is definitely a thing, but you can deal with it. First, set the focus limiter on the lens to 28-50 cm. That helps. Setting the focus mode to AFS and "release priority" might help a bit more. Ultimately I've started using the DMF focus mode – Direct Manual Focus – which is super useful. There is a great explanatory video by Mark Galer (my main guru for Sony camera settings).

Check it out here: **https://bit.ly/2KJ6aDb**

To get the best use out of DMF, decouple the shutter from autofocus. I've set my A7RIII to back-button focus using the AF-ON button. The dedicated thumb lever that Nauticam has on the housing makes this easy to use. When you press the AF-ON button with the lever, the camera uses AFS autofocus to get close(ish) to the correct focal plane. Once it's in the correct neighbourhood, you can release the button and use focus peaking to get the exact focus you need by moving the camera forward and back slightly.

What's focus peaking? It's the best thing ever.

I've set my peaking level to High, and red in colour. The LCD (or EVF, if you use it for composition) will then highlight everything that is in focus with a red fringe. The depth of field at f/16 is really thin, so the peaking makes life far easier. Frankly, I'd find the 90 mm extremely frustrating to use without this focus aid.

I do own the manual focus gear for the 90 mm, but I didn't bring it to Indonesia because it takes up bag space. I thought DMF would be sufficient. That might have been a bad call. In practice, it's really hard to find the minimum focus limit using DMF. Some of the nudibranchs we found (and when I say "we", I mean our guide or Mads, I'm useless) were teeny, so it would have been really useful to be able to quickly set my focus distance to 28 cm.

Next time, I'll try assigning the AEL button to AF/MF toggle, setting MF to the true minimum focus distance using the gearing, then toggling to DMF if I want to change the working distance. I'll update my post once I've tried that. If that doesn't work, I guess I'll have to start using a focus light.

Mark Galer did another video on speeding up low-light autofocus for Sony systems, which I found useful while I was working out the above settings.

You can watch it here: **https://bit.ly/2Pew8D8**

CUSTOMISING THE CAMERA

I tend to set the camera up for the specific shooting requirements I need for different projects. I've set all the above to memory recall 2 on the camera, although it doesn't save button assignments. Aside from the above, there are a couple more customisations I make for macro:

- I tend to accidentally hit the movie lever quite a lot while I'm moving around, so I've turned the movie recording function off (I wish that button could be reassigned, but it can't) when I'm not in movie mode.
- My AEL button is set to ISO at present, but see above – I may change this around, as I don't alter ISO often during macro work, and I can still use the direction pad for direct control if needed.
- I've set C3 to switch manually to "Super 35" (= crop sensor, APS-C) mode, which is a 1.5x digital zoom, as a budget supermacro. I only used it a couple of times at Tulamben, but it can make it easier to get exact focus and composition with particularly tiny subjects. The files are still 18 MP with the 1.5x crop (the joy of a high-resolution sensor), so they remain eminently usable – the lens becomes, effectively, a 135 mm macro.

At some point I'd like to buy the Nauticam SMC-1 for some true supermacro. But I digress.

Anyway, that's all very geeky, but macro is super fun! It's totally worth geeking out over. Hope this all helps someone out there… if you've got any questions or suggestions, I'd love to hear from you in the comments of: www.oceantripper.com/underwater-macro-photography/

"Ia Orana e Maeva i Tahiti"(1)
THE ISLANDS OF TAHITI

FEATURE **CHRISTELLE HOLLER** PHOTOGRAPHY **RODOLPHE HOLLER**

A boat is the perfect way to travel around the islands of Tahiti. French Polynesia is a fabulous place for nature lovers both on land and under the water.

Although we have been living in Tahiti for 20 years, it is always magical to travel and discover new islands out of the 118 scattered on a territory as large as Western Europe. A boat is the perfect way to travel around the islands of Tahiti. French Polynesia is a fabulous place for nature lovers both on land and under the water. Providing our services as liveaboard dive guides on mega yachts for VIP clients, here is one of our stories.

The cruise was scheduled in September for a couple of weeks aboard a 45 metre motor vessel, travelling through the Society Islands and some of the Tuamotu atolls, North East of Tahiti, the country's main island. The charter guests were both interested in diving and visiting unspoiled areas.

Our first stop was Moorea, Tahiti's sister island, only 10 miles from Tahiti. Arriving in Moorea is very special. Opunohu Bay has been protected from any building construction and offers the greatest scenic view with high sharp mountains and lush green rainforest. Going through the pass to anchor in the middle of the bay brings you back to 1769 when Captain Cook arrived there aboard the Endeavour after having sailed the oceans for months. Imagine the traditional outriggers coming to the ship with singing tanned Tahitians, paddling and greeting white men for the first time in history after having been totally isolated for centuries.

We got ready for our first shark dive in the ocean with the guests to see the 3 to 4 metre long lemon sharks swimming on the bottom outside of the pass. The dive spots are usually between 50 and 100 feet deep and when in the ocean, always very close to the reef. Tahiti is so isolated from any main land that fish aggregate around the islands like an

oasis in the desert. Our dive guide, Rodolphe explained that sharks were protected and that we were likely to see up to 10 different species of sharks throughout the trip. It was thrilling and yet our guests had no idea what was about to happen…

Getting back to the tender, Rodolphe saw a humpback with her calf in the distance. We couldn't believe it and got really excited. As a licensed operator, he gave the pilot very strict instructions on how to approach the whales carefully and explained that if they were resting, we could consider snorkelling with them. We waited a few hundred feet away while Rodolphe was saying this was our chance to live a once in a lifetime experience and get incredible shots. We put on our snorkelling gear and slowly went into the water. The most magnificent scene was before our eyes. The calf was cuddling his resting mother. Then he slowly started going up to the surface to breathe and came so close to each of us, definitely watching us, that we were all breathless from the emotion. The show went on for a while and we were all speechless as we headed back to the tender!

Well, this was quite the start of a cruise! Our next stop was Bora Bora where we sailed overnight passing the islands of Huahine and Raiatea and Tahaa. We did a couple of great dives encountering blacktip and grey reef sharks, eagle rays and many other fish. Some guests chose the option of going fishing with a local fisherman and brought back a beautiful mahi-mahi, which made part of dinner that night. A wonderful barbecue dinner had been prepared for us on a private motu[2] with a colourful traditional dance and fire show. The atmosphere was unreal. It felt a bit like we were having a special party with Christian

Fletcher and the crew of the Bounty.

We left Bora Bora during the night. The guests preferred to spend some more time at one of the luxury resorts of the island and chartered a plane to Rangiroa the following day to meet the boat there and not bother with the long crossing.

After a 17 hour sail to Rangiroa, in the Tuamotu archipelago, we were greeted by huge bottle nose dolphins swimming along the ship in Tiputa pass. We anchored close to the pass in the lagoon. Considered as world class diving, Rangiroa is the second largest atoll in the world. During our dive, not only were we lucky enough to dive with sharks (we also saw a great hammerhead and a sailfish), but also with a dozen dolphins playing around us while drifting through the pass. The dolphins live there year-round and like to come and greet the divers. A couple of them even came so close to us, stopping in front of the divers, that they could have been cuddled! This is a very unique phenomenon.

The visibility is always excellent in French Polynesia. Although accessible to any kind of diver, a pass can be unpredictable with the various currents and it made the guests

realise how important it was to dive with an experienced guide. We spent our last day at the blue lagoon (a small lagoon within the lagoon) enjoying a Tahitian picnic on a coral white sand beach shaded by coconut trees and aito[3] with a light blowing tropical sea breeze. Meanwhile, the Chef was getting some provisions in thanks to one of the daily flights from Papeete. Indeed, the atolls are definitely not a good place for shopping addicts! However, anything is available in Papeete and can be flown in within 24-48 hours even to some of the most remote of islands.

On the way to Fakarava, we stopped on the unspoiled atoll of Toau. Excellent dives, great spearfishing and surfing all day long and in the evening, we were taken to a secret place where we set traps with fresh coconuts cut open to attract the shy but incredible coconut crabs (they can weigh up to 20 pounds). Having no predators, some brown boobies had nested on the ground and the chicks were looking at us out of curiosity, showing no fear at all. The younger guests were amazed to see the birds allowed them to approach and look at them close-up. After dinner, we went back ashore, in the bush, with torches and saw lots of small hermit crabs and huge blue coconut crabs. They live on land and feed on coconut flesh.

Everyone felt like castaways on a tiny piece of land in the middle of the Pacific Ocean.

Our last destination was Fakarava. Our Captain anchored close to the small airport near the North pass. Fakarava and the surrounding atolls are a UNESCO classified biosphere. Diving the pass in the incoming current was fabulous. We passed close to grey reef sharks, schools of barracudas, went down to Ali Baba's Canyon, sheltered from the current and enjoyed watching the fish go by above us. However, our best time in the water was in the South Pass. The tiny village is cut from the rest of the world with only a handful of inhabitants. The pass is narrow and shelters hundreds of grey sharks. All kinds of beautiful tropical fish were in the lagoon as we snorkelled amongst them, including huge friendly Napoleon wrasses and sea turtles feeding on small sponges stuck on coral pieces. Some of the guests went surfing as well as the swell was good while the others went to a pearl farm to discover the art of grafting the black pearl oysters which make such precious pieces of jewellery. On our last day, we took a tender ride to nearby islets offering fabulous light pink sand beaches due to the colour of the seashells. One of them hides a very old skeleton and one could think to be on a secret treasure island, far from it all…

This brought us to the end of a marvellous trip for both crew and guests. On the way to the airport, the guests watched for a last time the unreal crystal clear water of the lagoon before getting on the plane. They promised to be back soon to explore further untouched and uninhabited islands. Mauruuru[4] Tahiti!

INFORMATION
The Islands of Tahiti are officially called "French Polynesia". It has been a French territory since 1842 and the inhabitants hold French passports. It is a very safe country to travel to. French and Tahitian are the official languages but English is understood and spoken in many places.

French Polynesia prioritises ocean conservation. Sharks are protected and the country has become a sanctuary for marine mammals since 2002. Although dolphins can be encountered any time of the year, humpback whales migrate to French Polynesia between July and November, the peak time being September and October. Whale watching in Tahiti requires to be coordinated through a licensed operator and snorkelling with the whales is possible under certain conditions.

Tahiti, the main island, is well developed and is definitely the place for re-fuelling and provisioning. Basically, any food request is possible with great quality products. The modern general hospital hosts a couple of new decompression chambers with specialised doctors.

There are nice opportunities to discover Polynesian culture around the various islands and the locals are happy to share their traditions with visitors.

The opportunities for diving in the country are huge and spread over 5 different archipelagos all offering a wide diversity of marine life and types of different sceneries.

Tahiti is also a developing destination for superyachts and welcomes about 60 of them every year both private and chartered. It is recommended to discover the islands by boat for the best dive experiences, including secluded areas.

TAHITIAN DIALECT
(1) Hello and Welcome to Tahiti
(2) Islet – always located in the lagoon and usually close to the reef
(3) Local pine tree
(4) Thank you

SAMPLE ITINERARY:
Days 1-3: Moorea
Days 2-4: Bora Bora
Day 5: Crossing from Society Islands to the Tuamotu
Days 6-9: Rangiroa
Day 10: Toau
Days 11-14: Fakarava

HOW TO GET TO TAHITI FROM DUBAI:
The easiest way is to fly to Auckland, New Zealand (daily flights from Dubai) and then direct to Tahiti International Airport.

