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DIVERS FOR THE ENVIRONMENT

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MINKE MAGIC
ON THE GREAT BARRIER REEF

• THE STORY OF PLASTIC • **PADI'S CHRISTMAS GIFT GUIDE** • SAVING THE MANATEES OF BELIZE
• **ARABIAN GULF CETACEANS** • NORFOLK'S CHALK REEF • **DIGITAL ONLINE 2022** • SOCOTRA

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EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION 2022

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Sunday 17th April 2022 @ 11:59 pm (GST)

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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 March 2022. Send all articles, feedback or comments to: **magazine@emiratesdiving.com**

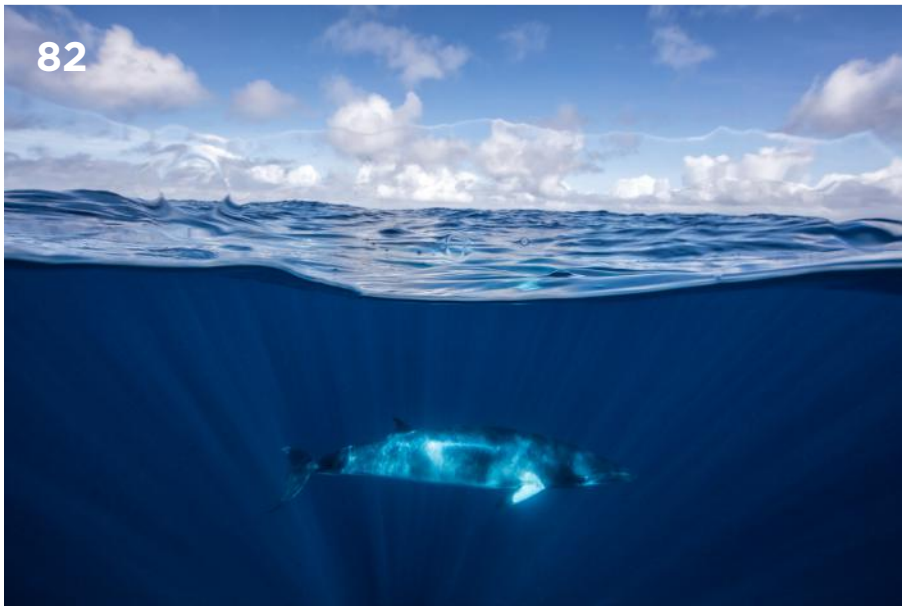
COVER

PHOTO BY SIMONE CAPRODOSSI
Minke Magic on the Great Barrier Reef
www.sundive.com.au

REDUCE REUSE RECYCLE

DIVING DESTINATIONS

HEALTH



EDITOR & GRAPHIC DESIGNER

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

COVER STORY

SIMONE CAPRODOSSI
Simone is an award winning Italian underwater and travel photographer. He lived in Dubai for 12 years and has been a main feature contributor to the EDA Magazine and is one of EDA's Digital Online competition judges. Simone now resides in Australia where he owns and manages the Sundive dive centre in Byron Bay.
www.sundive.com.au | Instagram: @scaprodossi

THE QUARTERLY CONTRIBUTORS

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

JAMAL GALVES
Jamal has been passionate about manatee conservation since he was 11 years old when he joined manatee scientists at Clearwater Marine Aquarium Research Institute to assist with manatee health assessments. Now the Programme Coordinator for CMARI's Belize Manatee Conservation Programme, he fights for manatee protection and preservation, and their ecosystems.
Instagram: @therealmanateeman

CHRIS TAYLOR
Chris is a full-time photographer and filmmaker living in Sheringham on the North Norfolk coast of the UK. He has shot everything from weddings to stately homes, wildlife, tourism brochures and events, but has recently moved his work towards his passions in travel and maritime imaging.
www.christaylorphoto.co.uk

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

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**.

THE YEAR OF THE 50th

IBRAHIM AL-ZU'BI
Co-Founder & Executive Director

What an honour it is to be celebrating the Year of the 50th which commemorates the nation's remarkable journey from 1971 towards the next transformative years that lies ahead for the next 50!

The activities marking the UAE's Golden Jubilee will be built on the following four pillars:

- Launching the 'Year of the 50th' with a festive spirit that engages all those who call the UAE their home.
- Calling upon all UAE nationals to contemplate the values and achievements of the past in honour of the UAE's Founding Fathers.
- Inspiring youths with their vision of the next 50 years, and supporting them in their national achievements.
- Championing long-term initiatives and impactful policies to empower citizens and residents to do their part.

As we celebrate the UAE's 50th National Day this year – The UAE's Golden Jubilee, we reflect on the spirit that ties us all together, the Spirit of the Union that enables millions of people to coexist and build our lives together. The Spirit of the Union is derived from the vision and leadership of the Late Sheikh Zayed bin Sultan Al Nahyan, EDA's founder, which now lives on through His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE and his fellow leaders of the nation's Emirates who are shaping the UAE's future.

I look back at this year to when we were officially registered as a voluntary non-profit organisation under the umbrella of the Ministry of Community Development and elected our new board members to lead us on for the next four years where we will establish EDA as a cornerstone for the underwater world in the UAE and region.

Making a difference goes beyond protecting the environment and marine conservation, although as you will read in this issue, our divers have been busy organising clean-ups and awareness campaigns. I am very happy to see more activities by different community stakeholders such as the school awareness sessions.

I would like to wish everyone a happy 50th UAE National Day. I also want to wish you all a Merry Christmas and a Happy New Year. I am looking forward to 2022, which I am sure will be an exciting, fun, and rewarding year ahead.

Happy reading and safe diving!

Ibrahim Al-Zu'bi

Ibrahim Al-Zu'bi

EDA'S NEWLY APPOINTED BOARD MEMBERS

CHAIRMAN
HE Essa Al Ghurair

VICE CHAIRMAN
Juma Khalifa Bin Thalith

FINANCIAL DIRECTOR
HE Major General Khalfan Khalfan Quraiban Al Mheiri

SECRETARY GENERAL
Jamal Abdulla Buhannad

HEAD OF THE TECHNICAL COMMITTEE
Major Dr Juma Khalifa Alrahoomi

HEAD OF THE WOMEN'S COMMITTEE
Maitha Al Qader

BOARD MEMBER
HE Talib Ali Aldhuhoori

BOARD MEMBER
Abdulla Salem Alruwaihy

BOARD MEMBER
Ahmed Sultan Al Hasawi Al Tamimi

DIVE TOGETHER CAMPAIGN: KEEPING KHALIFA PORT CLEAN

BY **KATHLEEN RUSSELL – MAHARA DIVING CENTER**

Abu Dhabi Terminals organised another underwater clean-up with divers at Khalifa Port on the 3rd of November. This date was also the UAE's National Flag Day and showing our pride for the UAE, we had 35 volunteers take part in the Khalifa Port underwater clean-up. The event was organised by Abu Dhabi Terminals in partnership with Abu Dhabi Ports Company and Al Mahara Diving Center, and supported by the Environment Agency – Abu Dhabi, Emirates Diving Association, PADI AWARE Foundation, and the Abu Dhabi Female Diving Group.

The clean-up was conducted inside the container terminals along the terminal walls. The dedicated divers had to have deep diving and good navigational skills for this clean-up as they descended to the 19m of sandy/silty seabed. The divers were delighted to report the seabed was reasonably clean as they pulled up just over 35kg of marine debris of mainly single-use plastics within one hour. Statistically, there was an improvement in the amount of debris collected since the last underwater clean-up. The marine debris may have entered the water from the wind blowing the debris, or from the tidal movement in the open water. Some divers saw some marine life such as hammour and yellow bar angelfish along the container walls.

Committed local divers are helping to keep the UAE's marine environment free of debris and contribute to the largest global underwater database in the world, PADI AWARE's Dive Against Debris. To reduce marine debris by 50% in targeted countries by 2030, we need everyone working together at local, national and international levels to achieve the United Nations' SDG#14 goals. As part of the global diving community, we need to combat marine debris. More than 250 million tons of plastic are estimated to make its way into our ocean by 2025. The environmental damage caused by plastic debris alone is estimated at US$13 billion a year. Divers are often at the frontline to witness human impacts on the marine environment and are uniquely positioned to help report, remove and advocate to stop marine debris at its source.

As the Emirate's main container port operator, Abu Dhabi Terminals is committed to protect and preserve the ecological marine environment at Khalifa Port – not only for the employees, customers and stakeholders but also for future generations.

KATHLEEN RUSSELL
PADI Course Director/Starguard Elite Instructor Trainer
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Find us on Facebook, Instagram, Twitter:
@DiveAbuDhabi

AN EDA MOVIE SCREENING **THE STORY OF PLASTIC**

Our social events are back and we had a great turnout from those who made it to our November EDA Movie Screening in which we screened The Story of Plastic with Deep Dive Dubai for the very first time on the 10th of November. For our members not able to attend the screening event in person, we were able to provide them with a private link to watch the documentary online.

EDA has shared the documentary with the young Eco-Warriors from Jumeirah Primary School (JPS) aged between 8 and 11 as part of their educational programme in order to prepare them for their beach clean-up school activity. You can follow their clean-up results on page 22 to see what they are doing with their school to help our environment.

As always, these documentaries give us so much to think about especially where we live, and addresses the situations in the other parts of the world we are not always aware of. The war on plastics is a global issue and one we need to solve together as it is us combined that affect our entire planet.

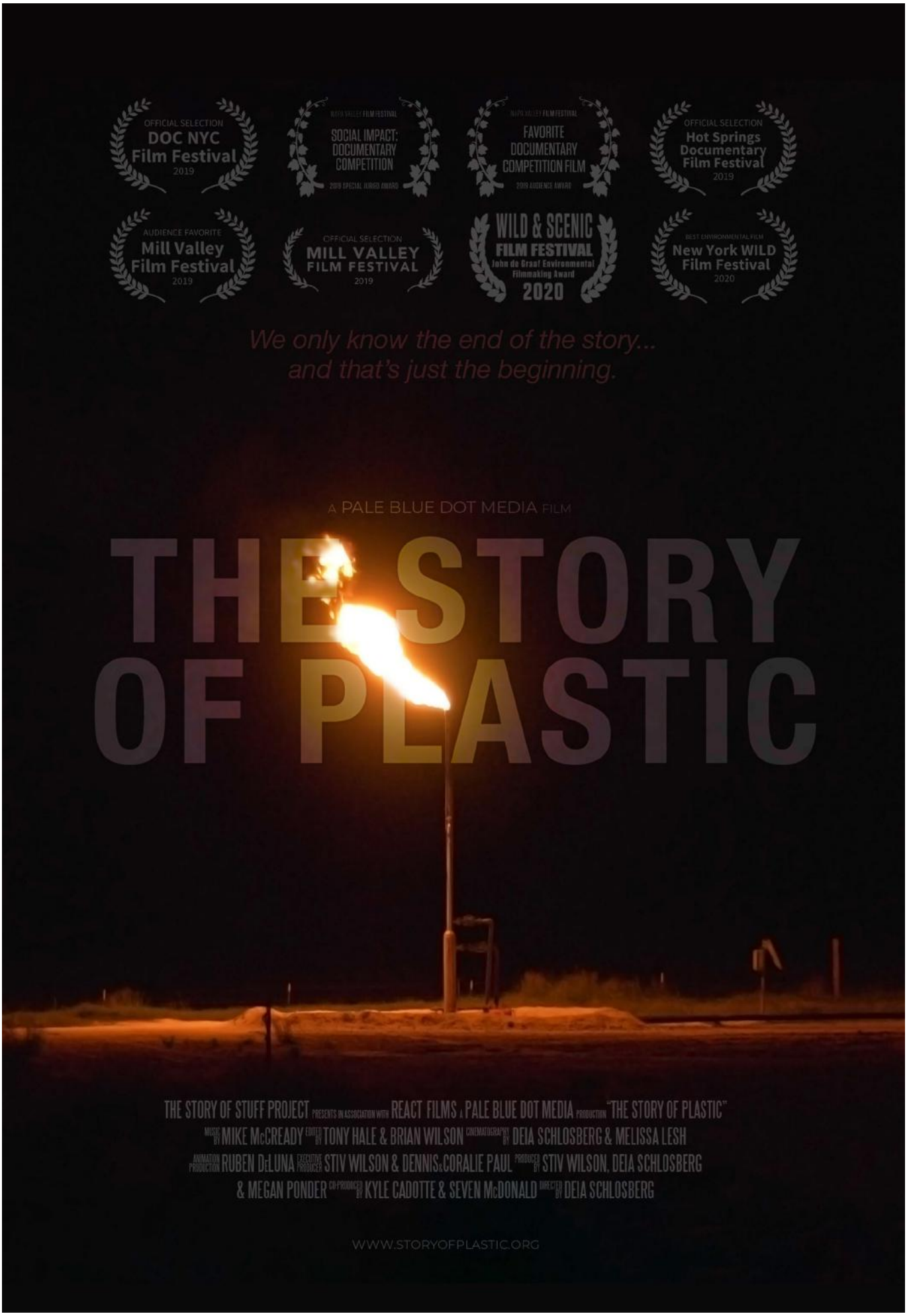
Be the change you want to see.