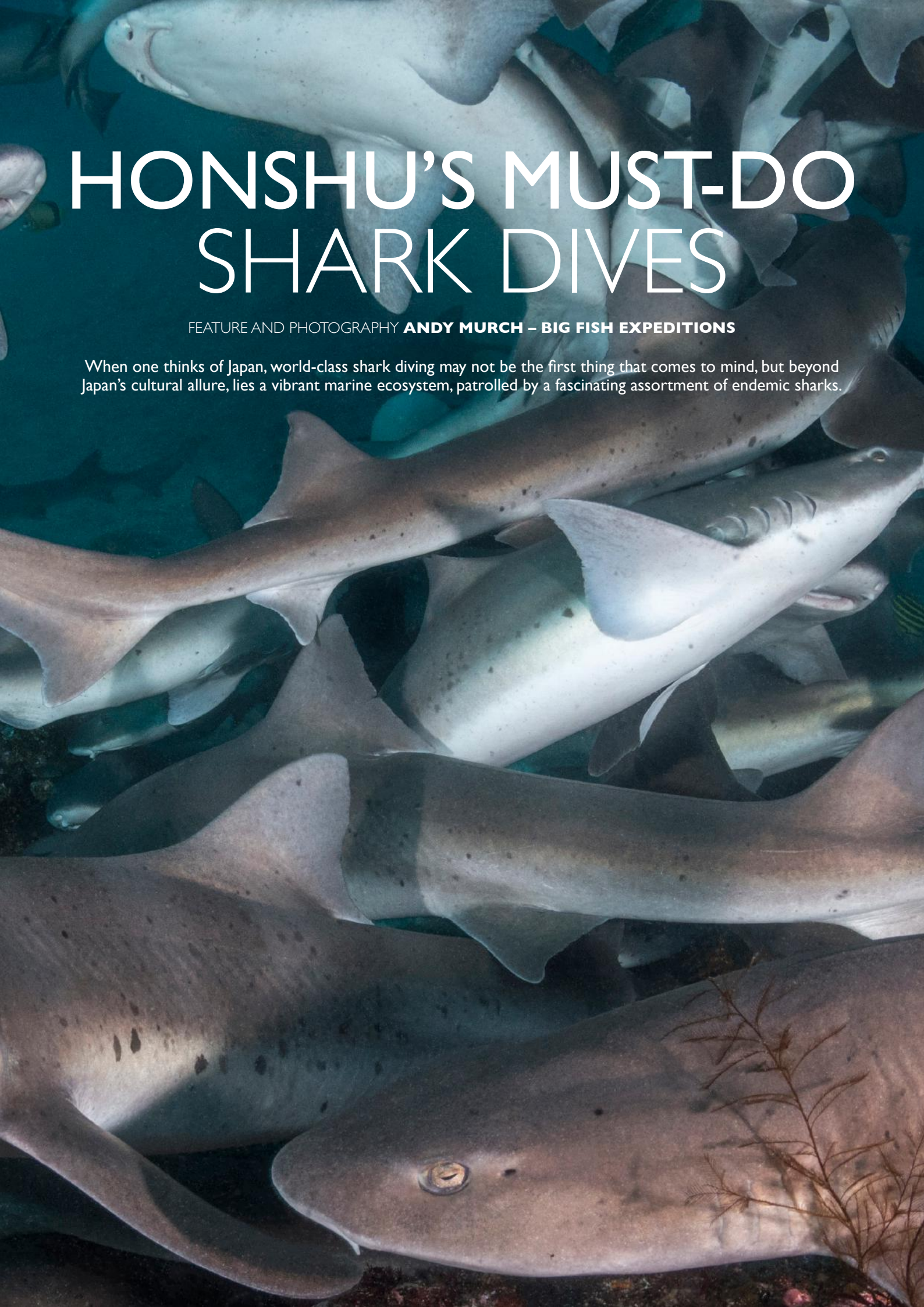
TAHITI PRIVATE EXPEDITIONS:
FB/Instagram: Tahiti Private Expeditions
Contact: Christelle Holler
Email: tahiti-private-expeditions@mail.pf
www.tahiti-private-expeditions.com

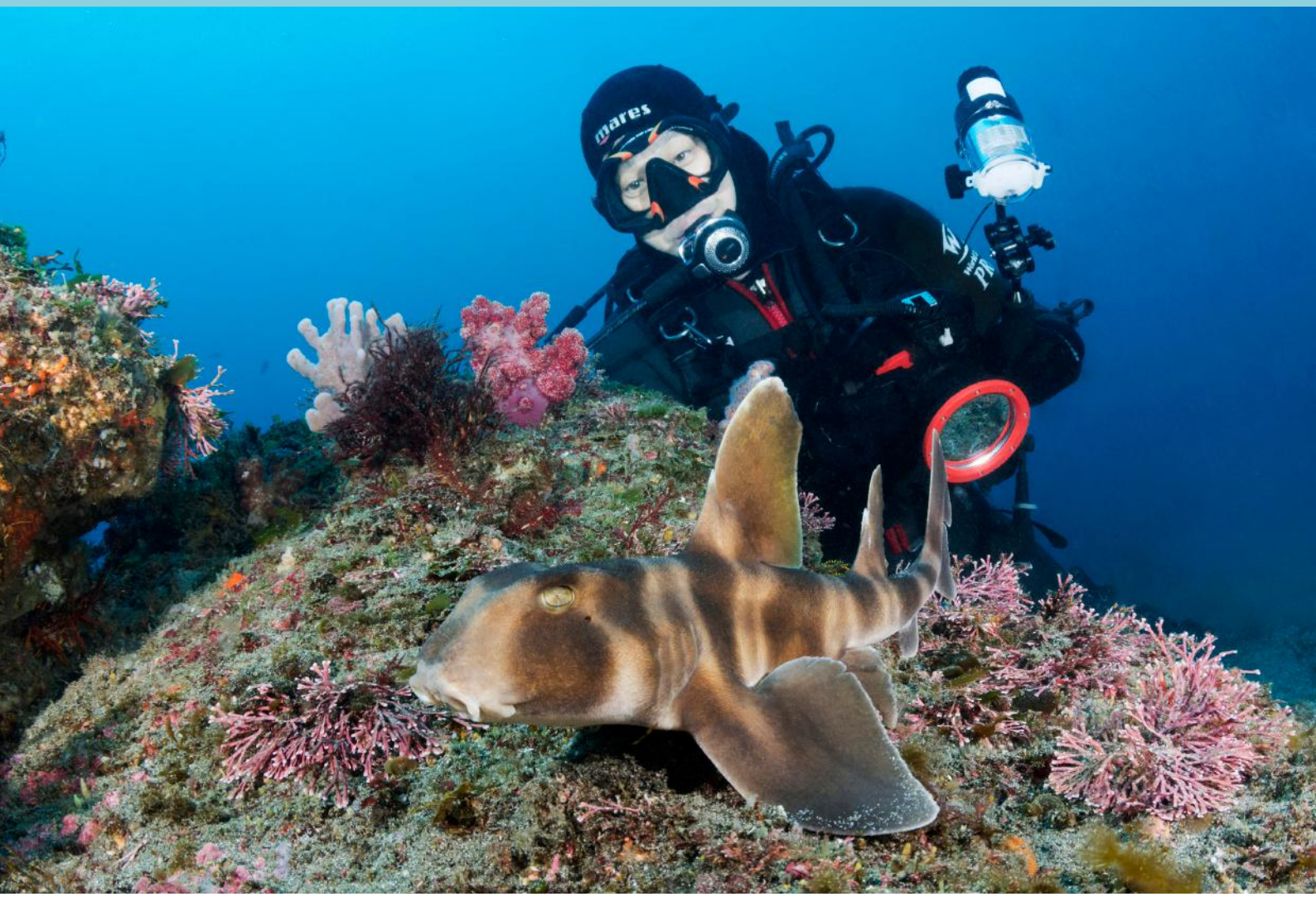
At Shark City, hundreds of sharks show up for lunch each day.

HONSHU'S MUST-DO SHARK DIVES

FEATURE AND PHOTOGRAPHY **ANDY MURCH – BIG FISH EXPEDITIONS**

When one thinks of Japan, world-class shark diving may not be the first thing that comes to mind, but beyond Japan's cultural allure, lies a vibrant marine ecosystem, patrolled by a fascinating assortment of endemic sharks.





TOP: Japanese horn sharks are quite common on the reefs near Shark City. **BOTTOM L-R:** Beautifully patterned banded houndsharks can be seen at no other location and the star-spotted smoothhound shark. **OPPOSITE PAGE:** Tateyama's reefs are covered in vibrant soft corals. **BOTTOM:** By the end of the feed there are more sharks than water!

When one thinks of Japan, world-class shark diving may not be the first thing that comes to mind, but beyond Japan's cultural allure, lies a vibrant marine ecosystem, patrolled by a fascinating assortment of endemic sharks.

The Japanese archipelago stretches from chilly Hokkaido Island in the northeast, to tropical Yonaguni Island in the southwest. Dominating the centre of the chain lies Honshu Island; Japan's largest landmass.

In the summer, Honshu basks in the warmth of the Philippines' current, but in the winter, icy cold water pushes down from Russia, lowering temperatures by a whopping 30°C. Honshu's fish species have evolved to tolerate the extreme temperature fluctuations, so it is not unusual to see endemic butterfly fishes swimming next to rockfish that one would expect to find in the arctic. Not surprisingly, Honshu's sharks and rays are just as diverse. Many are found nowhere else on the planet.

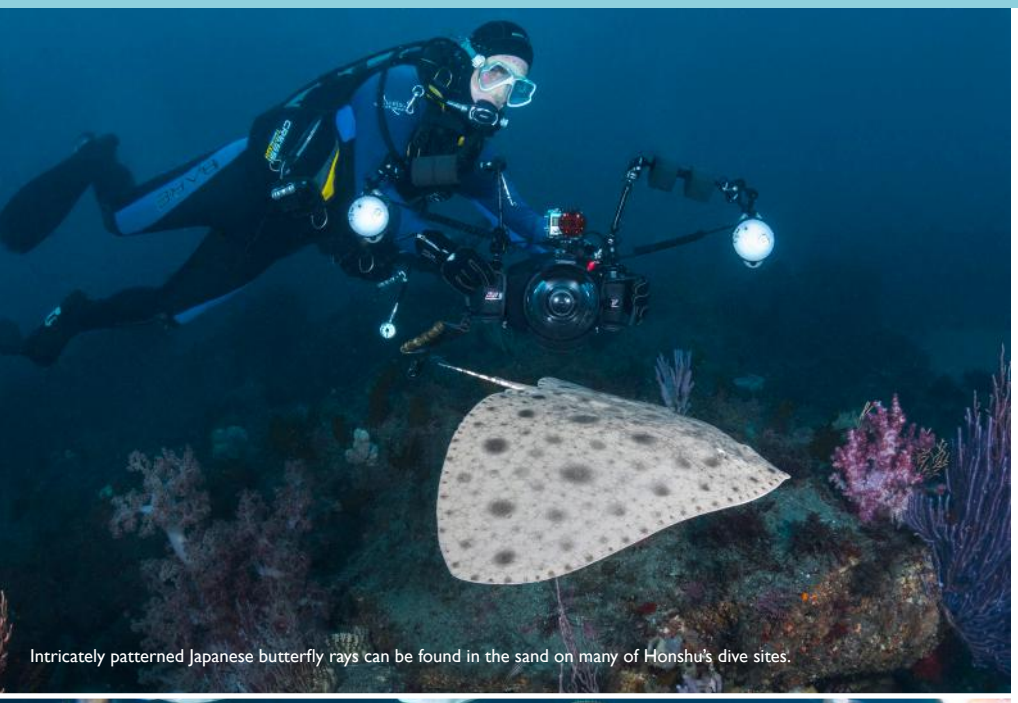
Although endemic sharks can be seen virtually anywhere around Honshu Island, there are a couple of locations that should not be missed by visiting shark fans. At a dive spot called 'Shark City' near Tateyama in southern Chiba, hundreds of banded houndsharks gather each day to enjoy a free lunch, compliments of Bommie Dive Centre. Banded houndsharks are a locally common but extremely elusive species that is virtually impossible to encounter elsewhere. The sharks are roughly a metre

long, greyish-tan above, pearlescent below, and beautifully patterned with small black flecks, scattered over subtle dusky saddles.

The houndshark feed takes place in 20 m of water, just a few minutes boat ride from shore. Before the dive, participants receive a thorough briefing by dive shop owner Kan Shiota; a friendly, English speaking dive instructor, and the visionary who turned a regular reef diving spot into a bucket-list destination for shark lovers.