SYNOPSIS

The Story of Plastic takes a sweeping look at the man-made crisis of plastic pollution and the worldwide effect it has on the health of our planet and the people who inhabit it. Spanning three continents, the film illustrates the ongoing catastrophe: fields full of garbage, veritable mountains of trash, rivers and seas clogged with waste, and skies choked with the poisonous emissions from plastic production and processing. With engaging original animation, archival industry footage beginning in the 1930s, and first-person accounts of the unfolding emergency, the film distills a complex problem that is increasingly affecting the planet's and its residents' well-being.

WANT TO JOIN OUR EVENTS?

Our social events and online EDA Movie Screenings are only accessible to current EDA members and their families. Our screenings have limited spaces and registration to join them is necessary in order be to on the guest list to join the physical event or to receive the special link to view the films online. You can register for EDA membership or renew it on our website:
www.emiratesdiving.com/membership-form


OFFICIAL SELECTION
DOC NYC
Film Festival
2019
SOCIAL IMPACT:
DOCUMENTARY
COMPETITION
FAVORITE
DOCUMENTARY
COMPETITION FILM
OFFICIAL SELECTION
Hot Springs
Documentary
Film Festival
2019
AUDIENCE FAVORITE
Mill Valley
Film Festival
2019
OFFICIAL SELECTION
MILL VALLEY
FILM FESTIVAL
2019
WILD & SCENIC
FILM FESTIVAL
John de Graaf Environmental
Filmmaking Award
2020
BEST ENVIRONMENTAL FILM
New York WILD
Film Festival
2020
We only know the end of the story...
and that's just the beginning.
A PALE BLUE DOT MEDIA FILM
THE STORY
OF PLASTIC
THE STORY OF STUFF PROJECT PRESENTS IN ASSOCIATION WITH REACT FILMS & PALE BLUE DOT MEDIA PRODUCTION "THE STORY OF PLASTIC"
MUSIC BY MIKE McCREADY EDITED BY TONY HALE & BRIAN WILSON CINEMATOGRAPHY BY DEIA SCHLOSBERG & MELISSA LESH
ANIMATION PRODUCTION RUBEN DeLUNA EXECUTIVE PRODUCED STIV WILSON & DENNIS & CORALIE PAUL PRODUCED BY STIV WILSON, DEIA SCHLOSBERG
& MEGAN PONDER CO-PRODUCED BY KYLE CADOTTE & SEVEN McDONALD DIRECTED BY DEIA SCHLOSBERG
WWW.STORYOFPLASTIC.ORG

EPAA REPORTS HIGH LEVELS OF MARINE DEBRIS IN FOUR SPECIES OF SEA TURTLES IN SHARJAH

EPAA researchers responding to stranded turtle.

In the past few decades, we observed an ever increasing interest by the scientific community, policy makers and the wider public on the creeping and growing threat of plastics and other anthropogenic waste in the marine environment. It was estimated that approximately 275 million metric tons of plastic waste were produced in around 200 coastal countries, and that roughly 4.8 to 12.7 million tons of that waste are entering the ocean. A later estimate suggested that, in 2015 alone, 144 million tons of single-use plastic products were produced (approximate equivalent to the weight of 20.5 million African elephants), while a mere 9% of global plastic waste has been recycled. When exposed to natural environments, plastics undergo weathering and degradation into fragments or micro-plastics, increasing their dispersal into different marine environments. Today, plastics and other forms of anthropogenic marine debris occur in every reservoir of freshwater and marine habitat in the world. Consequently, sea turtles are exposed to harmful interactions with marine debris through all of their life stages. Beached marine debris, also known as beach litter, can act as a barrier for gravid (pregnant) sea turtles crawling onto nesting beaches. This forces these turtles to spend additional energy and time through the nesting process, thereby increasing their exposure and risk to predators. Hatchlings are also subject to entanglement or entrapment in beach litter. Marine debris also has significant impacts on the habitats that marine turtles depend on through the introduction of harmful non-native species which hitch-hike onto floating marine debris. Marine debris also causes direct damage to corals, sea grass and other marine habitats that turtles depend on. Still, through all of their life stages, marine turtles are primarily threatened by the risks associated with ingesting or being entangled by marine debris.

In two recent studies published in the Marine Pollution Bulletin titled "Junk Food: Interspecific and Intraspecific Distinctions in Marine Debris Ingestion by Marine Turtles" and "Junk Food: A Preliminary Analysis of Ingested Marine Debris by Hawksbill *Eretmochelys imbricata* and Olive Ridley *Lepidochelys olivacea* Sea Turtles (Testudines: Cheloniidae) from the eastern coast of the United Arab Emirates", the Environment and Protected Areas Authority (EPAA) investigate the ingestion of marine debris by four species of sea turtles from the Gulf of Oman coast of the UAE. This was done through the investigation of the gut contents of the dead, stranded sea turtles as part of the activities of the EPAA's Sharjah Strandings Response Programme (SSRP). This included the sampling of 36 green, 14 loggerhead, 7 olive ridley and 6 hawksbill sea turtles from the coasts of Kalba and Khor Fakkan. Marine debris were detected in 83.3% of hawksbills, 75% of greens, 57.1% of loggerheads and 28.6% of olive ridley sea turtles. To put these numbers into context, a previous similar study from the same area conducted in the late 1970s by Dr John Perran Ross found no evidence of marine debris ingestion in green sea turtles from Oman. This suggests a drastic and rapid increase in debris ingestion by marine turtles in the region. The reported high frequency of marine debris ingestion by hawksbill sea turtles examined in these studies is consistent with the literature which suggests that the omnivorous hawksbill sea turtles


Ingested by green sea turtles.


Ingested by loggerhead sea turtles.


Loggerhead sea turtles.

most frequently ingest marine debris, followed by the herbivorous green sea turtles, while carnivorous species (which includes olive ridley and loggerhead sea turtles) were the least likely to ingest marine debris.

In terms of quantities of ingested marine debris, we observed that green and loggerhead sea turtles do ingest the highest quantities of marine debris, particularly plastics. The results convey that green sea turtles are likely to ingest soft items such as threads (ropes, fishing lines and fishing nets) and sheets (plastic bags and plastic wrappers) because of their similarity to algae, seagrass, cuttlefish and jellyfish. On the other hand, loggerhead sea turtles appear more likely to favour hard items such as bottle caps and other hard plastics because of their similarity to gastropods and bivalves. Overall, when considering the amount, frequency and type of ingested marine debris, green sea turtles, particularly younger specimens, carry the highest risk of ingesting marine debris. The reason young green sea turtles may be ingesting so much marine debris is because young green sea turtles are opportunistic feeders with a very flexible diet consisting of both plants and animals. This flexible feeding habit may cause them to be less capable of discriminating their natural food from marine debris. Overall, plastics were observed to be the most predominant debris ingested in all species. While, non-plastic rubbish, particularly metallic fishing gear (fish hooks and gargour fish traps) were observed to present significant and lethal hazards by puncturing the digestive tract. In light of this, and previous studies, the evidence strongly suggests that marine debris as well as other pollutants are an important threat to marine turtles in the region.

Protection of marine turtles from ingesting marine debris cannot be separated from broader actions intended to prevent waste from escaping from waste management streams into the marine environment. Further work is needed on a policy level to halt the global stream of plastics and other waste products from entering the environment. Individuals from the general public have an important role to play as well. The high consumer demand for single-use plastics and other single-use products is a key factor behind the increasing levels of marine debris. Readers are encouraged to reconsider the unnecessary use of single use items, learn how to correctly recycle in their area and most importantly avoid littering behaviour.

برنامج الشارقة للاستجابة لجنوح الحياة البحرية

Sharjah Strandings Response Program

ABOUT SSRP:

Sharjah Strandings Response Program

Through the examination of stranded marine reptiles, marine mammals and sea birds, this programme, led by the Environment and Protected Areas Authority (EPAA), aims to expand the existing knowledge on the biodiversity, ecology and threats of marine fauna in the Emirate of Sharjah, UAE.

This knowledge would support the development of evidence-based conservation action and policy in the region as well as educate the wider public on the importance of conserving species and other emerging issues. Additionally, this programme acts as an important tool for the response and rescue of live strandings.

EPAA INVESTIGATES MASS STRANDING OF SEA SNAKES IN THE ARABIAN GULF

Sea snakes are marine reptiles that belong to the family Elapidae, the same family as terrestrial cobras. Globally, there are approximately 60 species of sea snakes, of which nine species are known to occur within coastal waters of the United Arab Emirates. Though sea snakes are the most diverse group of marine reptiles in the UAE, they have not enjoyed the same level of research effort and interest as marine turtles. Consequently, there is a disparity in public knowledge about the occurrence of sea snakes in the UAE and wider Arabian region. Sea snakes are rarely observed by the public as they spend their whole life at sea and will only strand (beach) if they are injured or dead. Such was the case in September and October of 2021.

During that period, the Sharjah Strandings Response Programme (SSRP), an initiative of the Environment and Protected Areas Authority (EPAA) of Sharjah, received numerous reports of sea snake strandings (alive and dead) across the beaches of the Sharjah Emirate. Unlike sea turtles which emerge on land to lay their eggs, sea snakes have no need to come ashore under any circumstance; thus when one becomes stranded, there is most likely an underlying illness or injury. When a report is received through the strandings response network, stranding responders are rapidly dispatched to rescue injured sea snakes or sample those that have died. Live sea snakes are provided with medical care by experienced EPAA veterinarians and herpetologists. The sea snakes then undergo treatment at the EPAA's Herpetology Department within the Breeding Centre of Endangered Arabian Wildlife until they are healthy for release. Dead sea snakes are examined by EPAA veterinarians and scientific researchers to determine the cause of death, along with gathering biological and toxicological data.

Though the EPAA has not yet concluded the cause of the mass strandings, archived data from previous years suggest that a lower number of sea snake strandings are a natural seasonal phenomenon. Sea snakes are shy and docile in the water, but when stranded they may feel vulnerable and, consequently, may be inclined to bite when touched. For members of the public, it is important that the following is considered during a stranded sea snake encounter:

1. Do not touch, move or poke the sea snake.
2. Do not push the sea snake back into the water, as stranded sea snakes will likely just wash ashore again.
3. Do not harm or otherwise persecute the sea snake.
4. Do not panic. Sea snakes do not have the ability to move on land and will not bite unless provoked by touching them. Sea snakes are venomous, but no reported cases of sea snake envenomation have ever been reported in the UAE.
5. Watch the sea snake for signs of movement, as this will aid the response team.
6. If you are in the Emirate of Sharjah, contact EPAA at:
   Tel: +971 6 504 7777
   WhatsApp: +971 56 216 3939
   State your location and send a photo of the stranding(s). If you are in another emirate, contact the relevant municipality or environmental authority.

هيئة البيئة والمحميات الطبيعية
Environment & Protected Areas Authority
SHARJAH الشارقة

ABOUT EPAA:
In line with the vision of His Highness Sheikh Dr. Sultan bin Mohammed Al Qasimi, Supreme Council Member and Ruler of Sharjah, the Environment and Protected Areas Authority, under the leadership of Her Excellency Hana Saif Al Suwaidi, aims to protect Sharjah's natural environment and conserve its rich biodiversity. This is achieved through data driven policies and increased public awareness and participation in supporting the principle of sustainable development to preserve natural and environmental capital to the benefit of present and future generations.

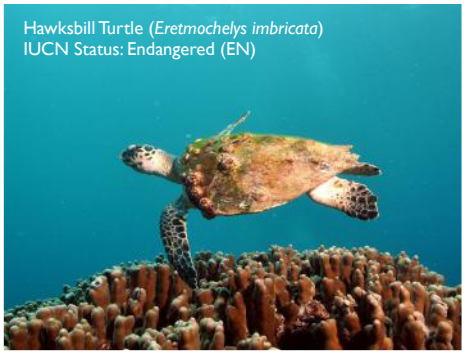
WEBSITE: www.epaashj.ae

SOCIAL MEDIA PLATFORMS:
www.twitter.com/epaa_shj
www.facebook.com/epaashj
www.instagram.com/epaa_shj

THE ENVIRONMENT AGENCY – ABU DHABI LAUNCHES THE ABU DHABI RED LIST OF WILDLIFE SPECIES REPORT

BY **ENVIRONMENT AGENCY – ABU DHABI**


Crab Plover (*Dromas ardeola*)
IUCN Status: Vulnerable (VU)


Hawksbill Turtle (*Eretmochelys imbricata*)
IUCN Status: Endangered (EN)


Indian Ocean Humpback Dolphin (*Sousa plumbea*)
IUCN Status: Vulnerable (VU)


Arabian Tahr (*Arabitragus jayakari*)
IUCN Status: Critically Endangered (CR)


Umbrella Thorn Acacia (*Vachellia tortilis*)
IUCN Status: Endangered (EN)


Blanford Fox (*Vulpes cana*)
IUCN Status: Critically Endangered (CR)

Abu Dhabi, 21st of September 2021: The Environment Agency – Abu Dhabi (EAD) recently launched the first ever Abu Dhabi Red List of Wildlife Species, (AD-RLS) which is an assessment of the threat status of the emirate's terrestrial and marine species.

The development of the Abu Dhabi Red List of Wildlife Species is the outcome of a project undertaken by the Agency to understand and assess the risk faced by groups of species found in Abu Dhabi.

A total of 244 species were assessed, including 101 plants, 49 birds, 9 marine species, 32 terrestrial mammals, 25 invertebrates, 26 reptiles and 2 amphibians. Out of the 244 species assessed, 74 are under different threat categories, such as critically endangered, endangered, and vulnerable.

Her Excellency Dr Shaikha Salem Al Dhaheri, EAD's Secretary-General said, "The Abu Dhabi Red List is a welcome addition to our knowledge on the threat status of species found in Abu Dhabi. The Abu Dhabi Red List is based on the internationally recognised Red List Criteria, developed by the International Union for Conservation of Nature (IUCN) and the assessments of threat status have gone through extensive external review from a team of experts from the IUCN, the Red List Authority, and independent experts.

"Abu Dhabi has a rich diversity of species and has some of the most important species. Their populations are effectively protected by the Agency through managing the largest network in the region of protected areas to conserve endangered species and their natural habitats. However, understanding the risk and evaluating the threats faced by them as well as other species, will help us better protect them."

Ahmed Al Hashmi, Acting Executive Director, Terrestrial and Marine Biodiversity Sector said, "The Abu Dhabi Red List of Wildlife Species has been long overdue, and it is an important addition to our understanding of the threats to the species in line with the global standards of the IUCN.

"The Abu Dhabi Red List also complements the National Red List development. undertaken by the Ministry of Climate Change and Environment and is consistent with the development of such lists at local, national and regional levels."

Commenting on the Abu Dhabi Red List of Wildlife Species, Dr Salim Javed, Acting Director, Terrestrial Biodiversity and Manager of the Red List Project at EAD said, "The Abu Dhabi Red List is the outcome of the evaluation of extinction risk of over 244 species, based on quantitative criteria. It is an important first step towards understanding the conservation status of Abu Dhabi's biodiversity.

"With 30% of the total assessed species classified as threatened, the Abu Dhabi Red List will help the Agency to prioritise conservation actions for some of the most threatened species in the emirate, which may include developing more systematic monitoring as well as species-specific conservation action plans in order to protect them Dr Javed added."

He further explained how the Abu Dhabi Red List of Wildlife Species is an excellent example of capacity building, as assessments were undertaken by a team of scientists from the Agency's Terrestrial and Marine Biodiversity Sector, with support from the IUCN's Species Survival Commission (SSC) and Provita. As a result, this will help EAD in undertaking such assessments in future to evaluate the status of species, measure effectiveness of conservation actions taken and guide the Agency in effective decision making to protect threatened species.

Within one of the largest programmes for species' reintroduction in the world, EAD has undertaken some of the most ambitious and successful projects to reintroduce species that were on the brink of extinction such as the Arabian Oryx and Scimitar-horned Oryx, and Abu Dhabi now houses the largest herd of Arabian Oryx in the world. The Shaikh Zayed Network of 13 terrestrial and six marine protected areas, managed by the Agency, provides protection to some of the most threatened and important terrestrial and marine species and their habitats. Furthermore, EAD has a plant nursery with a production capacity of nearly 500,000 plants annually and has more than 70 different native plant species propagated to date. These plant species include many rare and threatened species and are used for habitat restoration efforts across the Emirate. EAD has successfully rehabilitated important plant species such as the Al Sarh, Ghaf and Samar trees in their natural habitat to ensure that they continue to remain part of the Emirate's landscape and its cultural heritage.

EAD MONITORS ONE OF THE RAREST BLUE HOLES IN THE WATERS OF THE AL DHAFRA REGION

BY **ENVIRONMENT AGENCY – ABU DHABI**

Abu Dhabi, 9th of October 2021: During its regular surveys and assessments, the Environment Agency – Abu Dhabi (EAD) recently monitored one of the rare blue holes located in the waters of the Al Dhafra region in the Emirate of Abu Dhabi. The perimeter of the Al Dhafra Blue Hole is approximately 300 metres long and 200 metres wide, encompassing a total area of around 45,000 square metres.

Preliminary analysis of the seabed area forming the centre of the Al Dhafra Blue Hole, indicates a depressed, semi-circular area roughly around 5,000 square metres. The semi-circular area topography is flat with a maximum depth of 12 metres and has a bottom composition combination of silt and sand.

This unique habitat holds at least 10 types of coral species, forming a reef at the edges of the hole. The blue hole is also home to many fish communities and provides shelter for a variety of fish such as Grouper, Sweetlips, Emperor Fish and Jackfish. This rare blue hole is significantly important, as it provides a glimpse of how historic reefs used to look like in Abu Dhabi.

To enhance the Agency's understanding of the localised marine ecosystem, and better characterise geological composition of the blue hole, an environmental assessment survey will be conducted. Assessment of environmental parameters, including geological mapping of the area, seawater chemical parameter analysis, and physical composition of the seabed, will facilitate an informed characterisation of the blue hole. In addition, to better determine the health of the existing coral reef community and assess localised ecosystem health, EAD will continue to conduct scientific and topographic surveys to further understand this unique natural phenomenon.

The blue hole is a natural phenomenon characterised by a deep marine depression compared to the shallow areas that surround it. The deepest blue hole, The Yongle, lies in the South China sea and reaches 300 metres. Other internationally famous blue holes include the Great Blue Hole in Belize, Gozo's Blue Hole in Malta, the Blue Hole at Dahab in Egypt and Dean's Blue Hole in the Bahamas.

These unique structures attract divers from all over the world and are home to fringing reefs and diverse fish species, and at their depths, they host diverse microbial communities.

EAD AND ENGIE LAUNCH PHASE 2 OF THE MANGROVE REHABILITATION PROJECT USING DRONE TECHNOLOGIES

BY **ENVIRONMENT AGENCY – ABU DHABI**

L-R: Dr Shaikha and Florence Fontani making seedballs for the project; Dr Shaikha, Florence Fontani and Jane Glavan. Jane is explaining why and how to make the seedballs; group photo; Dr Shaikha, Florence Fontani, Ahmed Al Hashmi learning more about the drone used for planting the project.

Abu Dhabi, 27th of September 2021: The Environment Agency – Abu Dhabi, (EAD) in partnership with the global energy company ENGIE, today announced the launch of the second phase of the "Blue Carbon" Environmental and Social Responsibility project, during an event led by Her Excellency Dr Shaikha Salem al Dhaheri, Secretary General of EAD. After a successful pilot launch in 2020, the second phase of the project involves using highly innovative drone planting technology to sow mangrove seeds.

Her Excellency Dr Shaikha Salem al Dhaheri said, "Mangroves play a critical role in our fight against climate change. These carbon-rich forests that dot the coastline of Abu Dhabi are key to stabilising our environment and preserving the natural habitat of several species. The Blue Carbon project is one of its kind in the region and I am delighted that it has advanced to Phase 2, following its very successful pilot launch in 2020. Rebuilding and restoring an ecosystem that resiliently protects our coast will support the sustenance of mankind while consequently combatting climate change."

Hosted at the EAD Headquarters in Abu Dhabi, the event was attended by the Blue Carbon project team from EAD, ENGIE, and its partner, Distant Imagery, who are specialists in engineering drone solutions that are based on blue carbon restoration expertise. They have also designed and engineered drone rigging in the UAE.

All attendees collaborated and participated in making seedballs, which help protect the seeds when they are launched from the drone, as well as provide nutrients to ensure proper germination of the seeds when planted in the soil.

The project was initiated last year in a very successful test pilot where approximately 2,000 seeds were planted. Almost one year after the first planting, the success rate is estimated to be 25%, despite the volatile weather conditions of last year. Implementing the learnings from last year, supported by an advanced drop mechanism and methodology, this year, the project team expects a success rate of at least 35%. These are excellent results if compared to the typical mangrove survival rate in nature of 5%.

As part of the second phase of the project, plant seeding will take place earlier in the season, from early September, to ensure they are given an increased chance to stabilise and grow. There will also be a change in seeding time, to ensure seeds are captured with the highest chance of survival.

Ahmed Al Hashmi, Acting Executive Director for Terrestrial and Marine Biodiversity at Environment Agency – Abu Dhabi said, "Restoring biodiversity and preserving vulnerable ecosystems is not a choice anymore but a necessity for the survival of humankind, in the wake of climate change. With this in mind, we are glad to be working with ENGIE on this project. To us, this project is a direct extension to The UAE's National Blue Carbon Project and The Abu Dhabi Blue Carbon Demonstration Project that was launched in 2012, that focused on mapping the UAE's carbon sinks extensions and capacities."

Commenting on the project, Florence Fontani, Chief Communications and Sustainability Officer, ENGIE Africa, Middle East, and Asia (AMEA), said, "Our partnership with EAD and Distant Imagery for this project sets an example to better engage to achieve carbon neutrality and address challenges in preserving coastal and marine ecosystems for human life. At ENGIE, we are honoured to be part of this project and support the country's goals towards conserving the rich environmental ecosystem for the generations to come."