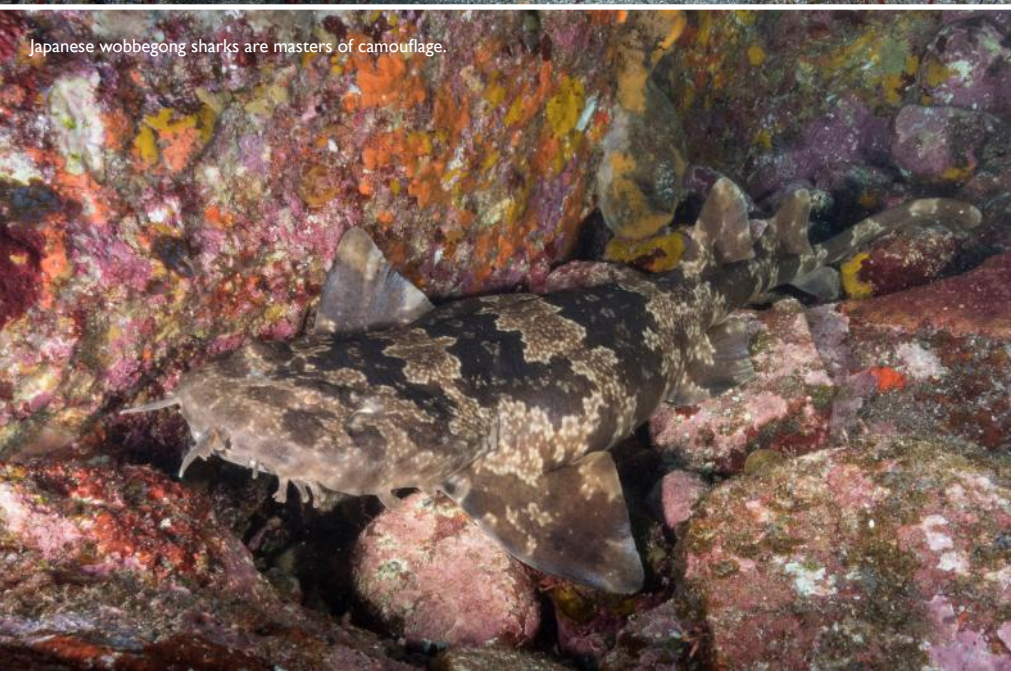
Upon descending, divers are immediately greeted by a layer of sharks, milling around on the dark volcanic sand while they await the arrival of the shark feeder.

Kan brings down a basket of frozen fish, which he tethers to a rock. As if on queue, the closest sharks switch gears and bolt towards him. Unfazed by their enthusiasm, he cracks open the crate and offers a handful of fish to the nearest pint-sized predators. As he doles out his fishy treats, more sharks arrive, wriggling and tumbling over each other in an effort to consume their share. There are so many sharks that Kan sometimes disappears in the centre of the swarm. Clearly not claustrophobic, he continues to guard the bait crate, even though at times there are more sharks than water.



Intricately patterned Japanese butterfly rays can be found in the sand on many of Honshu's dive sites.

Blotchy swellsharks are rarely seen by divers.



Japanese wobbegong sharks are masters of camouflage.

Eventually Kan rises theatrically out of the centre of the maelstrom, leading the swirling mass of sharks upwards as he does so. The result is an enormous twister of sharks that looks like a scene from the movie 'Sharknado'.

Among the houndsharks, visiting divers can also see hundreds of red stingrays; another species endemic to this part of the world. The rays are just as eager as the sharks; pushing their way into the centre of the feed.

The spectacle usually lasts around 30 minutes. While it unfolds, divers have plenty of opportunities to take hundreds of images or simply to look on entranced, until their dive computers force them back to the surface.

Although Shark City is a commercial enterprise, it also has an important environmental value. Before Kan arrived, the banded houndsharks were a nuisance to local fishermen, causing damage to their nets. To avoid losing their catch, the fishermen were sometimes forced to kill the sharks, so Kan wanted to see if he could draw the sharks away from danger by feeding them.

Unfortunately, the banded houndsharks turned out to be as timid as they were beautiful. They would not come anywhere near him, even if he carried bait. Unperturbed, he tried leaving the bait on the seafloor and returning to the boat until they had consumed it. That seemed to work, so he repeated the process over and over, until the houndsharks finally got used to him being in the water with them.

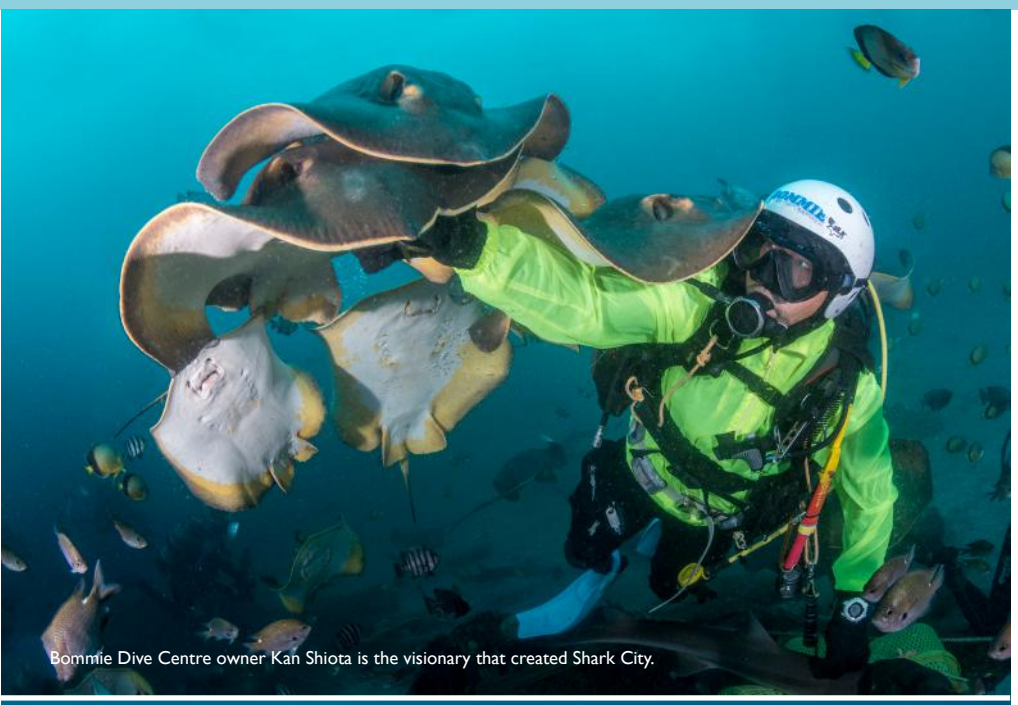
Eventually, they got used to groups of divers too, but it took five long years for Kan to completely habituate them. Now, Shark City attracts hundreds of houndsharks every day and is a big hit with local divers.

Banded houndsharks are not the only cartilaginous predators to call Tateyama home. If you get tired of Shark City, the adjacent reef is a great place to search for Japanese horn sharks; a beautiful endemic species with zebra-like vertical stripes and two large dorsal fins equipped with menacing-looking fin spines.

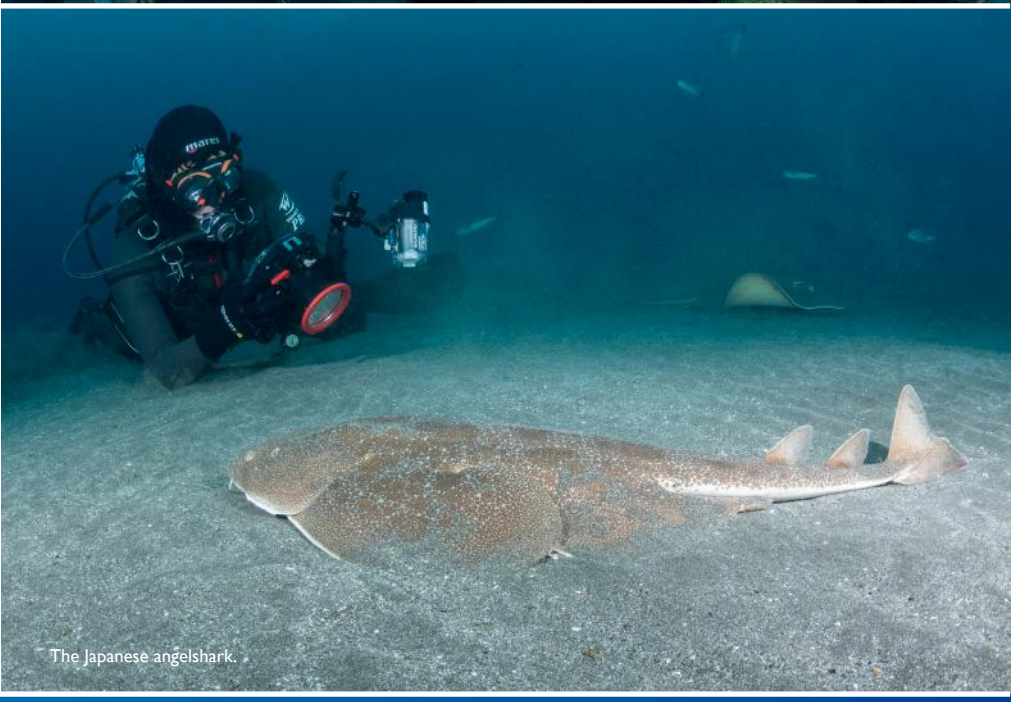
Unlike their banded cousins, horn sharks are bottom dwellers that hide within crevices in the reef. Once located, they generally stay put, allowing divers to get a very close look at them.

While exploring the reef structure, it is also a good idea to keep one eye on the sand, where endemic Japanese angel sharks and exquisitely patterned Japanese butterfly rays can sometimes be seen hiding in plain site.

Chiba's Shark City is a year-round destination, but it is best to visit some of southern Honshu's shark diving spots 'in-season'. For example, during September and October, schooling scalloped hammerheads congregate



Bommie Dive Centre owner Kan Shiota is the visionary that created Shark City.



The Japanese angelshark.

Large schools of scalloped hammerhead sharks can be found at Mikomoto Island during September and October each year.

around tiny Mikomoto Island at the southern tip of the Izu Peninsula.

Touted as Japan's mini-Galapagos, Mikomoto is an exposed, barren islet, topped by a forlorn looking lighthouse. What it lacks in terrestrial charm, Mikomoto makes up for in big animal activity. Its remoteness, relatively strong currents, and proximity to deep water make it a magnet for pelagic sharks, including hammerheads, grey reef sharks and oceanic blacktips.

If you've already ticked those sharks off of your life-list, then you may prefer to visit Mikomoto during the winter months when Japanese angelsharks and cloudy angelsharks are in residence.

Another of Japan's endemic shark species that visits Mikomoto is the Japanese Wobbegong Shark. It is strange to find a wobbegong this far north because all other members of the family live in the southern hemisphere, but local divers that are prepared to brave Honshu's winter temperatures, often see dozens of these odd looking sharks lounging on Mikomoto's colourful reefs.

Cryptically patterned and adorned with facial skin flaps that obscure their mouths, Japanese wobbegong sharks are masters of camouflage and expert ambush predators. They are capable of remaining motionless for many hours, blending into the reefscape until an unsuspecting small fish swims within striking distance of their powerful jaws. Then, they lunge forward, mouth agape and clamp down on their victims with needle-sharp, snake-like fangs. There is no escape from the jaws of a Japanese wobbegong!