IN ALIGNMENT WITH UAE GOVERNMENT VISION,
EAD LEADS SEVERAL PROJECTS TO COMBAT CLIMATE CHANGE IN ABU DHABI

Abu Dhabi, 15th of November 2021: As part of its commitment to the UAE Government's sustainability vision, the Environment Agency – Abu Dhabi (EAD) is leading a range of projects that will help curb the impact of climate change.

Following the announcement in October by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister and Ruler of Dubai, regarding 'UAE Net Zero 2050', a strategic initiative to achieve climate neutrality by 2050, EAD took the lead in Abu Dhabi to help realise the initiative's goals.

To achieve climate neutrality by 2050, EAD affirms that reducing residual GHG emissions in sectors that pose challenges to decarbonisation using natural and artificial carbon sinks, as well as advancing Abu Dhabi's economic diversification agenda through innovative low-carbon solutions, is the way forward.

Her Excellency Dr Shaikha Salem Al Dhaheri, Secretary General of EAD, said, "The concept of climate change is not new to EAD, and we are in the process of devising a Climate Change Mitigation Policy for the emirate of Abu Dhabi, in collaboration with all our significant partners. This policy targets head-on the adverse effects and prospects of climate change in Abu Dhabi. It will factor in socio-economic and cultural catalysts while oscillating between the environmental conservation needs of the Emirate. The policy will also be the premise upon which we will base our transformation of the UAE Net to Zero 2050 Strategic Initiative into local and tangible implementation plans."

She added, "We play multiple roles in the drive to combat climate change. This involves improving the data collection process through the use of technology, innovation, artificial intelligence and spatial techniques, and providing data and information services related to greenhouse gas emissions, primarily carbon dioxide."

"We also clarify mitigation measures related to minimising the impacts of the different sectors, including health, water and infrastructure on the environment, and the development of ways to reduce impacts on species, habitats and ecosystem services which need to be aligned with the objective of combating climate change."

She elaborated, "On a strategic level, the Abu Dhabi Government has worked on the development and implementation of a cross-sectoral environmental plan that covers climate change, air quality, water, waste, biodiversity and other elements. Since environmental and natural resource management is a multi-stakeholder issue, the strategy was not developed for EAD alone, but also included relevant entities and institutions from the private sector, educational institutions, development partners and other concerned organisations. The goal of the strategy is to integrate environmental issues into policies, action plans and investment plans at the institutional and Emirate levels, and we are enroute to making this strategy come to life in Abu Dhabi."

In alignment with the Abu Dhabi Government objectives, climate change mitigation is already one of EAD's top strategic priorities and as part of its new five-year strategy 2021-2025, the Agency is working towards "securing the resilience of Abu Dhabi through mitigation and adaptation to climate change, and protection of our air and marine water." Within the mandate of this priority, EAD has been developing and executing several projects to curb climate change in Abu Dhabi.

Since 2010, with the support and participation of all sectors, EAD has been preparing an emissions inventory report based on the best international methodologies. The report

includes the results of Green House Gas (GHG) emissions inventories at the emirate level, which are constantly updated as part of the Agency's comprehensive plan to monitor emissions. This would help support the federal government to fulfill its obligations towards the United Nations Framework Convention on Climate Change. It also enhances the capabilities of local authorities to track and manage their emissions.

These inventories contribute to creating a robust and constantly updated database that allows researchers and policy makers to understand changes in emissions and formulate sound local policies to improve air quality and reduce the impact of climate change.

The emissions inventories in the Emirate of Abu Dhabi are the first of their kind in the region in terms of application at the level of the emirate, and in terms of the comprehensiveness of the inventory to all sources of emissions. They include the energy, industry and waste sectors, and the method of implementation is based on the application of the latest international standards and practices and partnership with all parties.

The inventory includes a comprehensive inventory of all sources, sinks and levels of GHG emissions in the Emirate of Abu Dhabi. It provides an assessment of a future vision for the year 2030, and an update of the inventory process once every two years. The process is in accordance with the guidelines of the Intergovernmental Panel on Climate Change.

During the coming period, the results of the fourth cycle of the inventory will be announced, which was completed based on the project's work plan and the methodology of the Intergovernmental Panel on Climate Change (IPCC).

In addition, EAD has several programmes that support the multi-layered aspects of climate change. These cover policy and regulation development, enforcement, monitoring and management. However, climate change management is, indeed, a cross-sectoral responsibility that needs the engagement of all sectors.

EAD has implemented initiatives to develop natural carbon sinks and enhance environmental resilience through the study of blue carbon, which was reviewed at the Conference of the Parties to the Framework Convention on Climate Change 21, and the planting of 14 million mangroves through a project coordinated between the Department of Municipalities and Transport and the Al Dhafra Region Municipality. It is expected that the planting of these trees during the next 25 years will contribute to storing approximately 200 thousand tons of carbon emissions, which is equivalent to the annual energy consumption of more than 20 thousand homes. In addition, mangroves provide environmental benefits that help reduce the impact of climate change.

Consecutively, a first in the region Fish Carbon Analysis pilot project was implemented and involved marine mammal experts and leading academics from the region. This exploratory study represents a preliminary test case of carbon stores from marine vertebrate biomass in the United Arab Emirates with a focus on the Emirate of Abu Dhabi. It used existing data sets and methodologies to assess blue carbon values in the seas by determining the capacity of fish, whales, dugongs and sea turtles and seabirds that live in the marine environment of the Emirate of Abu Dhabi to store carbon.

The study found that the current stock of carbon in the biomass of marine mammals, sea turtles and seabirds in the Emirate of Abu Dhabi is estimated at 520 tons. This is roughly equivalent to the carbon storage potential of biomass lost (532 tonnes) across fisheries in Abu Dhabi Emirate in 2018.

As a pilot study, the results of the project will allow relevant decision-makers in the UAE to evaluate options for the possible implementation of blue carbon policies at the local and national levels.

Similarly, EAD has also implemented a project to plant 2 million mangrove trees along Abu Dhabi's coastal areas (between Al Mirfa and Thumairah), in order to mitigate the effects of the deterioration and loss of mangrove habitats resulting from development activities, and to develop natural resources with a high potential for carbon storage and sequestration.

Furthermore, EAD will also continue supporting the development, implementation and adoption of low-emission vehicles in Abu Dhabi, starting with the Government fleet, in collaboration with relevant stakeholders. EAD will also work with the Department of Municipalities and Transport (DMT) and the Integrated Transport Centre (ITC) to provide environmentally-friendly public transport and promote more activities such as walking and cycling.

Moreover, EAD will examine the feasibility of replacing buses, taxi cars and waste management refuse trucks with electric power alternatives and coordinate with relevant entities to introduce incentives for personal vehicle electrification. This is in addition to the incentive-based replacement of old buses and trucks, which are the highest polluting and less efficient vehicles, as well as upgrading delivery motorcycles to electric versions.

EAD is working with relevant stakeholders to articulate clear emission reduction plans for specific sectors, pollutants and non-attainment areas that are of clear concern to air quality levels. This includes self-regulating sectors such as oil and gas. Furthermore, EAD will continue to close gaps in concentration limits for specific air pollutants and address gaps in sector-specific emission limits, especially for mobile sources.

EAD is also actively seeking to leverage opportunities by engaging with the private sector on important topics pertaining to the environment through Public-Private partnerships. It achieves this through its unique multi-stakeholder engagement initiative – Abu Dhabi Sustainability Group (ADSG).

Established in 2008 by EAD, ADSG is the only sustainability platform in the region that allows all people from different backgrounds to connect on the future sustainability of communities and businesses. It is also the platform for government, industry and non-profit organisations to work together to enact positive change. Today the Group has over 53 leading organisations working together to deliver social and environmental commitments for the benefit and future sustainability of the UAE.

Over the last decade, the ADSG has focused on capacity building and knowledge sharing, by funding certified training programmes and events and workshops attended widely by regional sustainability practitioners. In the next decade, the ADSG will be more focused towards 'integrating sustainability governance to achieve impact addressing sustainability governance, climate change and sustainable economies. ADSG will also work towards corporate thought leadership that aims to encourage business leaders to make a fundamental shift towards resilient business models that support a sustainable and carbon neutral economy.

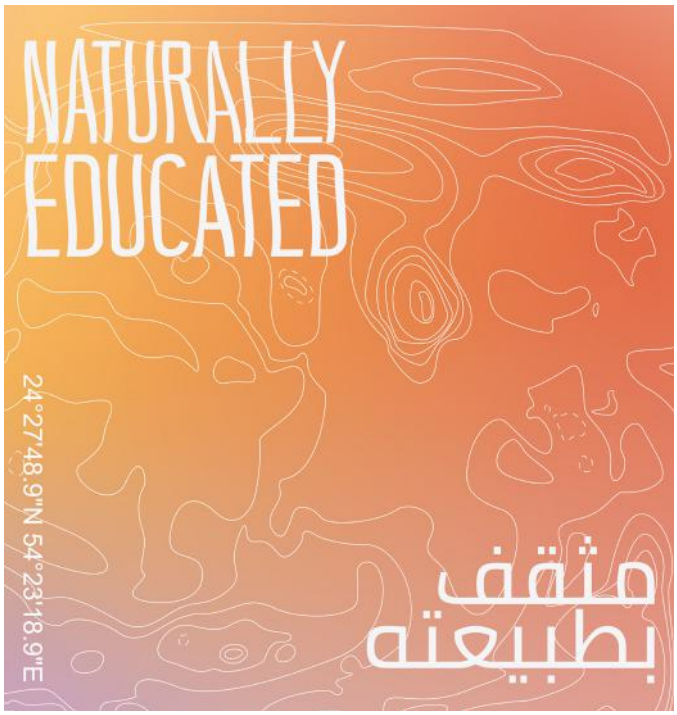
Also, as part of its awareness programmes, in 2019, EAD launched the Green Enterprise Network, which includes a group of institutions committed to environmental issues. This network also encourages the promotion of dialogue and cooperation between government and private agencies in all fields, through the assessment of greenhouse gas emissions, resource sharing, best practices and case studies.

These are only a few of the initiatives curated by EAD, and the Agency pledges to continue its work towards mitigating the effects of climate change, in full alignment with the UAE government and the rest of the world to mitigate this global threat.

EAD LAUNCHES A NEW SERIES OF PODCASTS

Abu Dhabi, 15th of November 2021: The Environment Agency – Abu Dhabi (EAD), in partnership with Borouge, has launched a podcast as part of a series of episodes titled 'Naturally Educated' that is focused on significant environmental topics, hosting experts who will be sharing their knowledge and experience on the podcast, which will be hosted on EAD's Sustainable Campus Initiative (SCI) – a youth-focused website.

The first episode has been released, with EAD planning to produce several other episodes based around a wide range of topics that aim to inspire, share knowledge, and serve as a tool used in university curricula and that can support research and project-based learnings.



EAD's first guest was Humaid Abdulla Kanji, an Environmental Economist in the Integrated Environment Policy & Planning (IEPP) Sector at the Agency and dedicated to the important topic of climate change. With climate change increasingly impacting the environment, Al Kanji discussed the better choices everyone can make and what is currently happening on the ground as part of the effort to tackle the issue. He also discussed how the challenge of climate change has shifted since the COVID-19 pandemic.

From air pollution and biodiversity loss, to sustainability, circular economy, and climate change, EAD's podcast will tackle a range of challenges facing the planet today. The Agency believes that within every challenge lies an opportunity to do better and improve the status quo when it comes to environmental work.

Leveraging their subject knowledge, research, and insights, EAD experts will inform their audience about what needs to be done on the ground to be able to restore and recover the environment's ecosystem, and for the planet to truly thrive in the decades and centuries to come.

EAD selected podcasts as a tool for learning as it helps youth better understand topic concepts, and not to just remember them, plus they help engage younger viewers and expand their knowledge base.