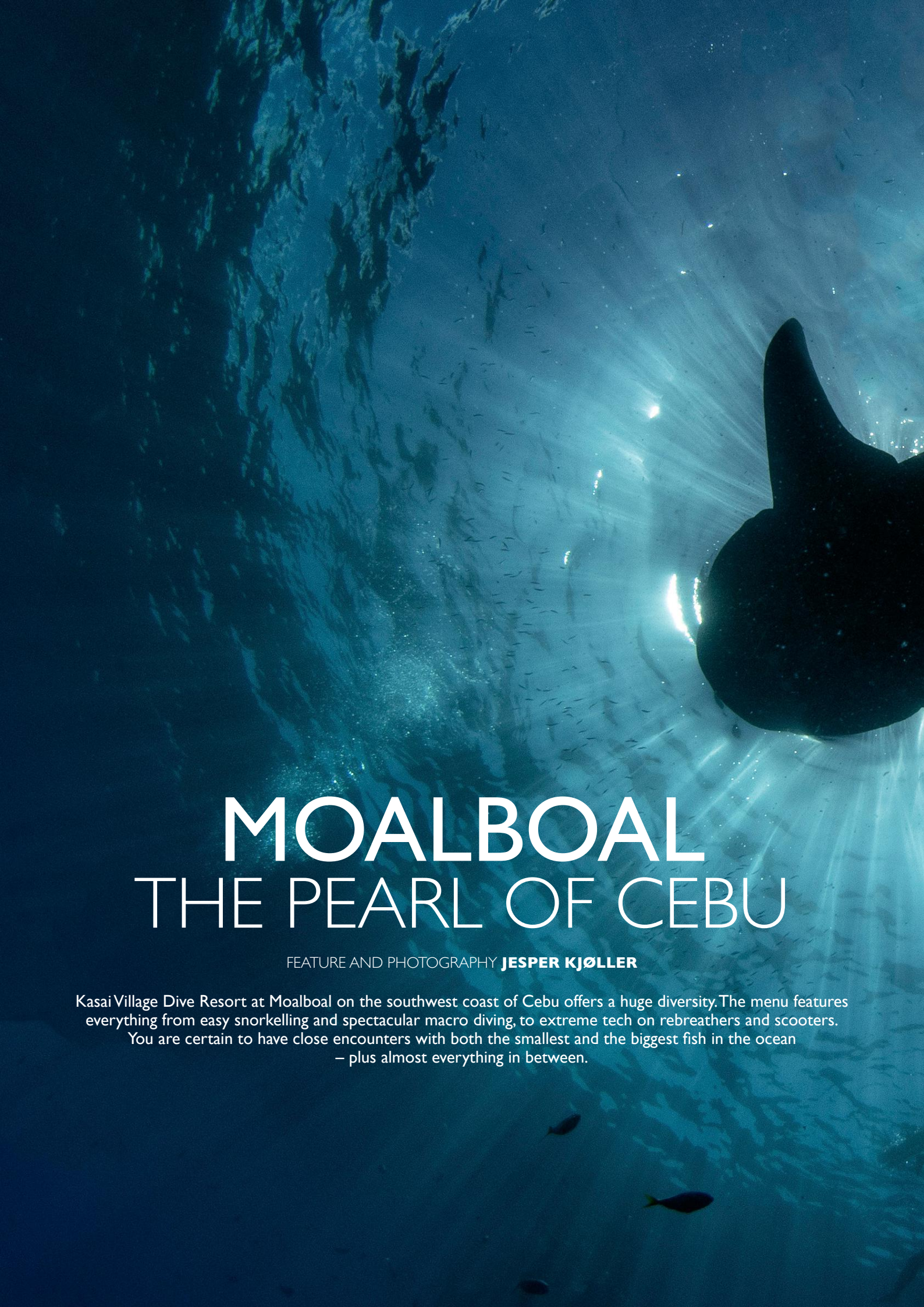
If you're extremely lucky, Honshu has even more endemic shark species that you could run into, such as the blotchy swellshark and starspotted smoothhound. Your chances of finding those two are pretty slim unless you dive year round but you never know. Either way, there are enough exotic predators in Honshu to keep even the most jaded shark diver entertained.

LOGISTICS

Tateyama and Mikomoto are both within driving distance of Tokyo. Getting there on public transport can be a challenge for foreigners, but it is possible to rent a car installed with an English language GPS.

Or, you can join a trip with Big Fish Expeditions who run yearly 'shark safaris' to dive with all of Honshu's endemic species.

Email: info@bigfishexpeditions.com
www.bigfishexpeditions.com



MOALBOAL
THE PEARL OF CEBU

FEATURE AND PHOTOGRAPHY **JESPER KJØLLER**

Kasai Village Dive Resort at Moalboal on the southwest coast of Cebu offers a huge diversity. The menu features everything from easy snorkelling and spectacular macro diving, to extreme tech on rebreathers and scooters. You are certain to have close encounters with both the smallest and the biggest fish in the ocean – plus almost everything in between.

ABOVE: The bait balls are always changing shape, so I shoot on automatic to accommodate for the shifting light conditions. **OPPOSITE PAGE:** The sardines moved from Pescador Island a few years back. Now they can be found just a few minutes boat ride from the resort.

Kasai Village Dive Resort at Moalboal on the southwest coast of Cebu offers a huge diversity. The menu features everything from easy snorkelling and spectacular macro diving, to extreme tech on rebreathers and scooters. You are certain to have close encounters with both the smallest and the biggest fish in the ocean – plus almost everything in between.

The reduced visibility is not caused by particles in the water column. In fact, the water is unusually clear today. The low visibility is caused by fish, millions of them. The enormous sardine bait ball continuously changes shape. Sometimes it almost gets completely dark when the huge school blocks out the sun.

I'm looking around for my wife. Where is Dorte? It is really easy to get lost in the tornado of swirling fish. Suddenly a large hole in the solid wall of sardines opens up and she rushes towards me with her scooter on full throttle. I know her body language quite well and I can tell she is having a blast. The school moves as if it were one large organism and the majestic scenery keeps changing. I shoot with the camera on automatic to accommodate for the constant shifting light conditions. With

my rebreather, I can dive under the sardines without disturbing them with exhaust bubbles and Dorte keeps finding new photogenic ways to position herself in the schools. I'm having a blast as well!

SAFETY IN NUMBERS

Moalboal is famous for the sardines. The colossal schools used to stay around Pescador Island, but a few years back they suddenly decided to relocate and are now hanging out close to the shore at Panagsama Beach, just a few minutes boat ride from our resort's jetty.

Nobody can explain why they have moved or why they stay, but the local government recognises the value of the sardines and protects them for the benefit of the tourist industry in the area. It is only allowed to fish the sardines by line. And many local fishermen now make money offering boat rides to snorkellers instead of catching the sardines. If they hook a sardine, they can only sell it once – but if the sardines are alive and well, the fishermen can sell them to the tourists every day.

The bait balls illustrate a biological concept known as safety in numbers. It is believed that predators are confused when approaching big schools of fish. By staying in formation, the sardines have an advantage because it is difficult to single out individuals.

Sardine is actually a common term describing a handful of different species in the herring family and there is a couple of separate schools at Panagsama with distinctive species and slightly different sizes, shapes and colours.

Many divers travel to Moalboal just for the sardines and they are definitely among the main attractions on the menu. But the destination has so much more than a can of sardines to offer the guests.

OPPOSITE PAGE: The Cathedral Cave whose entrance looks like a skull. **LEFT:** Denise pygmy seahorse (*Hippocampus denise*). **RIGHT:** Mandarin fish (*Synchiropus splendidus*).

THE SKULL CAVE

After a 20 minute cruise on Kasai Village Dive Resort's large and comfortable bangka (the traditional Filipino boat-type with bamboo outriggers added for stability), we arrive at Pescador Island, a small limestone outcropping a few nautical miles from shore. The area is a protected marine park and not very large. You could potentially circumnavigate the entire island in one single dive – if you hurry up. But, like the dive sites on the mainland, Pescador Island has plenty of caves, overhangs, cracks, and canyons, so you'll want to take your time to explore. It is a dramatic site with thriving coral gardens, lots of reef fish and plenty of interesting macro life. You need at least two dive days here to cover it thoroughly.

Felix, our most excellent and loyal local guide, briefed us before the dive and mentioned a Cathedral Cave. Always on the lookout for photogenic scenery, I liked the sound of that. We find the chimney-like structure and I swim in to evaluate the photographic possibilities. I'm completely surprised at the sight that meets me when I turn around and look out at the opening I had just been through. This is not a Cathedral Cave! This is a Skull Cave! If anybody ever contemplated producing an underwater version of the old The Phantom comic strip, this would be an excellent location for his lair. The two eyes are perfectly spaced out and below them, a large opening resembles the cavity where nose and mouth would have been. It is a magnificent sight and after a little direction, Dorte is perfectly positioned for the Skull Cave money shot.

LOW-CARB AND TWINSETS

Between dive activities, we are served three delicious meals in the airy restaurant on the second floor overlooking the coral reef outside. Kasai Village Dive Resort recently launched an LCHF-style menu option for followers of a low-carb diet. We opt for that during our entire stay and are impressed with the quality of the food. We are not really offered any choices, but basically surrender to whatever the chef prepares for us and not only is it healthy but always very delicious and satiating.

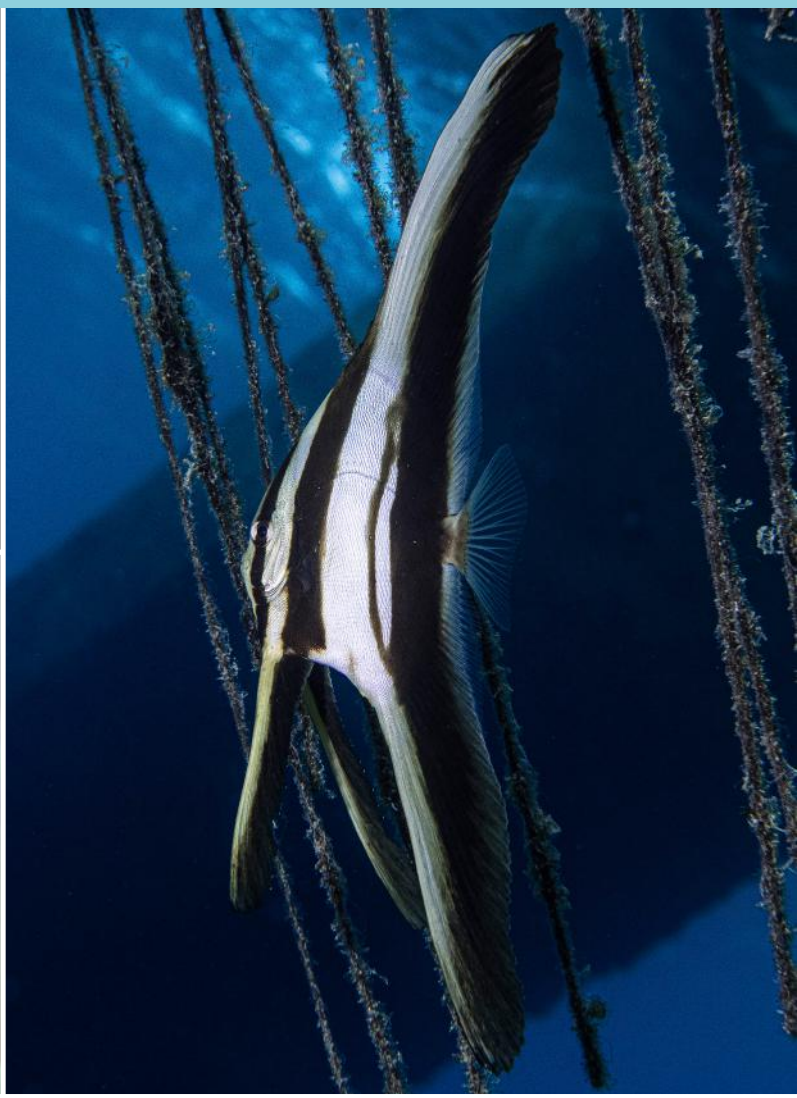
Having a nutritious breakfast and double espressos while enjoying the view of the neighbour island Negros on the other side of the Tanon Strait is a great way to begin the day.

Our dive boat waits for us at the end of the jetty, and the crew is busy loading tanks for the morning dives. Kasai Village Dive Resort supports every imaginable kind of diving, so we have booked twinsets in advance and we packed our double-wings, back plates, and regulators for that kind of set-up. We like being able to do long nitrox dives without worrying too much about gas supply.

KASAI WALL

Speaking of house reefs, the term is used loosely at many dive destinations. More often than not, it designates a dive centre's nearest site for conducting training or try dives. So, when it comes to Kasai Wall, house reef is a little bit of a misnomer – this dive site has everything! The reef at the end of the picturesque resort jetty soon becomes our favourite choice for a late afternoon or early night dive. You could easily spend the entire dive time just exploring the macro life in the shallow area around the end of the jetty. But since there is also easy access to a nice drop-off, we usually begin our unguided house reef dives by dropping down to 25-30 metres. The wall is covered with sea fans, sponges and whip corals. Kasai Wall also brags to having a selection of fan corals populated with several Denise pygmy seahorses (*Hippocampus denise*). These diminutive cuties are incredibly challenging to spot, and they jump from branch to branch when disturbed, so they are even harder to lock down in the viewfinder.

There is also a small colony of mandarin fish (*Synchiropus splendidus*) just at the edge of the drop-off and we try to time our dives to coincide with the sunset, where the mandarins come out to perform their mating ritual. By either ending our afternoon dive or begin our night dive around sunset, we manage to observe several mating events. A large sea turtle is usually resting on a ledge below the cluster of staghorn corals where the mandarins hide during the day.



OPPOSITE PAGE: Just a few of the macro inhabitants at Kasai Wall – one of the richest and most diverse house reefs I have dived. **ABOVE:** It is a glorious feeling to be able to spend time with the gentle giants at Oslob. You are almost guaranteed a close encounter here.

OSLOB

We wake up by the merciless noise of the alarm clock. It is 4:30am and we roll out of bed. I prepare cups of instant coffee while we get ready to leave our room. The minibus that is going to bring us to Oslob on the southeast coast of Cebu, is leaving soon and the crew is busy loading equipment, tanks, and provisions for the day trip. The kitchen staff has prepared nice breakfast boxes for us (still loyal to our LCHF-preference) and we eat the simple but delicious meal en route to Oslob. After a two-hour drive, we arrive at the site only to discover hundreds of others with the same intention as us – to dive with the whale sharks that congregate close to the beach. Luckily, the majority of the visitors are snorkellers or simply spectators that will stay dry in the small boats. As soon as we are underwater, it does not feel crowded at all and we spend two glorious long dives with the gentle giants.

The local fishermen were getting tired of the whale sharks destroying their krill nets and they started to feed them to keep the behemoths under control. The feeding created the basis for a much more lucrative industry: whale shark watching.

Every day between 9 and 11 a group of whale sharks show up expecting krill. Feeding wild animals is a controversial endeavour. But the enterprise is well organised and the animals are not harmed in any way. Sometimes when there is a lot of natural food alternatives in the water, the whale sharks opt for that and do not care for the fishermens' krill. They have a choice. Maybe I'm just trying to justify supporting a doubtful practice?

However, each day hundreds of people get an up close and personal interaction with the sharks. They learn about the animals and leave with an increased appreciation for whale sharks and that can only be good in the long run.

Michael Pettersson, the Swedish manager of Kasai Village Dive Resort has mixed feelings about the Oslob experience.

"6-7 years ago, before the feeding at Oslob were put into system, we would regularly see whale sharks passing by our house reef or Pescador Island. It still happens, but much less frequently. Oslob is a bit of a zoo, but many people ask for it and we are happy to take them there as it is a nice experience." he says.

CAVES

During our trip, I do a couple of deep rebreather dives with Michael. His dive centre is equipped for all sorts of technical diving and supports several rebreather models such as JJ-CCR, Poseidon Se7en and rEvo, and Michael is a very experienced Instructor trainer on several units. The logistics are also perfect for technical dive training with easy access to 50+ metres in front of the jetty.

Michael asked me if I would like to do a cave dive. I'm in! "We have to get up early in the morning as the dive must be aligned with the tide tables", he tells me. "If we do not time it right, the flow going inwards is so strong that it will be impossible to swim out again." The cave entrance is at the base of the Kasai Wall at 40 metres. I told you – that house reef has everything!

Michael is diving his side-mounted Liberty-rebreather, but after a few hundred metres of penetration, the cave begins to get too narrow for my back-mounted rig. We exit again before the tide starts to pull water into the cave. We spend 30 minutes of decompression at Kasai Wall enjoying the company of a school of juvenile batfish. It was an unexpected pleasure to be able to do a cave dive. Michael tells me that the area has lots of unexplored sea caves.

COPTON POINT

If there is one thing missing on Kasai's menu, it is wrecks. Even though Tanon Strait is quite a busy sailing passage, a sinking vessel would disappear at great depths outside the range for even the most advanced divers.

Kasai Village Dive Resort supports all sorts of technical diving and with deep walls right in front of the resort jetty, the location is perfect for tech training.

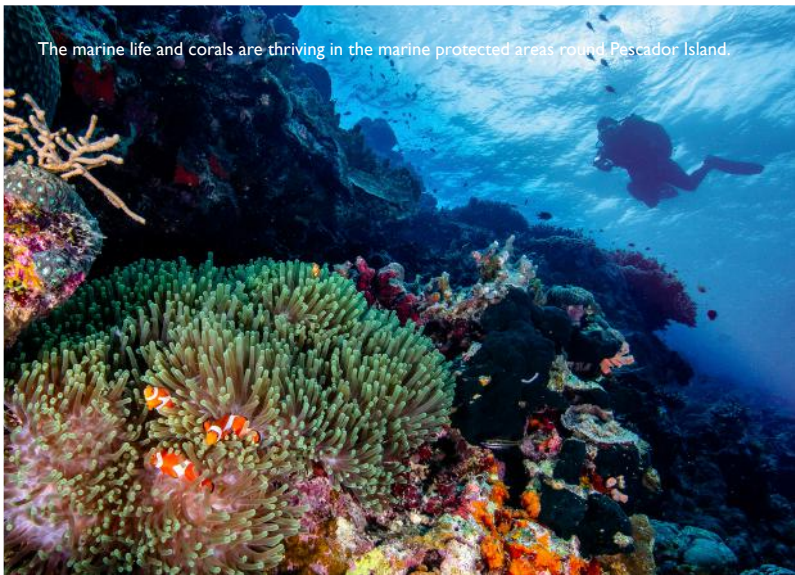
The Swedish resort manager Michael Pettersson rarely misses a chance to go on a tech dive. He invited me to explore the deep cave on the house reef, Kasai Wall.

Airplanes are always photogenic. This one was sunk on purpose to 22 metres at Compton Point in the mid '90s to compensate for the lack of wrecks in the area.

A painted frogfish (*Antennarius pictus*) hiding on the walls of Pescador Island.

There is an abundance of sea turtles in the area and we met them on almost every dive.

Huge barrel sponge on Pescador Island.



The marine life and corals are thriving in the marine protected areas round Pescador Island.

Well, there is actually one wreck. On the sandy bottom, situated at 22 meres on Copton Point, there is a fuselage from a single-engine Lancair plane. The plane was sunk somewhere in the mid '90s by local dive centres to offer an alternative to wall and macro dives. The area also supports an eel garden, and on the drop off next to the airplane, the gigantic fan corals are amongst the largest I have seen anywhere.

Michael Pettersson and his staff are always on the lookout to develop new dive experiences for the guests and during our stay I also had the pleasure of trying night dives with fluorescent light and black water diving, but that is a story for another time.

A dive destination is made up of various components. Obviously, the quality of the diving is important, but secondary parameters such as infrastructure, guides, accommodation, cruising distances to and from dive sites, variation in dive possibilities, and good service can make or break a diving holiday. Kasai Village Dive Resort ticks all the boxes and several more. The sardines alone are worth the trip, but with everything else thrown into the mix, Moalboal is hard to beat if you want a tropical dive vacation with great variation.

KASAI VILLAGE DIVE RESORT

Michael Pettersson is originally from Sweden where he worked as a manager for the cell phone giant, Ericsson. With a dive instructor background, he was put in charge of arranging dive trips for Ericsson's staff. By coincidence, he ended up in Moalboal with a group where he met his wife Lydia who worked as a secretary for the dive shop at the time. They moved back to Sweden for a few years, but when Ericsson was forced to reduce staff, Michael was offered a severance package that allowed him to get off the hamster-wheel and develop a piece of property in Moalboal into a dive resort. Kasai Village Dive Resort was born. That was 18 years ago.

Today the resort is well-established with guests coming to visit from all over the world. It is small and cosy, and the diving facilities are excellent with a large area for changing, storing and rinsing equipment, a spacious camera room and a spacious room for setting up rebreathers and other technical dive gear. The diving staff is very helpful and well trained. Many of them have worked for the resort for many years and that is always a good sign.

www.kasaivillage.com

TRAVEL FACTS

GEOGRAPHY: The Philippines includes over 7,000 islands with a total land area of 300,000 km^2. The eleven largest islands contain 95% of the land area. The archipelago is divided into three island groups: Luzon, Visayas, and Mindanao. Cebu Island is part of the Visayas group of islands in the central Philippines. The republic has a population of 106 million and many areas are considered to be overpopulated. Cebu has a population of 4 million.

TRAVEL: International flights to Cebu City are typically from Dubai or via Singapore. Kasai Village picks guests up from the modern airport and sorts out the 3-4 hour transfer by minibus depending on the traffic.

DIVING: The diving is fairly easy and accessible but will also satisfy even advanced tech divers. Water temperatures are usually between 27 and 30 degrees celcius.

SEASON: There are two seasons in Cebu – the wet and the dry. The warmest months are March through to October. The winter monsoon brings cooler air from November to February. Kasai operates year-round and seldom cancels dives because of the weather.

LANGUAGE: Many Filipinos speak excellent English and road signs are in English as well.

TIME ZONE: Singapore time, GMT+7. 4 hours ahead of the UAE.

ELECTRICITY: 220 Volt continental power sockets, so bring an adapter for UK style appliances and chargers.

HEALTH: The nearest recompression chamber is in Cebu City. The shortest route crosses a mountain ridge in the middle of the island, so the 7-hour drive along the coastal road is the only option. As always, the best prevention against decompression illness is to dive conservatively, breathe nitrox and stay well hydrated.

CURRENCY: PHP100 (Philippines Pesos) = AED7.20

VISA Tourist visas are granted upon arrival and you are charged an airport exit tax for PHP750 (AED55) when leaving the country.

COMMUNICATION Kasai Village has site-wide WiFi.

GET A LOAD O' KOMODO

KOMODO NATIONAL PARK

A UNESCO MAN AND BIOSPHERE RESERVE AND WORLD HERITAGE SITE

FEATURE AND PHOTOGRAPHY **ALLY LANDES**

It is most famous for being home to the last surviving population of wild Komodo dragons (around 3,000 of them) and for having one of the world's richest marine environments. There are over 1,000 fish species, almost 300 types of coral, 70 sponges, 14 species of whales, six turtle species, and even dugongs in this protected area.


BIROSTRIS
SCUBA JUNKIE
KOMODO
SCUBA JUNKIE KOMODO

Cabbage coral dotted in the forefront with pretty Lemon damselfish (*Pomacentrus moluccensis*) and what looked like they could be Yellowtail damselfish (*Neoglyphidodon nigroris*).

Komodo has been a dive bucket list destination for quite some time and with a little research, a plan quickly came together. The main highlight to doing this trip was to get in during the manta season, and June ticked all the boxes! I read good reviews that Scuba Junkie was a reputable operator and their newly established dive centre is in Komodo itself.

Indonesia's Komodo National Park, established in 1980, was declared a UNESCO Man and Biosphere Reserve in 1986 and a UNESCO World Heritage site in 1992. It is located between the provinces of East Nusa Tenggara and West Nusa Tenggara. Boasting a total surface area of 1,817 km (marine and land),it mainly comprises three larger islands – Komodo itself, Rinca and Padar, while the rest of the park is made up of smaller islands, seamounts and pinnacles. It is most famous for being home to the last surviving population of wild Komodo dragons (around 3,000 of them) and for having one of the world's richest marine environments. There are over 1,000 fish species, almost 300 types of coral, 70 sponges, 14 species of whales, six turtle species, and even dugongs in this protected area.

In the north of the park is the Flores Sea, fed by the Pacific Ocean, and in the south is the Sumba Sea which is fed by the Indian Ocean. These two massive bodies of water move through the park spreading nutrients, which creates a very rich marine world. The park is known for its currents which are a big part of why the marine life is so varied. The currents are responsible for keeping the water nutrients rich by means of the constant water movements. This is one of the reasons there is such a healthy manta ray population in the area. There is, however, no guarantee of seeing them.

The science behind the success of this marine park's health is truly quite remarkable. The Komodo National Park is located between two oceans whose temperatures work conjointly. The Pacific Ocean feeds the Flores Sea with warm clear water for 6 months of the year, whilst the Indian Ocean feeds the Sumva Sea with cold and nutrient rich water. These two contrasted conditions complement each other well and in turn they swap roles, so the south of the park gets the warm clear water and the north in turn becomes cooler.