Additionally, youths who are less informed regarding the environment and sustainable living can come away with better awareness and understanding about what it means to create a sustainable future, which is EAD's main mandate. The podcasts are designed to increase awareness around environmental sustainability and encourage young people to take action in the community. Khansa Ibraheem Al Blouki, Director, Environmental Outreach Environmental Information, Science & Outreach Management Division at EAD on the occasion said, "At EAD we always strive to be progressive and in tune with the most popular media channels of today. As such, we decided to develop a series of podcasts because we know that as a medium it is very effective in reaching our young people. In fact, studies have proven that podcast listeners trust podcasts more than traditional media, and we are aware that youths are shifting away from traditional media towards a digital world, and we want to capture and engage with this movement."

Khansa added, "We have meticulously selected the hosts who we believe would be credible and who have a solid following of our target audience. We have also carefully chosen our experts from within the Agency that we believe can provide scientific, informative and interesting data about all the hot environmental topics resonating around the world."

She elaborated, "Podcasts are an informative channel that build a sincere association with the target audience and will help us to reach out to the community. We believe that this medium encourages creative learning, unlike the traditional pedagogic methods of education, podcasting gives a way to new strategies through guest lectures, interviews, videos and demonstrations to name a few. This helps to encourage students to develop their own podcasts, improve their listening skills, and enhance their learning by targeting their areas of interest."

Maitha Al Marashi, Vice President of sustainability from Borouge said, "It is always a pleasure for us at Borouge to once again partner with the Environment Agency – Abu Dhabi on innovative and community-driven environmental initiatives as part of our CSR campaigns. We are very excited about the utilisation of podcasts as a tool to discuss and share with the community important topics related to the environment in a manner that is not generic. The youths of today prefer to watch or listen to data and through this series of podcasts we will be better prepared to engage with them and attract them to take action."

She also added, "Youths are the future of sustainability and the future advocates for controversial topics such as climate change, the conservation of biodiversity and living in harmony with nature to name a few, and through these podcasts they will be more informed and enlightened in order to take the torch forward into the future as leaders in the field of environment."

The two hosts for the EAD podcasts are: Sheikh Dr Majid Al Qassimi, who is a Director of Animal Health and Development from the Ministry of Climate Change and Environment and sits on the advisory Board of the UAE University College of Food and Agriculture, and Abdul Rahman Al Zaabi, holder of a master's degree in renewable Energy from Masdar Institute in Abu Dhabi.

Regarding upcoming episodes, the second episode features Rashed Mohamed Al Zaabi, who is a Scientist in the Terrestrial and Marine Biodiversity Sector (TMBS) at EAD. With protected areas at the core of the fight against climate change, he talked about their significance in biodiversity conservation and the ecosystem, discussing how biodiversity can be viewed differently to make it more accessible and an everyday topic.

The third episode will be an interview with Maitha Mohamed Al Hameli, who is a Lead Specialist in Marine Threatened Species and Habitats at the TMBS Sector in EAD. With biodiversity playing an essential role in the ecosystem, she discussed the present factors that have led to a loss in biodiversity, highlighting the key methods used to conserve biodiversity across the UAE.

ADAPTABILITY OF PADI'S DIVING PROGRAMME
HELPING VETERANS HEAL

PADI® Members around the world are helping veterans heal, both physically and mentally, through the techniques learned in the PADI Adaptive Support Diver and Adaptive Techniques Speciality courses. PADI aims to help active-duty military personnel and veterans across the globe, along with the many PADI Members who offer dive programmes to support them. In addition to the confidence building and life changing aspects training as a PADI diver offers, diving can also heal.

"We are committed to increasing access to the underwater world for everyone and believe that the transformational power of learning to dive can benefit the emotional and physical well-being of all humanity," says Kristin Valette Wirth, Chief Brand and Membership Officer of PADI Worldwide. "Promoting health and wellness through diving is a key focus area of PADI's People and Humanity Pillar of Change, with the primary objective to remove barriers and increase access to diving for all."

According to the World Health Organisation, there are around one billion people on the planet who are living with some sort of disability – mental or physical. PADI's courses have always allowed and encouraged adaptive techniques, but with the launch of PADI's Adaptive Techniques Speciality Course in 2018, the inherent flexibility of PADI courses for people with disabilities was better highlighted. This has helped instructors learn how a simple technique change can allow more divers to meet performance requirements and earn a PADI certification. Instructors learn how to implement techniques to leverage the strengths of their students and help each one overcome their unique challenges, thereby providing greater access to diving for all.

This summer, PADI teamed up with Patriots for Disabled Divers, a non-profit organisation founded by Jeff and Merial Currer, who own PADI Five Star Instructor Development Centre Patriot Scuba in Virginia, USA, to certify retired U.S. Army SGT Bryan Anderson as a PADI Open Water Diver. Anderson completed his course in Catalina Island, California on the 20th anniversary of his deployment to Iraq, where he was injured by an Improvised Explosive Device (IED) that resulted in the loss of both legs and his left hand. Bryan received rehabilitation for a period of 13 months at Walter Reed National Military Medical Centre and is one of the few triple amputees to have survived his injuries in Iraq. Anderson was awarded the Purple Heart because of his injuries.

BRYAN ANDERSON'S STORY

It was Robert 'Bob' Taradash, Bryan's former Battalion Commander in Iraq, that first introduced the idea to Bryan and was instrumental in helping Bryan become a certified diver, serving as both an instructor and dive buddy throughout Bryan's certification journey. Now an active PADI IDC Staff Instructor and the Executive Director of Patriots for Disabled Divers, Bob wanted to recruit Bryan into diving because he knew that showing the world that Bryan could dive would be a powerful motivator for many people.

"Our relationship, that camaraderie, that desire to be there for each other is what brought us together to dive in Catalina," explains Taradash. "Just by the fact of him doing this, it might inspire others – disabled or not – to put on a tank, take their first breath underwater, and enjoy the undersea world. I think Bryan's story, in his adventure to breathe underwater, is going to be part of the lasting legacy in Bryan's journey to inspire others."

"You always have that thought in the back of your head, 'Well, maybe you're not going to get there. Maybe something will limit you,'" says Anderson. "But I worked through it, didn't panic, and being a triple amputee, I completed everything that I needed to become a certified PADI Open Water Diver. If you've had the thought like you might want to try diving and you're stopping yourself because your mind is stopping you and you think you can't, I want to show you that you can."

Anderson's recent journey with Patriots for Disabled Divers is just one of many around the world, with PADI Dive Centres and Resorts increasingly training their instructors with the PADI Adaptive Techniques Speciality Course and offering the PADI Adaptive Support Diver Course to those in the dive community.

"Scuba diving can have a tremendous impact on individuals diagnosed with PTSD. I see this transformation on a daily basis. Many of our PADI Pros have PTSD and there is a noticeable difference in them when they are actively diving. They have told me that when they get underwater, all the noise in their head goes quiet. They are happier and more social when they get out. Scuba diving is also very freeing for our students who spend a good bit of time in a wheelchair. They get underwater and experience a feeling of freedom they haven't felt in a long time and in some cases, ever," says Merial Currer. "For us working with people who never thought they could dive due to a disability, has been incredibly rewarding."

Read more about other PADI Members who are champion adaptive diver training on the PADI Pros Blog.

"Through the continued work of PADI Members supporting veterans through adaptive diving, their heroic journeys to become divers inspire us all. They prove that anyone can overcome barriers and try something with the power to transform their life," says Valette Wirth.

PADI'S CHRISTMAS GIFT GUIDE

Unexpected Experiential and Sustainable Gifts for Those Craving Adventure and a Healthier Ocean PADI®, the world's largest ocean exploration and diver organisation, has created a Christmas gift guide for adventure seekers and ocean lovers, with gift ideas including products and experiences to enjoy above and below the surface.

These gifts will not only make difference in your loved ones' life but also for the health of the ocean. From 30 November through 25 December 2021, 10% of all PADI eLearning® and PADI Gear™ sales will support the PADI AWARE Foundation™ to help save the ocean.

From new gear for the New Year to life-changing experiences and gifts that are simply too big to be wrapped, here are PADI's top picks for gifts that pay it forward to people and the planet.

1. THE GIFT OF A LIFETIME:

PADI OPEN WATER DIVER ELEARNING

£155 | www.padi.com/courses/open-water-diver

Gift a lifetime of underwater adventure with PADI online scuba diving lessons. With PADI eLearning®, they'll be able to start learning to dive online whenever and wherever it's convenient for them. After they finish the flexible online programme, they can complete their PADI Open Water Diver certification with a local PADI Dive Centre or Resort where they will work with a dedicated PADI Instructor to develop basic skills and confidence and gain a passport for a lifetime of underwater adventure. Kids as young as 10 years old can take the PADI Open Water Diver course, making it a great gift for the whole family or couples to build shared memories and experiences together.

*From 30 November – 25 December 2021, 10% of PADI eLearning purchases at www.padi.com supports PADI AWARE Foundation ocean protection programmes.

2. SUSTAINABLE STOCKING FILLERS:

PLASTIC FREE PADI GEAR

Stuff stockings with sustainable PADI Gear that is made for people who love the ocean and want to do their part in protecting it. So far, PADI has helped remove 1,829,940 plastic bottles from the ocean, which is equivalent to 26,588kg of plastic, through a range of PADI Gear products that are made from recycled ocean plastic and others designed to help eliminate plastic from entering the ocean.

*From 30 November – 25 December 2021, 10% of net proceeds from padigear.net supports PADI AWARE Foundation ocean protection programmes.

TOP PICKS INCLUDE:

RECYCLED PLASTIC FACE & SUN MASKS

£21.75 | www.padigear.net/collections/padi-face-masks

This eco-friendly, versatile face and sun mask made from recycled ocean plastic can be worn in nine different ways – as a mask, bandana, balaclava, beanie, wristband, neck gaiter, hood, head wrap or neckerchief. You'll be protected from the external elements and have serious mermaid vibes no matter what activity you do. One mask contains the equivalent of 10 plastic bottles.

RECYCLED PLASTIC CLOTH FACE MASK

£13.76 | www.padigear.net/collections/padi-face-masks

Choose from a range of eco-friendly and adjustable face masks made of multiple layers of tightly woven fabric spun from recycled ocean plastic with breathable and cooling technology, an antimicrobial treatment and come equipped with optional filter pockets. One face mask contains the equivalent of 2 plastic bottles and one hand sanitizer uses ZERO plastic bottles.

MIKE COOTS PADI COLLECTION TYVEK POUCH

£19 | www.padigear.net/collections/padi-x-mike-coots

Keep all your essentials in this re-usable pouch made from recyclable Tyvek® material. Both water resistant and reversible, it is lightweight, feels like fabric and has a long life span. This special edition pouch features an image by Mike Coots, PADI AmbassaDiver and award-winning photographer committed to protecting sharks and educating people on the importance of their role in a balanced marine ecosystem. One pouch is equivalent to using ZERO plastic bags.

PADI LEUS RETRO DIVE FLAG TOWEL

£30 | www.padigear.net/collections/towels-ponchos/products/padi-x-leus-retro-dive-flag-eco-friendly-towel

With a soft, cosy and absorbent texture, it's hard to believe this towel is made from recycled plastic bottles! Ideal for those who love adventure above and below the surface, the Leus Dive Flag towel is the perfect gift for anyone who wants to show kindness to our planet and prevent microplastics from entering the ocean. One recycled towel contains the equivalent of 12 plastic recycled bottles.

PADI X KLEAN KANTEEN INSULATED BOTTLE

£28.80 | www.padigear.net/collections/drinkware/products/padi-x-klean-kanteen-insulated-20-oz-bottle-matte-black

This gift is doubly good for the planet. Ditch the need for plastic bottles and help save marine life with a PADI x Klean Kanteen Insulated Bottle. Made with a non-toxic solution that keeps your beverage iced for up to three days and warm for nearly 24 hours, each bottle is lightweight and backed by the lifetime Strong as Steel guarantee. One re-usable bottle is equivalent to using ZERO plastic bottles!

PADI TRSHBG OCEAN CLEANUP BAG

£45 | www.padigear.net/collections/bag/products/trashbag-hip-black

For those who want give back to the ocean on every dive, give them the gift of a PADI Trshbg Ocean Cleanup Bag. This sustainable bag attaches to your hip and leg and is designed to easily remove marine debris and still allow for neutral buoyancy.

3. A GIFT THAT FUELS THEIR PASSION:
PADI CONTINUING EDUCATION ELEARNING
£155 Purchase at www.padi.com/courses/advanced-open-water

For the certified diver in your life, help them continue their passion for underwater exploration. The PADI Advanced Open Water Diver eLearning programme is the next step after Open Water and the gateway to improving skills and speciality courses such as underwater photography, Dive Against Debris® and wreck diving. A variety of other continuing education eLearning programmes are available to pique their interests and passions.

4. THE GIFT OF EXPLORING THE PLANET:
PADI TRAVEL DIVE TRIP
Book at www.travel.padi.com

This gift is too big to actually wrap, but is the ultimate option for those with a wanderlust soul above and below the surface. Give the gift of exploration with a dive holiday with PADI Travel, where trips around the world can be booked with PADI Dive Resorts and Liveaboards. From trips that are perfect for families to remote getaways for couples that allow them to disconnect and just dive, this gift gives options for exploring anywhere on the planet, with hundreds of holiday deals and travel collections to choose from.

AN ECO-WARRIORS CLEAN-UP

BY **RAJNI GUPTA – JUMEIRAH PRIMARY SCHOOL** PHOTOGRAPHY **ALLY LANDES**

The JPS Eco-Warriors are a team of children aged between 8 to 11 at Jumeirah Primary School who work across school creating positive change to help the environment. Switching off lights before playtime, collecting books to donate to schools in Africa (giving the books new life), and collecting plastic bottles and paper to send for recycling are just a few of the initiatives driven by the team.

This passionate team of students work proactively together, taking steps to enhance global awareness, which is why the JPS Eco-Warrior team – led by Deanna Richardson and with the support of EDA – organised an after-school beach clean-up on Thursday 11th November 2021 on Sunset Beach.

With our planet almost 70% under water, the younger generation realises the severity of losing access to clean beaches and the effect it will have on their well-being, as well as the generations to come. They also have overwhelming concerns about the effects it will have on the marine life.

The entire day was dedicated to earth conservation: in the morning, the children watched the documentary 'The Story of Plastic', which they raised valid questions about how recycling is NOT the solution and discussed the devastating effects of improperly segregated waste; single-use plastic; the release of toxins during the process of recycling on our environment, and how toxins know NO boundaries. They are not limited to a particular nation hence waste management being a global issue.

An enthusiastic team of forty students, who now look to educate forty families, led the mission to educate ten new individuals, who will in turn multiply their reach outwards to ten new individuals, sharing missions such as, 'Say No to Single-Use Plastic' and 'Waste-Free Wednesday', suggesting if not a ban on plastic, then at least a choice of wisely reusable materials at a consumer level.

In the afternoon, the expanding team (along with their parents) gathered to split into smaller groups and cover various areas of Sunset Beach to collect waste using reusable bags and reusable protective gloves provided by the EDA team. To encourage the children, their principal, Mrs Higgins, came along with the children to pick up the trash with her own kids; rearticulating the importance of working together for a better future.

A total of fifteen teams spent 120 minutes on the beach with the support of friends and family, each team consisting of approximately five members, both children and adults.

A total item count of 1,588 was collected by sixty people in total.

This is just the beginning: the JPS Eco-Warriors are determined to make a difference.

JUMEIRAH PRIMARY SCHOOL DUBAI BEACH CLEAN-UP

MOST LIKELY TO FIND ITEMS	TOTAL
Cigarette Butts	665
Food Wrappers	132
Plastic Take-out Containers	27
Foam Take-out Containers	34
Plastic Bottle Caps	100
Metal Bottle Caps	12
Plastic Lids	12
Straws	33
Forks/Knives/Spoons	15
Plastic Beverage Bottles	52
Glass Beverage Bottles	7
Beverage Cans	2
Plastic Grocery Bags	22
Other Plastic Bags	16
Paper Bags	4
Paper Cups & Plates	7
Plastic Cups & Plates	23
Foam Cups & Plates	8
FISHING GEAR	
Fishing Buoys, Posts, Traps	3
Fishing Net & Pieces	2
Line (metres)	27
Rope (metres)	16
OTHER TRASH	
Balloons	1
Paper	5
Cardboard Boxes	1
Construction Materials	15
PACKAGING MATERIALS	
6-Pack Holders	1
Other Plastic/Foam Packaging	49
Other Plastic Bottles	8
Strapping Bands	8
PERSONAL HYGIENE	
Diapers	11
Syringes	1
Masks	2
Plastic Gloves	7
TINY TRASH (< 2.5 cm)	
Foam Pieces	106
Plastic Pieces	154
TOTAL NO. OF ITEMS:	**1,588**

MY PASSION FOR SCUBA DIVING

BY **ETHAN WAMSLEY – 12 YEARS OLD** (JUNIOR PADI MASTER SCUBA DIVER)

AN INTRODUCTION

Scuba Diving. Have you done it before? I think you should (if you haven't). It's opening up into a whole new world as you plunge into the depths of the ocean, observing the many aquatic species of aquatic life, experiencing one of Mother Earth's beautiful phenomenons.

THE START TO MY SCUBA DIVING

My passion for scuba diving all started when I was 8 years old. I was in England, in a swimming pool during my summer holiday, about to go and try out scuba diving for the first time in my life with a Bubblemaker course. At first, I was a bit unsure to what scuba diving was (since I was only 8) and, I tried it and I absolutely LOVED it! The next time I went, I saw another boy who came to try it, and together we had so much fun underwater. After this, I wanted to scuba dive every time I saw water. I think that all kids should be able to experience scuba diving and breathe underwater. If you haven't tried it yet, you should definitely give it a go because you'll never know if you like something or not, until you've tried it.

THE NEXT STEP

2 years later, at the age of 10, I was able to start my PADI Junior Open Water course. I spent many days and weekends going with my Dad (who has been scuba diving for many years) to the Sandy Beach Dive Centre in Fujairah. Within a few weeks, I became an Open Water PADI Scuba Diver. I was so excited. After I became a qualified scuba diver during COVID, my Dad and I would go scuba diving on the weekends to enjoy ourselves underwater and explore all the different dive sites looking for reef sharks (harmless), turtles, all kinds of fish, colourful corals etc. Every dive was like a new underwater adventure. Within a few months, I'd been diving so much with my Dad that I wanted to challenge myself more, so I took up some speciality courses – Underwater Photography, Peak Performance Buoyancy, Underwater Naturalist, and Enriched Air (Nitrox).

After about 30 dives in one year, the next step for me was to do my PADI Junior Advanced course, but I couldn't do this course until I was 12 years old – which was a long wait for me!

On the 17th of September, 2021, the wait was finally over and I was old enough to do my Advanced PADI course. On my 12th birthday I asked my Dad to take me to the Sandy Beach Dive Centre so I could start my advanced course, which he did. I finished the course including the Deep Dive and Wreck Dive, and I completed all the study requirements. I really enjoyed the advanced learning and wanted to learn more and set myself a goal of becoming a Junior Master Scuba Diver. I knew this would not be an easy task, but I love diving so much that I wanted to study, learn and have more adventures in the ocean to achieve my goals.

The next course for me was the Rescue Diver course which was very tough. The learning was fantastic and I learned things that I never knew before, such as water rescue procedures, helping panicked divers, CPR on adults and children, administering oxygen, as well as weather conditions and dive incident prevention. After many days of studying, dive training and exams, I passed my Rescue diver course, which meant I was one step closer to being a Junior Master Scuba Diver (MSD).

AT LAST!

Fast forward from when I started scuba diving 4 years ago, I achieved my Jr MSD qualification when I was 12 years and 33 days old. I got my Jr AOW, the day after my birthday and then, 2 weeks later, I got my Jr Rescue Diver certification, my 5 specialities and my 50 dives (leading to Jr MSD)! I'm extremely happy and proud to be one of the youngest Master Scuba Divers in the World, and I would like to thank the many people that have supported me in my scuba diving. The best dive buddy in the world (my Dad); my Mum, for always allowing me to go scuba diving with my Dad after I'd finished my homework; my instructors (and friends) at Sandy Beach Dive Centre – Milan, Lux, Pierre, Suretta, Jacques, Chris, Ravi, Carlos and the boat captain; Tuhen for always making sure I get on and off the boat safely. You guys are all awesome!

My next goal is to become a Jr Dive Master when I'm 15 years old (in three years time (so excited!)). I'm so proud of myself for reaching the Jr MSD qualification, and I feel amazing and grateful for achieving my ambitious dream and for all the wonderful people in my life who also love scuba diving, and the underwater world.

I love diving with the BEST dive buddy in the world (my Dad) and I'm excited to continue my scuba diving around the world starting with the Red Sea in Saudi Arabia in 2022. I hope that many more children would like to learn to scuba dive and enjoy being underwater with all of the marine life.

ETHAN'S DAD

Being a qualified scuba diver for the past twenty years, I know that there is no better feeling in the world than scuba diving and being underwater, gliding through the ocean and watching marine life. My Dad introduced me to scuba diving at a young age, and this allowed me the experience to scuba dive in many places around the world. When I became a father to Ethan, I patiently waited for the day he would be old enough to safely come with me underwater and experience this magical world together. Part of me was hoping that he would enjoy scuba diving with me, and not only am I very happy that he is enjoying the underwater world, but I am extremely proud how he has pushed and challenged himself to learn more, and set himself his own goals on the levels he wants to achieve for himself in scuba diving. Ethan had a choice for his 12th birthday on where he wanted to spend the day, and he chose to go to Sandy Beach Dive Centre to start his Advanced course with it being the first day he could do this – that proved to myself and his Mum how serious he really was about his goals. It's no surprise to me that he has achieved the Junior Master Scuba Diver status because I have seen his focus and dedication, spending hours studying and revising for exams, as well as the hours on the boat and in the water mastering his knowledge and skills.

Being a Dad is the greatest privilege a man can have, and for me being able to have Ethan dive with me as Dive Buddies for the past two years is a dream that has come true! In 2022 I look forward to more diving in the UAE, as well as bringing Ethan to Saudi Arabia to dive with me in the Red Sea with Umluj Dive Centre and my friends from The Red Sea Development Company, who are doing some amazing work protecting, preserving and enhancing the Red Sea Coral and Marine life.

I hope that Ethan's achievements and passion inspires other young children to take an interest in scuba diving and the underwater world with their parents.