The start of your diving adventure begins in the small fishing town of Labuan Bajo at the western end of the large island of Flores. This is the gateway to the Komodo National Park. Komodo Airport is located just 2 km from Labuan Bajo's centre (a 5-minute drive) with 4-6 daily flights arriving from Bali or elsewhere. Getting the flight arrival to coordinate with the dive centre's boat departure is a bit of a gamble. We flew with Nam Air (Sriwijaya Air) and they rescheduled our flights twice, flying both in and out, which meant there was some unexpected waiting around to do. Scuba Junkie can organise a pick-up for your arrival so you at least know exactly how much to pay to get you from A (airport) to B (Scuba Junkie




LEFT TO RIGHT: Reef manta ray (*Mobula alfredi*), Spotted eagle ray (*Aetobatus narinari*) with Denise, Green turtle (*Chelonia mydas*) and Crocodile fish (*Cymbacephalus beauforti*).

head office). We were advised to go and eat in the little Italian restaurant, La Cucina (the pizzas are great) which is a two-minute walk from Scuba Junkie's head office where you connect to catch the boat over to the resort. The restaurant is charming and has a nice view from the terrace (except for the construction going on next door) overlooking the harbour, and they have WIFI to pass the time. Make the most of the WIFI if you need to as you won't have any at the resort.

We rendezvoused with the other dive guests at the head office after lunch and all our bags were loaded onto a pick-up truck, and we followed on foot through a little alley way to the harbour to board the transfer boat en route to Scuba Junkie's Komodo Beach Resort which is an hour's scenic boat ride, passing beautiful lush green islands all the way.

On reaching the Komodo Beach Resort, you are greeted by the Scuba Junkie staff who come to help carry your bags over and get you settled in the lounge area where you can enjoy a cold drink, coffee or tea and freshly baked goods of the day by the very talented kitchen staff. We got a batch of fresh donuts.

You are briefed on how things work at the resort and register your details, sign the liability releases and make your payment before checking into your room. Do not forget to renew and bring a copy of your dive insurance with you as you won't be able to dive without it – remember, there is no WIFI at the resort so you can't go online to retrieve it. If you did not opt to make a bank transfer for your resort stay and dives, it is important to note that the payment is made in cash, preferably in Indonesian Rupiah, or it can be made in USD, EURO or GBP. We made our payment in Indonesian Rupiah and it took 4 visits to ATMs in Bali to be able to get the full amount out due to daily withdrawal limits. It's a good job we had found this out at the very start of our trip. You'll be carrying hundreds of local notes around, so make sure you have a big envelope to store it until you get to the resort. You will also need to purchase the Komodo national park permits at the resort and those are in Indonesian Rupiah only so get all your cash needs done on the mainland as you won't be able to get cash on the islands.

There are 3 accommodation options available at the resort. There are a few Sea View en-suite Fan Rooms or Sea View en-suite AC Rooms (you need to be quick to book these), and then there are the Garden Bales for budget travellers with shared bathroom and shower units. The mattresses were unfortunately not at all comfortable in our room, so we didn't sleep very well, but the Indonesian food served in the dining area was surprisingly the best food we had for the duration of our holiday. Those living on the island for long periods of time get a little tired of eating the same food every day so they serve international cuisine once a week, and our last night landed on their Italian night which was a real shame as the Indonesian food is really fantastic and it would have been


Magnificent sea anemone (*Heteractis magnifica*)


Colony of neon green *Favites abdita* which is Calcareous coral.

nice to end the trip with the food they are best at. I discovered my first taste of tempeh and have been craving it since. Make sure you try their banana pancakes with Nutella for breakfast. You'll thank me later!

You will be quick in getting used to cold showers as there is no hot water at the resort, but it's all part of the adventure. Sometimes air gets trapped in the pipes as we found out and there were 2 occasions when we had no water at all which can be inconvenient when you've got a hand full of soap before checking to see if the tap works. We booked in for the 4 days/3 nights with 6 dives and were lucky to get the last Sea View room with AC when I booked the trip back in March. If you are planning a trip over with only diving in mind, then get the 9 or 12 dives as 6 was definitely not enough to see the full variety of marine life (we only got one dive with mantas), but as this was our first trip to Indonesia, we also wanted time to explore other parts of the country and get a good mix of land and sea. There is so much to see and do, you really have to decide what it is you want out of it.

DIVE DAY 1

1 | MAWAN – MANTA DIVE

THE EXPERIENCE: ★★★★

DIVE SITE INFO: This gorgeous sloping soft coral reef is home to several manta cleaning stations. There's much to see aside from manta rays though. From sharks to hairy shrimp, the occasional stargazer and all manner of nudibranchs.

WHAT WE SAW: It turned out Yoi our dive guide, was not as experienced as we had hoped and he jetted off ahead of us and never once pointed anything out. We however slowed down to enjoy the moment (it's a very relaxed dive and there was no current) and we managed to see so much once we took it all in. First in view was a juvenile Blacktip reef shark (*Carcharhinus melanopterus*) and two Bluespotted ribbontail rays (*Taeniura lymma*). Yoi wasn't heading out to show us anything in particular as I kept an eye on him, but he was on a mission to get through the dive site, and soon realised we were in no hurry. I'm glad we took our time with the blacktip as I did not see another one on the rest of our dives. Amongst some of the beautiful coral, of the more prominent encounters, we saw two Yellow-edged moray eels (*Gymnothorax flavimarginatus*), an Orangutan crab (*Achaeus japonicus*), Scorpionfish (*Scorpaenopsis sp.*), a Red-spotted coral crab (*Trapezia rufopunctata*), a Leaf fish (*Taenianotus triacanthus*) with a crazy revolving eyeball which I only realised after looking back at the video footage, and a few Clark's anemonefish (*Amphiprion clarkii*). This was a really nice introductory dive which you really need to take the time in to get a really good look around. There's plenty to see in all the nooks and crannies.

2 | SIABA KECIL – DRIFT DIVE

THE EXPERIENCE: ★★

DIVE SITE INFO: Although this site can be dived at slack tide, we like to wait until the current has picked up for this exhilarating drift dive. Sometimes called the 'superman drift', this is an adrenaline filled dive along with a beautiful reef with a stunning overhang. After exploring the amazing topography, the current will die down and you can look for macro species or enjoy the schooling fish in the beautiful hard coral garden.

WHAT WE SAW: This turned out to be a very disappointing and barren dive. We were joined by our dive buddies Denise and Chris – a couple from Australia – and their dive guide Aldo who had decided with Yoi to take us in a different direction from the rest of the group to try and find dugongs that had supposedly been spotted in the area. This dive was unfortunately a write-off as our guides decided to hang in strong current for something to happen which we had not fully understood from the briefing apart to keep an eye out 'IN CASE WE SEE' dugongs. When we signalled that we had had enough of fighting the current and the wasted time of seeing

nothing, we were lucky we got to spend a brief moment with a curious hawksbill turtle (*Eretmochelys imbricata*) just as we got on the move. Our drift dive gradually took us through to a large area full of very damaged coral and we saw nothing more than one last passing hawksbill turtle just before we surfaced. It was very evident that this side had faced the destructive fishing practices such as dynamite, cyanide and compressor fishing which severely threatens the park (the coral reefs) and the resources themselves (the fish and invertebrates). Although this illegal practice has reduced today, destructive fishing practices continue, mostly by immigrant fishermen. There are several areas on the other dives where we noticed coral graveyards.

When we got back up on to the boat, the rest of the group had seen all the beautiful hard coral garden and the schooling fish as they had gone in the direction that had been described in the briefing. It does happen, but this was led primarily to poor dive planning which is a shame when you only have 6 dives to see as much as possible. Dugongs would have been nice, but there is absolutely no guarantee you'll be lucky enough to see them and we had not expected it as it is so rare.

3 | TATAWA BESAR – DRIFT DIVE

THE EXPERIENCE: ★★★★

DIVE SITE INFO: This gorgeous reef begins with an abundance of soft corals. As you drift along the sloping reef the corals change to beautiful hard corals making this one of the prettiest sites in Komodo. The site is rich with schooling fish.

WHAT WE SAW: This was a proper fun, fast drift dive with lots of beautiful coral. We dived with Chris and Denise and luckily their dive guide Aldo took us to see two resident Giant frogfish (*Antennarius commersonii*) which is always a dive highlight. There are a variety of Butterflyfish (*Chaetodontidae*) and Angelfish (*Pomacanthidae*), the distinctive and good-looking Harlequin sweetlips (*Plectorhinchus chaetodonoides*) and the Oriental sweetlips (*Plectorhinchus vittatus*) and the gorgeous Clown triggerfish (*Balistoides conspicillum*) which I love, as well as the camouflaged Crocodile fish (*Cymbacephalus beauforti*). It was a very good last dive to make up for the poor second.

BAT ISLAND SUNSET TOUR

If there is one thing you want to make sure you do not miss out on when you're in Komodo, it's the sunset fruit bat tour. It is part of your schedule if you have booked the 5 night/6 day package, but you'll need to pay the extra if you are on the shorter resort dive package (you just have to see when it can be done, dependant on the number of guests going). It's only a short boat trip over to the edge of Bat Island to wait for the hunting hour to begin. The sky gains hues of pinks and oranges and just as the sun has tucked below the horizon, the bats take flight and spread through the sky in the thousands as they head out to feed. It's stunning to take in all the other lamplit boats and guests watching as the skies change colour and fill with rodents in flight.

DIVE DAY 2

4 | WAENILU – MUCK DIVE

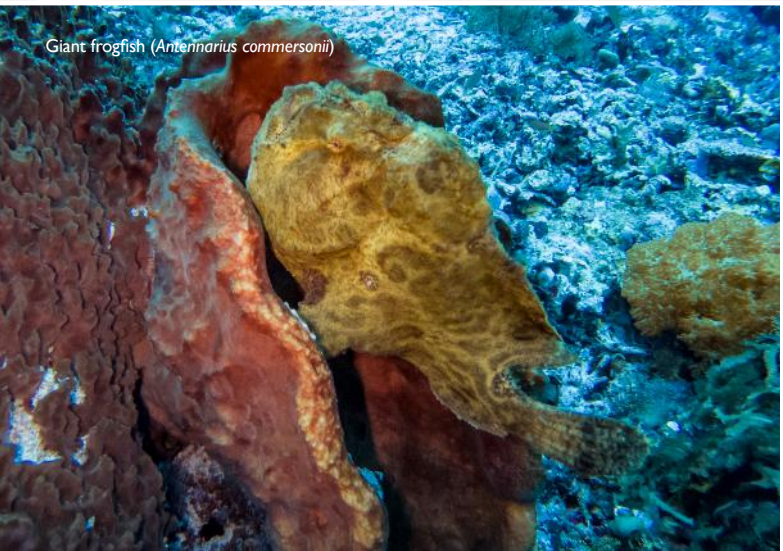
THE EXPERIENCE: ★★★

DIVE SITE INFO: A sandy slope with lovely soft corals. Usually little to no current, so a great opportunity to look for smaller, more bizarre critters.

WHAT WE SAW: This dive led me to find my first ever Wunderpus octopus (*Wunderpus photogenicus*) which I was ecstatic about. What a special find! It was unfortunate that I only discovered the Wunderpus just as we were reaching the end of our No Decompression Limit (NDL). I noticed something wriggle below me as I signalled to make our way up and decided to descend back down to see what it was and literally got 2 minutes to film and take a photo as I signalled to Denise to get in with her camera. She had not yet realised what it was and couldn't have been happier with the result to the end of this dive.

Leaf fish (*Taenianotus triacanthus*)

Black-spotted pufferfish (*Arothron nigropunctatus*)



Giant frogfish (*Antennarius commersonii*)

Scorpionfish (*Scorpaenopsis sp.*)


Wunderpus octopus (*Wunderpus photogenicus*)

Other highlights included a very beautiful Yellowbanded pipefish (*Doryrhamphus pessuliferus*) and two very tiny Pikachu nudibranchs (*Thecacera pacifica*), a juvenile Ribbon eel (*Rhinomuraena quaesita*), its jet black head protruding from the sand with a very faint yellow dorsal fin. I have not often seen the juveniles and although it is thought they are a different species of ribbon eel, there is in fact only one. Juveniles and sub-adults are jet black with a yellow dorsal fin and are born male. Adult males are blue with a yellow dorsal fin and the most common I have seen, whilst the females are yellow… but begin their life as a male. They are protandric (it is the only moray eel that is) which in a nutshell, means they can change from male to female as a survival tactic. And a Black-spotted pufferfish (*Arothron nigropunctatus*) got in just before we surfaced above masses of soft corals which I always find a photogenic species.

5 | KARANG MAKASSAR – MANTA POINT

THE EXPERIENCE: ★★★★★

DIVE SITE INFO: This fun drift dive has a long flat topography with coral bommies and stretches of reeds speckled along it, acting as the manta cleaning stations. Here we can see mantas cleaning, feeding and even mating. Macro critters can also be spotted along the coral rubble that forms much of the dive site.

WHAT WE SAW: This is not a pretty dive site and when you get below the surface, it's a rubble bottom as far as the eye can see. Nevertheless, this is the dive we had been waiting for! It had taken one of the Divemaster interims 15 dives before he got to see his first Reef manta ray (*Mobula alfredi*), I had been incredibly worried that Tony and I would not get to see them at all and then we both got to see our first manta face to face on our 5th dive. Almost immediately after our descent, I was messing about with the GoPro filming Denise, when I heard Tony shouting for me to turn around (sound effects all on video for the ultimate memory keepsake). As I did so, my/our first ever manta glided majestically out of the gloom and came straight at me, gracefully giving me a show of all sides as it looped around us. Just as it glided past me, in came a Spotted eagle ray (*Aetobatus narinari*). It's hard to compensate for both photo and video, but video took precedence so it is the better footage of the two mediums and yet I still need to find the time to edit a film of it all. We saw 5 mantas in total which was fantastic. We saw what we came for, and that is always a bonus when plans pan out.

On following the direction of the current, we had a fantastic drift dive that went on for about 2 km. We saw a juvenile Whitetip reef shark (*Traenodon obesus*), I missed it, but Tony saw another Blacktip, big schools of fusiliers, only 5 grazing Green humphead parrotfish (*Bolbometopon muricatum*) the largest species of parrotfish which still remains one of my favourite memories from my dive trips to Sipidan – I had been expecting to see them in Indonesia, and especially in Komodo in similar numbers, but this was not to be. We did see quite a few Titan triggerfish (*Balistoides viridescens*). These evil beasts still make me nervous unlike anything else underwater.

6 | SHARK POINT

THE EXPERIENCE: ★★★★★

DIVE SITE INFO: Beautiful sloping coral reef that extends into the main channel where there is a good chance to see black and whitetip reef sharks swimming by. Shallows up to a large area of extensive hard corals which we fondly call "turtle town".

WHAT WE SAW: This dive site should be renamed 'Turtle Point' as this is exactly what you will see, and plenty of them. We saw no sharks which I always find so sad and actually

ABOVE: When a line of turquoise divides deep and shallow waters. **OPPOSITE PAGE:** Chilling out on the Alfredi dive boat inbetween dives. Scuba Junkie Komodo Beach and Dive Resort dining room and the sofas and hammocks overlooking the water, perfect for watching sunsets. Your last day takes you to Rinca to explore the island on foot and see the Komodo Dragons up close and personal before heading back to Lubuan Bajo to catch your flight to your next destination.

surprised me as I had thought I would have seen plenty of them in Komodo's national park. This site hosts some very healthy cabbage coral in great numbers as well as other interspersed species of hard corals, such as staghorn and acropora. I got one of my favourite seascape shots from this site with the background dotted with Lemon damselfish (*Pomacentrus moluccensis*) and what looked like they could be Yellowtail damselfish (*Neoglyphidodon nigroris*). It's a very beautiful dive which we thoroughly enjoyed as an end to our underwater Komodo experience.

It's Green turtle galore (*Chelonia mydas*) and they are not at all camera shy – we had a good photo shoot with one having a spa session with a cabbage coral. Amongst the wonderful world of underwater species, we saw a Trumpetfish (*Aulostomus chinensis*), lots of my favourites – the deep red Glasseye (*Priacanthus blochii*), Spine-cheek anemonefish (*Premnas biaculeatus*) and Western clown anemonefish (*Amphiprion ocellaris*), a very large Starry pufferfish (*Arothron stellatus*) just lazing on the sandy bottom, a Black-pitted snake eel (*Pisonophis cancrivorus*), an almost translucent Crocodile fish performing his camouflage magic, and a colossal colony of neon green *Favites abdita* which is Calcareous coral, that brightened up its colour once I shone my light on it.

THE DIVE BOATS

It just so happens, Scuba Junkie have the biggest, fastest and most comfortable day boats in the park. Their 2 'fun' dive boats which you will be assigned to for the duration of your stay, are the 'Birostris' (named after the Oceanic manta ray) and our boat, the 'Afredi' (the Reef manta). They are very spacious and both have a sundeck with comfortable bean bags for lounging about and getting some sun (there is also a shaded area), while looking out to the stunning scenery and possibly spot the odd dolphin.

Breakfast and lunch is served at the table by the bow of the boat on your diving days. Breakfast is a selection of pancakes, eggs, fresh fruit, bread, tea and coffee. Lunch has both a meat and vegetarian option and was delicious on both our days.

All your dive equipment is taken care of, labelled and loaded into baskets at the dive deck in the stern of the boat. It's organised! The boat is also equipped with emergency 100% oxygen, first aid kit, life jackets, fire extinguishers, marine radio, sonar and GPS. Both boats are 20 m x 4 m and have 6 cylinder Mitsubishi engines.

If you are planning on travelling with your own equipment, it's good to note that wetsuits will take a long time to dry when it's humid. We always travel with our regulators, fins and masks and were happy to rent the BCDs and wetsuits. Don't forget that there is limited luggage allowance on the small internal flights and you may have to purchase some extra allowance if you're taking all your kit with you.

THE KOMODO DRAGONS

To end a wonderful stay with Scuba Junkie, your last day requires an early morning check out and you will experience one last tour over on Rinca Island where you will spend an hour walking around the island with a guide who will introduce you to the resident Komodo Dragons. These big lizards are awesome and very special to see. There is also a tour over on Komodo Island which we did afterwards when we moved on to our next destination, but this one will soon no longer be available as the government is planning on a year-long shutdown from January 2020 in order to restore the habitat. It is the more beautiful island of the two and rightly so, as it is the UNESCO World Heritage site itself. It will have to be seen how the island will be offered to tourism after its rehabilitation as there is still some debate.

The Komodo Dragon is the largest living species of lizard and can grow to a maximum length of 3 metres, though this is rare, and they can weigh as much as 70 kg. An ambush hunter, these reptiles are able to run at speeds of up to 20 km/h over short distances. Who knew?!? It has been claimed that they have a venomous bite through two glands in the lower jaw which secrete toxic proteins, but scientists are still disputing this. The park rangers will tell you a few tales of attacks and keep you vigilant. They are of course carnivorous, they eat everything with or without a beating heart and are known to eat their young, which is why they live their first 2 years of life up in the trees, hiding from the adult cannibals. The young eat birds, small lizards and bugs. When they get big enough, they come down out of the trees and start hunting the deer and pigs on the island. I've read that they occasionally ate human corpses, digging up bodies from shallow graves. It caused the villagers of Komodo to move their graves from sandy ground to clay and pile rocks on top of them to deter the lizards.

Do not pester the dragons! They run faster than you do…

SCUBA JUNKIE

Conservation and protection of the oceans sits at the very head of Scuba Junkie. They have a conservation arm: Scuba Junkie SEAS (**www.facebook.com/scubajunkieseas/**) that focuses on empowering communities and engaging with them to reduce negative impacts – from destructive fishing methods to reducing waste. In Komodo, they run Divemaster internship programmes, providing alternative livelihoods for those who may otherwise turn to fishing.

Scuba Junkie engage with the local community as much as possible, running awareness weeks throughout the year (Manta Week, Shark Week and Marine Week) where they do school visits to talk about local issues and what kids can do to help the local marine life. The resort is always working towards reducing impacts and being as eco-friendly as possible.

Scuba Junkie has five locations across Malaysia and Indonesia, at some of the top dive spots in South East Asia: Sipadan, Nusa Penida and Sangalaki.

www.scubajunkiekomodo.com

TRAVEL INFO

CURRENCY: Indonesian Rupiah (IDR)

Credit cards are widely accepted in hotels, large restaurants, and most shops.

ATMs are common in all major Indonesian cities and tourist destinations. Withdrawal limits are dependant on your respective home bank. Machines are loaded with IDR50,000 or IDR100,000 denomination notes, as indicated on the machine; however keep in mind that the bigger notes can be harder to split, especially in rural non-tourist areas. It is also best to withdraw money from ATMs in major cities before venturing into more secluded destinations.

VOLTAGE: The standard voltage is 230 V and the frequency is 50 Hz. You can use your electric appliances in Indonesia, if the standard voltage in your country is between 22-240 V (same as UK, Europe, Australia and most of Asia and Africa).

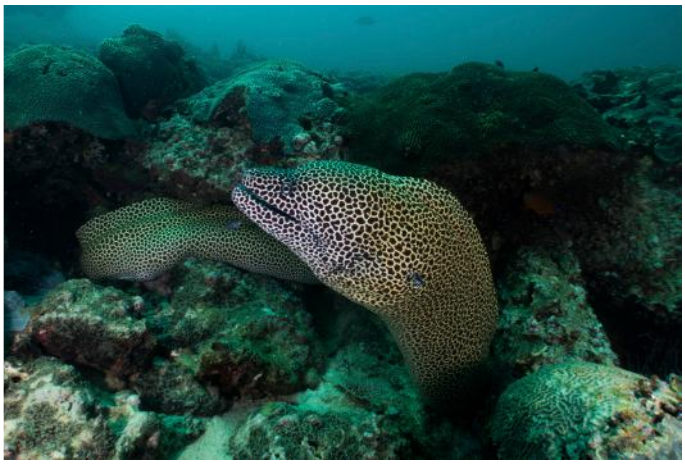
VISA: Visas are issued upon arrival and are valid for 30 days, but you will need to check your nationality is available on the visa-on-arrival countries list.

CLIMATE: Indonesia's climate is almost entirely tropical. The dry season is April to October, while the wet season is November to March.

LANGUAGE: Bahasa Indonesian is the national and official language and is used in the entire country. While generally not widely spoken, an acceptable level of English can be understood in a number of major cities and tourist destinations including Bali, Batam, Jakarta, Bandung, Surabaya, and Yogyakarta.

THE ADVENTURES OF A UAE DIVER

FEATURE **SARAH MESSER** PHOTOGRAPHY **BINBREIK**



In a 'normal' introduction, we give our personal details; name, where we live, maybe how many kids we've got (or cats in my case), and in Dubai likely the make of your car and your job title.

However in a diver's world, your sea credentials are much more important; how many dives have you done, what's your cert level, how international have you gotten, what's your pelagic count, cephalopods or nudibranchs? The only car question we need to have is how many diving kits you can fit in the boot.

This is me: 160; Rescue; Fujairah – A LOT, Oman – not enough, Maldives, Komodo, Sri Lanka, Cyprus, France, Zanzibar, Egypt; cephalopods (what's not to love about a creature that can put on a light show for your personal enjoyment); 4 diving kits.

And that's all in the last 2 years since passing my OW. So this could be the Adventures of an Addicted UAE Diver, and let's face it, if you're reading this, you're likely looking for excuses to get in the sea as often as possible as well…

Summer is now back and while the rest of the land-based UAE residents are running for the dehumidifier and air-con controls, you and I are stupidly excited that the local UAE and Oman peak diving season is here, and are fully prepared to sweat profusely on a dhow or speed boat for several hours to enjoy it. We eagerly await the return of the stingrays after the winter water migration; and the pea-soup visibility clearing to at least a miso-soup level (YES!); and those teeny little jellyfish that are invisible to the naked eye disappearing for a few months (DOUBLE YES!).

If you belong to a local group and haven't yet got a trip organised to the Daymaniyat Islands, off the coast of Muscat, Oman, hassle your group administrator immediately (nicely, or they will tell you to organise your own trip!). Just a 4 to 5 hour drive from Dubai, the Daymaniyats are a group of islands that form a large marine conservation area, and the quality of the coral and sea life is excellent. Not only that, but right now – yes NOW – is peak Whale Shark season. Running August through September, these majestic creatures are cruising through feeding on the rich plankton waters during this time and sightings are frequent. I saw my first of the season 2 weeks ago, a beautiful 3 metre long juvenile passed by on my safety stop. What are you waiting for?