CARL WAMSLEY (Ethan's Dad and Dive Buddy)

ETHAN'S INSTRUCTOR

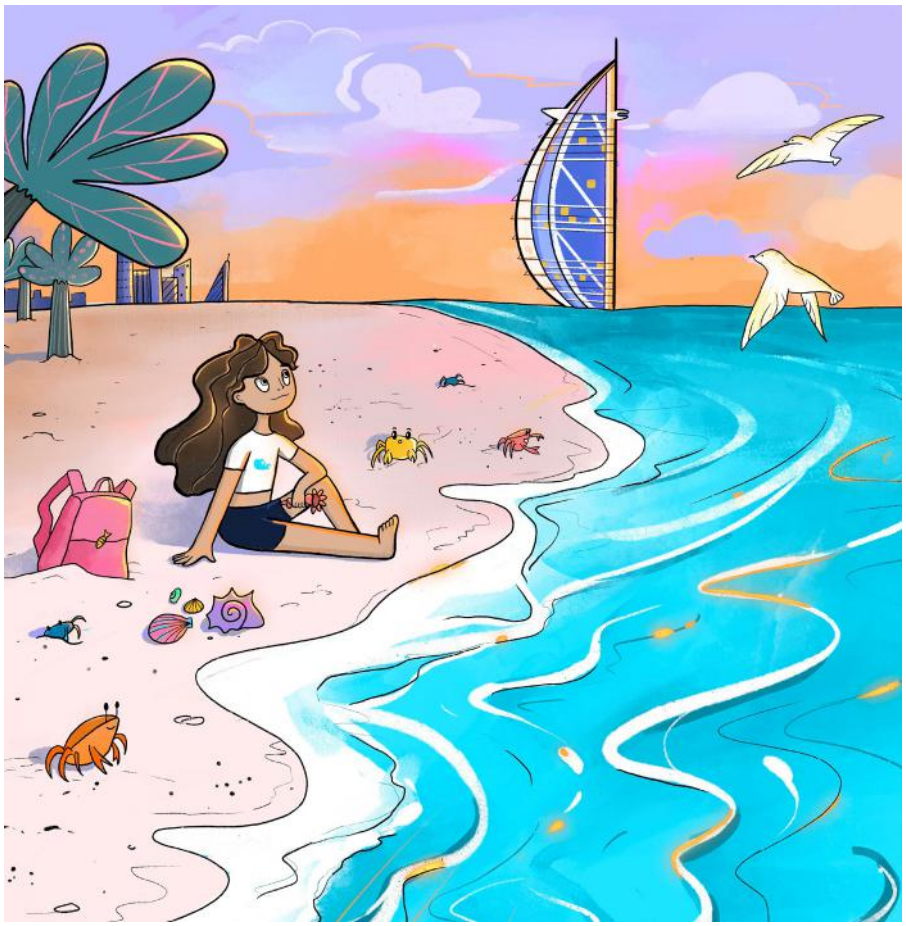
Ethan has been coming to Sandy Beach Dive Centre since the beginning of July 2020. He completed his Discover Scuba Diving experience with us and instantly fell in love with the ocean and all things diving. Soon after, he has come back with his father, Carl and started his Junior Open Water diver license. His positive and always happy approach towards diving made him an instant favourite within the staff, and it is safe to say that more than a year later we consider him as our little brother. Thirst and knowledge for the underwater world has driven Ethan to do multiple specialities soon after. We have completed Peak Performance Buoyancy, Underwater Photography, Underwater Naturalist and O2 Provider specialities before he reached 12 years old. Once he was old enough, he could not wait to do his Junior Advanced Open Water course in which he did exceptionally well. When he expressed the interest of doing his Junior Rescue course a month later, our staff was more than confident that he would be able to perform the hardest course to date. After the two full days of hard training, he again outperformed himself and did exceptionally well. We also have so much fun on the EFR course and on the NITROX speciality course. Since he'd reached 50 dives and had all the certifications needed, we applied for his Jr Master Scuba Diver license. As an instructor who did most of his courses with him, I feel very proud of his accomplishments and most of all, I am happy that Ethan has become a very responsible and environmentally aware diver. I have no doubt that this is only the beginning of his young diving career, and that I have got a dive buddy and friend for life!

MILAN SMOLE
Manager & Owner | Sandy Beach Dive Centre

THE PINK MASK

STORY BY SLAVA NOOR ILLUSTRATIONS BY MADINA KAZANTAYEVA

THE MYSTERIOUS FIND



Once upon a time, there lived a little girl with the beautiful name of Ula. Actually, she was not so little. In August she turned eight. Ula really loved the sea. She fell in love with it as soon as she moved to this big, beautiful and hot city from her own home country. As soon as she went out onto the balcony of her new bedroom, she froze, mesmerised by the sea of shining water.

When Ula first came to the beach with her Mum and Dad, she immediately began to swim as if she had done it all her life. Ula went to the sea almost every day after joining her new school. The beach was not far from their home but away from the noisy cafes, so there were few people there and lots of colourful seashells.

Ula swam, collected seashells and listened to the sounds of the waves. She felt relaxed and at home, and enjoyed the company of loud seagulls and shy crabs. She liked walking barefoot on the edge of the surf, leaving footprints in the sand that were immediately erased by the water. With friends of course, it would have been more fun, but Ula's old friends were a thousand miles away and she still hadn't made new ones. So she sat on the soft yellow sand, and swam in the turquoise water and dreamt of new friendships and real adventures.

On one particular day, Ula came to the beach and took her water bottle and a sandwich out of her backpack. She shared the food with the crabs and the seagulls and wandered into the shallow water along the shore. Ula was sad, and she didn't really know why. She was walking with her head down, and suddenly... it was as if a sunbeam had hit her right in her face. Ula quickly shut her eyes, and when she opened them, she saw an unusual object in the sand. It was strange... It seemed to be calling her and pulling her to it.

Ula sat down and started digging through the sand. The new find seemed to be entangled with algae and covered with little clams, it must have been in the sea for a long time. The more Ula cleaned and scrubbed it, the more it looked like... it looked like... like a mask! It was pink and even seemed to glow a little. Ula had only swam with swimming goggles before. She wondered if the mask was very different from them.

Ula put the mask on, walked in a bit deeper and put her face into the water. The world got more vibrant – colourful fish swirled at her feet and her ears were instantly filled with a myriad of voices.

"O my goodness, it's so hot, this unbearable heat again...

"Yes, yes, I can't stand it, I must move up north ..."

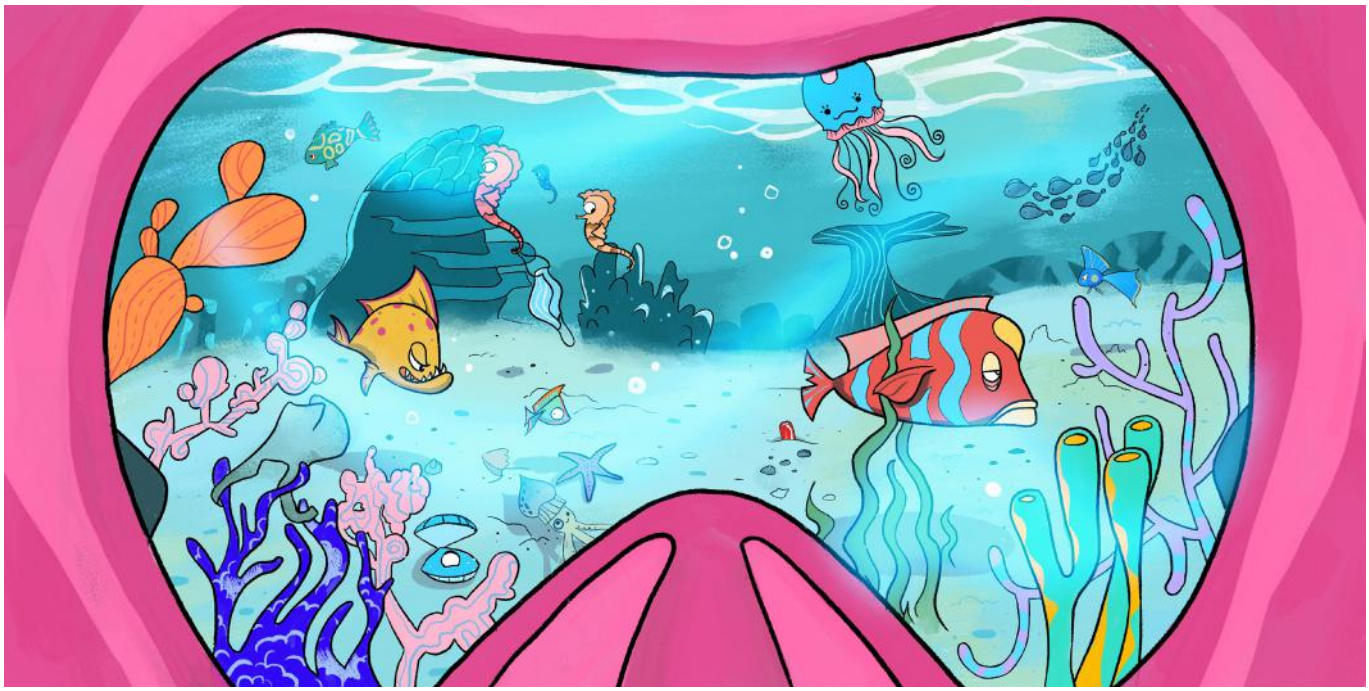
"When is this heat going to end, the water feels like boiling soup..."

"I bet soup feels cooler..."
Ula stood up abruptly, taking off her mask. Who was talking? There was no one beside her. Only the sea murmured. She put the mask back on and carefully lowered

her face into the water again. Once more the magical vibrant world reappeared in front of her, and again someone complained about the heat, though there was no one around except for the colourful fish. But fish can't talk! And definitely not in human language. Or can they?

Ula took off her mask, lowered herself into the water, and nothing happened. The bright colours were gone, so were the voices. "That's what it is! The mask is magic. Finally, a real adventure!" Ula put the mask back on and swam away from the shore, further and deeper.

UNDERWATER CHATTER



Hundreds of sounds of chatter surrounded her. Ula always thought of the ocean as a silent world, but this felt as if she were on a crowded, noisy street.

"...that year the whale shark got lost and almost jumped out onto the shore, and the human police had trouble driving it away."

"Oh yes, I remember that. The shark's name is Brunhilde. She told me later that she wanted to buy some presents for her children in the shop on the waterfront, but to tell you a secret, her radar was just off..."

"...the poor stingrays were scared off by tourists again."

"Stingrays can be frightened so easily, unlike the sea urchins."

"The dugong is just a name. But a cow is a cow even in the sea..."

"Keep off the reefs! I told you to stay close to me. Don't go anywhere near the reef, not even with a fin or a tail!

Ula saw groups of corals, but not like the ones from the Little Mermaid cartoon, but similar to large brown rocks, riddled with many mazes. Sea urchins spread their black needles among the coral. Ula knew that if she stepped on a sea urchin, the needles would pierce her foot and it would hurt for a long time. It was better to stay away from them altogether.

Wow! Did you know, there was also seagrass underwater, so green and so thick? And loads of little fish glide through it, just like butterflies over a lawn.

Then suddenly, from the darkness of the coral reef, two ugly snakelike creatures appeared close to Ula. Ula froze. The two scary faces neared her pink mask. In fact they had fish faces.

"Who are you?" one of the fish heads whispered.

"Why are you wearing a mask?" the other one shouted.

"I am Ula. This is my mask now," replied Ula. "Who are you?"