Tried, tested and recommended dive centres are SeaOman, based both in Mussanah (stay at the Millennium Hotel Mussanah for easy access) and at The Wave (stay at the Mysk al Mouj Hotel or if there's a group of you, the Fraser Suites offer comfortable 2 and 3 bedroom apartments and are only 15 mins away); and the newly opened Mola Mola Diving Center, that started out just this summer, based at The Wave, is also worth considering. You'll have a great time in a super location with either of these dive outfits. It takes around 45 minutes to one hour to reach the islands, depending on which dive sites you're going to. My personal favourites – Aquarium for the plentiful reef fish, and Coral Garden for its stunning coral formations and the resident friendly turtles who can't resist getting up-close to say hello.

Get out and make the most of this glorious season, remember your factor 50 sunscreen and a hat, and see you in the next edition with more UAE diving stories!

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FEATURE **STEFANO RUIA**

DAN | AlertDiver

Hold your breath: DAN Europe received a prestigious recognition for their work in the field of apnea diving, thanks to valid findings in the correlated genetic research. Now you can breathe again: DAN Europe's work in this field will continue to go deeper!

One of the problems faced by many apnea divers (around 26%) is the development of pulmonary oedemas caused from practicing their favourite activity. The topic is becoming more and more present in social media and chat rooms among underwater fishermen. Even Mr. Danilo Cialoni, Coordinator of DAN Europe Foundation's department of Research Techniques Development and also a passionate apnea diver and instructor, suffered from it, as he described in a text box in the latest book by Umberto Pellizzari (Specific Training for Apnea. Deep Apnea, Static and Dynamic, Addictions-Magenes Editoriale, 2014): "As I continued to improve my apnea performance, I started noticing the presence of some blood in my saliva at the end of each training session. The phenomenon grew continuously more noticeable and more bothersome; no one could give me any trusted information, and the data available to the scientific community was almost nonexistent. One day, the problem was much more evident and traumatic… The training session was over but I had to return to the bottom, at 36 metres, to free the anchor of the accompanying boat. In the end, I managed to do it, but I immediately realised that something bad had happened to me. As I surfaced, the strange feeling worsened. It felt like there was no air in the atmosphere, and for each breath, oxygen was never enough. It was hard to overcome this shortness of breath, and it took me a while to breathe normally again. In the emergency room, less than an hour later, my coworkers at the hospital had me undergo a CAT scan, allowing them to see the condition of my lungs, which were full of blood, extravasated during my effort at the bottom and also due to equalising during the descent. My case was so severe and rare that, instead of the usual recovery that takes a few hours, it took 3 days for my lungs to return to normal and over 3 months for total recovery."

THE RESEARCH

In the years following this incident, Mr. Cialoni passionately dedicated himself to understanding the real mechanism that provoked it, and thanks to numerous research collaborations with DAN Europe, other authorities, Universities and training organisations, he was able to carry out many tests on apnea divers. Now a clear picture began to take shape. Essentially, the pressure at depth causes the blood in the lungs to engorge, a phenomenon that is called blood-shift and is very similar to what happens during extreme exertion or high-altitude hypoxia. This phenomenon is well known and studied in other fields. In test after test, research has shown that pulmonary edema in divers is linked to an increase in pulmonary pressure, and all measures that cause a rise in intrathoracic pressure, such as equalisation, make the situation worse. Some subjects, who are predisposed, cannot withstand the rise in pressure quickly enough and they develop a pulmonary edema, which is "non-cardiogenic" because it is not caused by heart disease.

Mr. Cialoni needed to understand how to know whether a subject was predisposed or not. Understanding the phenomenon made it possible to discover that gradual adaptation and proper heating could drastically reduce the symptoms, just like it happens with acclimatisation for mountaineers. These practices are good precautions for all apnea divers, but they need to become the rule for those who are prone to pulmonary oedemas.

At this point, the innovative idea was to break down the wall: rather than devote time to a research on phenotypes (the observable characteristics of an organism), better to directly analyse the "software" that controls the human body: genomes. This resulted in a research project conducted in collaboration with Prof. Alessandro Marroni and Mr. Max Pieri of DAN Europe Research, Prof. Nicola Sponsiello and Mr. Vittorio Lucchini.

The scope of this study was to identify the polymorphisms that indicate a higher risk factor in those who have them. The investigated polymorphisms were those associated with the production of enzymes that regulate pressure in blood vessels. Subjects who have the "good" variant of these genes are able to better sustain the increase in lung pressure caused by blood-shift, and they have a lower risk of pulmonary oedemas.

The study focused on two particular variants of the gene for the Endothelial Nitric Oxide Synthase enzyme (eNOS): The G894T, which assists in the regulation of vasodilation, blood flow and blood pressure, and the T786C, associated with pathogenesis of heart disease. Variants of the converting enzyme angiotensin (ACE) were also studied. All three investigations showed a significant rise in the risk of developing a pulmonary edema, as explained in the publication, 'Genetic predisposition to breath-hold diving induced Pulmonary Edema: Up-Date,' written by the same researchers, of which Mr. Cialoni is lead author.

These studies and their subsequent publication were greatly recognised during the annual EUBS (European Underwater and Baromedical Society) meeting in Wiesbaden, where the authors were awarded the acclaimed 'Patrick Musimu Award 2014.'

WHAT WILL CHANGE FOR APNEA DIVERS?

The outcomes of this study in the apnea

diving world are revolutionary. It is now enough to take a genetic test to know one's predisposition to pulmonary oedemas. DAN Europe has already made a quick and simple method available for taking the test: the apnea diver is provided with a tube with a closed cap and a cotton swab inside. The diver just needs to open the tube, swab his/her inner cheek, and close the tube… just like you see on television crime series. This is to gather some cells on the inner wall of the cheek; cells which will be tested by a genetic testing agency in order to analyse DNA to obtain a genotype. The report will let the apnea diver know if he/she is at risk of developing a pulmonary edema. Having investigated three different polymorphisms, of course there will be some unlucky subjects who possess all "bad" versions of the genes, and lucky ones who have "good" versions of all three, but most of the apnea divers' results will be mixed.

This does not mean that those who are less at risk should not take precautions. The real goal is to inform those who are more prone to pulmonary oedemas that they need to focus more on reducing external risk factors; proper heating can make up for the diver's less-than-optimal genotype.

Another step forward may come from a new study that DAN Europe has started, which means to make up for the lower production of nitric oxide in people with a non-optimal genotype through specific and personalised nutrition plans. The study looks at how diet can lower the risk of developing a pulmonary edema for those who are prone to it, and possibly put them at the same level as those "lucky" divers who are not predisposed. A new branch of science is born at DAN Europe, that of "nutrigenetics," and it will fully become a part of the diving world!

DAN EUROPE AND APNEA DIVING

In addition to scientific research, DAN Europe takes care of divers in terms of emergency management, by setting up low-cost and simple insurance policies for apnea courses and training, in addition to those already provided for sports divers. The policies cover all activities of apnea diving: general apnea diving, underwater fishing, and static and dynamic apnea diving competitions. There are three levels of courses: Apnea Entry (beginner-level courses up to 30 metres deep), Apnea Advanced (second-level courses up to 30 metres deep) and Apnea Speciality (specialisation courses up to 40 metres deep). There is also an Apnea Training week-long insurance policy, which also covers the use of the sled, and applies to depths of up to 100 metres for variable weight apnea and 70 metres for constant weight apnea.

DAN Europe and apnea divers continue "arm in arm" on the path to make diving into an activity that is always more enjoyable, safer and more… breathtaking!

DCS IN THE MALDIVES

FEATURE **TESSA BERGHOUT**

Imagine enjoying a well-deserved holiday in the exotic Maldives and being able to go on diving trips to see the beautiful coral reefs… This is what a 60 year old DAN member from France was doing, until he found himself one day coming up from a dive feeling very ill and disorientated.

It was only about ten minutes after his first dive, in the morning at Gaaf Alif, that he had a sudden onset of dizziness, nausea and vomiting. 100% oxygen was applied by demand valve on the boat for one hour, however, without major improvement. Being aware of the fact that DAN operates through an international network of alarm centres, active 24 hours a day, DAN Europe was alerted by the dive-guide of the safari boat who asked for assistance. DAN recommended to send the patient to the nearest hyperbaric facility. Being in the middle of the sea, this was easier said than done! After checking the options of transport available, DAN arranged for an emergency speed boat to pick the patient up from the safari boat and bring him to the medical hyperbaric centre at Villingili on the Atoll of Addu. In the meantime, the medical centre was alerted by DAN and was on stand-by for the patient's arrival.

During the transfer the injured diver was administered normobaric oxygen twice an hour. Upon arrival, the patient was unable to walk on his own and continued to suffer from nausea and dizziness. After initial medical examination, inner ear Decompression Sickness was diagnosed and hyperbaric chamber treatment according to Table 6 of the US Navy was started. After therapy the patient was able to walk on his own, but was still not 100% recovered. Another Table 5 treatment was necessary the next day for the symptoms to disappear completely.

DAN was very pleased to hear that the treatment had the desired effects. Since the diver was insured with a Sport Silver policy, the costs for the speedboat evacuation and the hyperbaric treatments were fully covered. He also had been reimbursed the cost of re-fuelling the speedboat (that he happened to pay for during the emergency) and the extra accommodation charges incurred during the time of therapy. The total costs added up to about 12,000 Euros.

With a DAN membership, you can count on DAN wherever you are!

UPCOMING EVENTS

EDA MOVIE NIGHT WITH VOX CINEMAS

ZAYED'S ARCTIC LIGHTS AND Q&A | VOX Cinemas, Mercato Mall
Wednesday 13th November 2019 | 18:30 Registration, 19:00 Movie Starts

Zayed's Arctic Lights, is a documentary that chronicled a two-week expedition to Antarctica by three EAD staff members as they witnessed and studied first-hand the impact of global warming and climate change. The journey was part of the Climate Force International Antarctic Expedition led by Sir Robert Swan, the first explorer to walk to the North and South poles.

The UAE is one of the countries vulnerable to the effects of climate change. With nearly 1,300 kilometres of coastline, it is imperative that the UAE undertakes collaborative efforts to mitigate the risks of rising sea levels.

We are honoured to have Winston Cowie, Manager of Marine Policy, Regulations and Planning at Environment Agency – Abu Dhabi join us for a Q&A after the documentary.

CLEANUP ARABIA 2019 CAMPAIGN

DIVE AND BEACH CLEAN-UPS | EAST COAST
Friday 1st November 2019 | 8:30am **(EDA Members Only)**

DIVE AND MANGROVE CLEAN-UPS | ABU DHABI
Friday 8th November 2019 | 8:30am **(EDA Members Only)**

The campaign is made up of EDA members and stakeholders that participate in dive site and coastal clean-ups which help shape their consciousness concerning marine litter and saying no to single-use plastics! Inspiring change to make a difference together.

DID YOU KNOW?

PLASTIC ADRIFT – SHOWING WHERE PLASTIC ENDS UP (www.adrift.org.au)

A cute rubber duckie shows up on the map above, but the experiment you are about to do when you click on the map, is actually very sad. You are investigating how plastics move in the ocean.

Plastic litter is one of the biggest problems in our ocean. It can entangle marine animals, or they mistake it for food and eat it. If that happens, the plastic gets into the food-chain, and the chemicals in the plastics can be very harmful.

Our oceans make up 70 per cent of the Earth's surface and are in constant motion. Driven by the sun and the wind, our oceans develop mighty currents and eddies, some of which can take centuries to loop through all of our planet's ocean basins. These currents also move through three dimensions. Many rise from the deep ocean near coastlines, while other currents descend to the deepest parts of the ocean. These vertically descending currents are often, but not always, in the middle of the ocean in regions known as the five great gyres. These gyres are giant vortices spanning the whole ocean basin where water at the surface slowly spirals inwards until it sinks.

However, almost all plastic materials and objects lighter than water (such as messages in a bottle) stay on the surface.

If you want to know more about plastics in the ocean, go to: **www.plastinography.org**.

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INSPIRING CHANGE TO MAKE A DIFFERENCE TOGETHER

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1st **NOVEMBER** – DIVE & BEACH CLEAN-UPS EAST COAST | 8th **NOVEMBER** – DIVE & MANGROVE CLEAN-UPS ABU DHABI

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