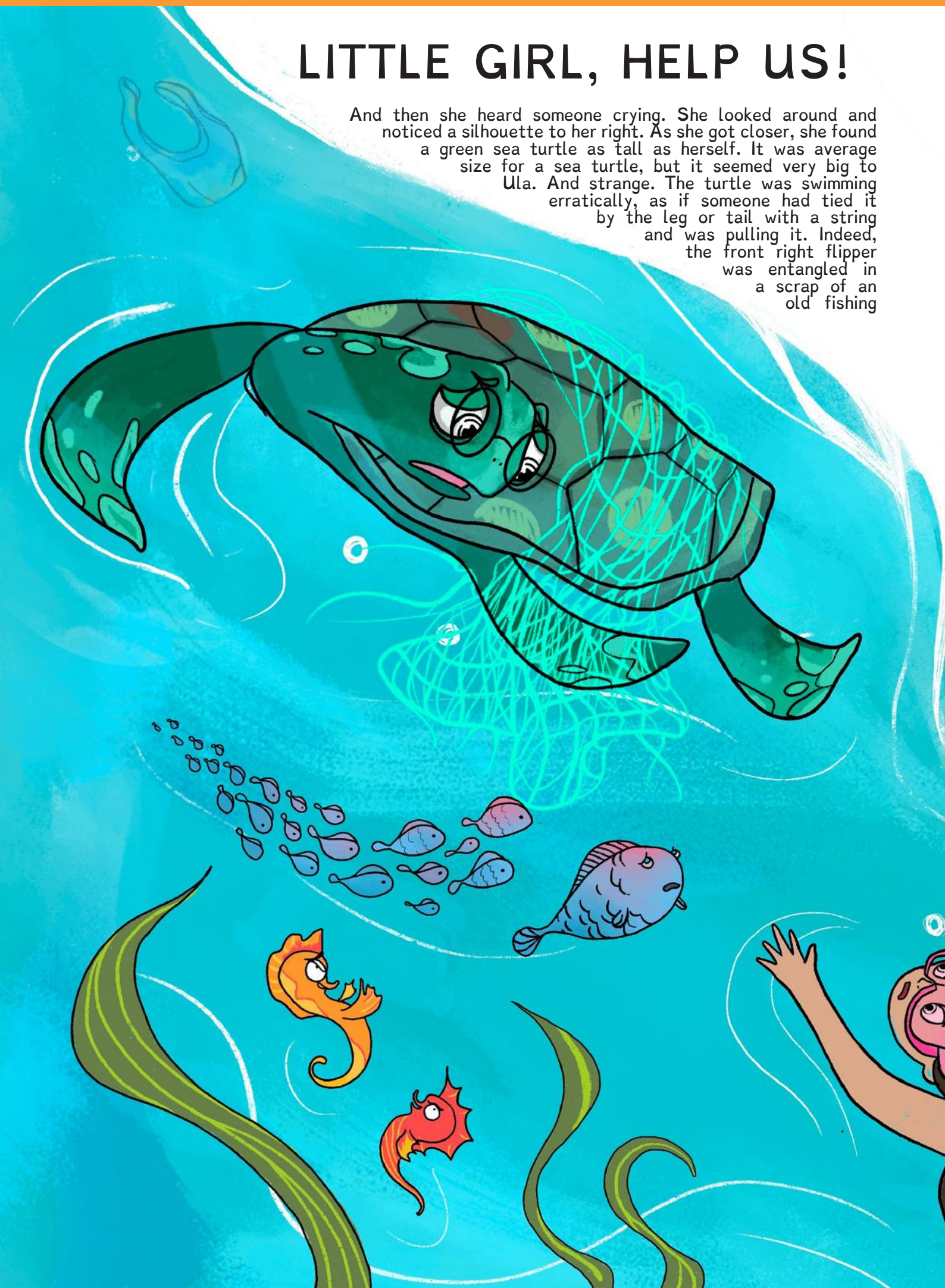
"We are the guardian moray eels. We are on duty to make sure no one gets near the castle."

"What castle?" Ula asked, but the moray eels had already disappeared.

Ula realised that she had been underwater for a long time, breathing easily and even talking. It was all thanks to the mask! But how was she underwater? What if her Mum and Dad were already home and thought they had lost her? Ula turned back towards the shore.

LITTLE GIRL, HELP US!

And then she heard someone crying. She looked around and noticed a silhouette to her right. As she got closer, she found a green sea turtle as tall as herself. It was average size for a sea turtle, but it seemed very big to Ula. And strange. The turtle was swimming erratically, as if someone had tied it by the leg or tail with a string and was pulling it. Indeed, the front right flipper was entangled in a scrap of an old fishing



net, and the poor turtle was limping in the water.

Instinctively Ula wanted to help the turtle without any hesitation. She hoped the turtle would not be scared of her like that funny street cat that had ran away from her when she wanted to feed it.

"Little girl, help me! Hurry up!" The turtle was already holding out its flipper to Ula.

"Yes, of course, but try not to move," Ula said, and began to work.

She gently untangled the net, trying not to twist the threads as to not hurt the turtle's flipper. It was not a quick job. The turtle waited patiently, but she kept chatting on, and on. Ula learned that her name was Rita and she was a young fifty four years old. She had very few relatives left as they all kept disappearing, and it was becoming scarier and scarier because the terrible Trash Monster appeared in the sea. It's him who spread fish nets all over the sea. He also scattered cages on the sea bottom to trap the fish and other sea animals. He has caught so many sea inhabitants in them and locked them up in the trash prison. Those who see the Trash Monster, get silenced forever. But they say he is enormous, has teeth bigger than a shark's, has a thousand claws, a dozen poisonous tentacles, and could paralyse anything with just the touch

of its creepy tail.

"What can we do? How can we live like this?" cried Rita.

"The monster wants to take over the entire Ocean. He is a terrible and merciless invader. Everyone is afraid of him, even the big sharks and blue whales. And guess what? They say you can't stop the Trash Monster," Rita explained.

Ula untangled the last knot and freed Rita's flipper. The turtle rushed to hug the girl.

"Thank you. You saved me," cried Rita. "No one else could have, not the crabs or the dolphins, but you d i d it!" Suddenly Rita became silent, as if she had been switched off. She was silent for a minute. And then she started to plea, "Help us! You're the only one who can defeat the Trash Monster! You're brave, you've got strong hands and you're kind..."

"But I'm just a little girl, how can I help you? How can I win a battle with the gigantic, invincible Trash Monster? I'm sorry, I can't." she murmured, and swam as hard as she could back to the shore with Rita's cry for help still ringing in her ears.

Ula got to the safety of the beach, tore off her mask, tossed it into her backpack, put on her clothes and raced home.

REEF CHECK MALAYSIA TALKS REEF RESILIENCE PARTS 2 & 3

BY **REEF CHECK MALAYSIA**

Reef Check Malaysia is currently operating long-term marine resource conservation programmes in three locations: Tioman island, Mantanani island and the Johor islands. We also have on-going programmes – such as our annual coral reef monitoring survey programme – that take us to other islands in both Peninsular and East Malaysia. As we work increasingly closely with local stakeholders (islanders, tourism operators, etc.) and develop a deeper understanding of some of the challenges facing communities and managers alike, several inter-linked themes are starting to emerge that need more attention: resilience, livelihoods and co-management.

In Part 1 of this article series found in the September magazine issue, we suggested that one approach to conserving reefs is to support resilience. What we didn't address was what the impact of doing so has on communities and livelihoods.

Resilience broadly describes the capacity of an ecosystem to recover from degradation, thus maintaining ecosystem services. Supporting resilience contributes to long term conservation of reefs. But how do we support resilience?

One way is to reduce our impacts on nature, to achieve several goals:

- Prevent physical damage caused by marine tourism;
- Reduce sewage pollution from resorts and other sources;
- Manage fishing activities to protect key species;
- Control the release of siltation from construction sites.

These are just a few examples. But one common denominator in all of them is: how does this affect the livelihoods of communities associated with reefs?

Coastal communities earn their living from the sea. They are either fishermen or they work in the tourism industry – both of which rely on healthy ecosystems.

But maintaining healthy ecosystems by implementing projects to achieve the above goals can have negative consequences for jobs:

- Controlling marine tourism might lead to a reduction in numbers of tourists, which reduces jobs in guiding;
- Insisting on strict adherence to sewage regulations might reduce investment in resorts, which might mean less job opportunities for coastal communities;
- Restricting fishing to certain areas can increase costs to fishermen who have to travel further – or can even lead to job losses due to loss of fishing grounds;
- Improving the management of construction sites in coastal areas could lead to reduced investment in resorts, again meaning less jobs for communities.

On the other hand, there could just as easily be positive outcomes for jobs – healthier ecosystems mean a better tourism product; beaches and seas clean of sewage pollution makes for a popular tourism destination; and managing fishing can eventually lead to recovery of fishing stocks. So long-term reef conservation means much more than just managing biological factors.

If we want healthy oceans, we also have to look after the interests of the local communities who depend on the ocean. It is essential to manage the related economic factors – jobs and food security – if we want the support of the communities that will be affected by the proposed conservation measures. Because if they don't – then those measures are more likely to fail.

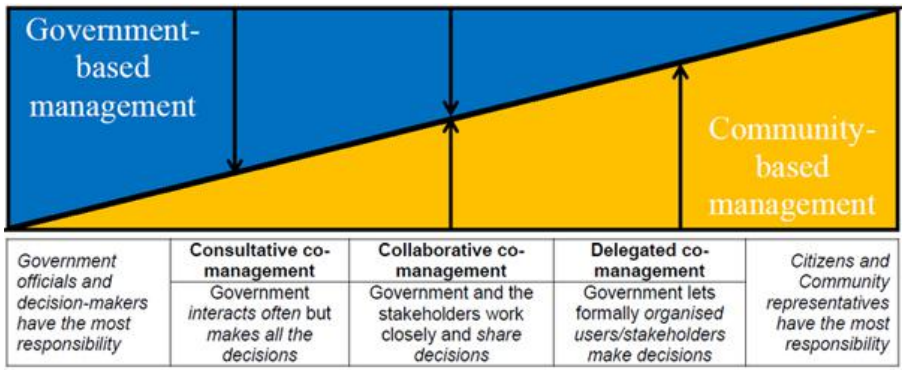
Think, for example, of the resources needed to effectively patrol an island with a coastline of 169km – and a marine protected area stretching 2 nautical miles from the coast. If the island community supports the marine protected area, then they will comply with the fishing restrictions, reducing the patrolling and enforcement needs. But if they don't support the protected area – perhaps because they were not consulted when it was imposed – then compliance with regulations will be low and the need for patrolling and enforcement increases dramatically.

Another area in which we often see conflict is tourism. Tourism can bring economic benefits, but at the same time, growing visitor numbers can put stress on both local communities and ecosystems. If the benefits of tourism are not shared with the local communities affected – as is often the case – then why should local communities comply with regulations that focus on growing tourism? On the other hand, if we ensure that local communities do benefit from tourism – specifically by actively involving them in community-based tourism initiatives – then once again, compliance with regulations increases and the cost of management goes down.

At Reef Check Malaysia, we've been working closely with communities on several islands, and we've seen first-hand how communities rely on the ocean for their livelihoods. Over-reliance on fishing – or tourism – can eventually have negative consequences for livelihoods. We are working with communities to diversify livelihoods, with skills training and investments in community-based tourism.

Empowering local communities is important. There is no simple fix or methodology to improving management of marine resources. We are just part of the puzzle, and at the end of the day, a whole raft of stakeholders – government agencies, communities, tourism operators, etc. – should be part of the conversation. We will continue to raise awareness on how important it is that local communities are involved in management, to ensure their voices are heard and their interests protected.

When we talk about co-management, we are really talking about the range of management options, from 100% run by the government through to 100% run by local stakeholders, as shown in the diagram below:



Malaysia's approach to managing its Marine Parks is anchored to the left, sometimes described as a "top-down" approach, which means that all decisions on management, regulations, etc., are taken by the relevant government management agency – in this case the Marine Parks section of the Department of Fisheries. There is little opportunity for stakeholders – particularly those living on the marine park islands – to have any say in these decisions, and this can create disagreement, tension and even conflict between management agencies and "the managed".

WHAT IS CO-MANAGEMENT?

Co-management, also known as participatory management or locally-based management, provides a middle ground between a top-down and community-based (or "bottom-up") management approach.

The concept of co-management developed as a result of the failure of the top-down approach due to:

- The difficulty of enforcing restrictions imposed by management agencies;
- Lack of compliance from local stakeholders.

There are numerous reasons why there is a need to shift to a participatory approach:

1. Trend towards empowering communities and civil society – enshrined in the Malaysian National Policy on Biological Diversity and the Sustainable Development Goals;
2. Increasing conflicts among stakeholders are not being managed;
3. Unmanaged resource exploitation;
4. Increasing degradation of coastal and marine habitats by marine and land-based pollution;
5. Local attitude of "not my problem" and "it is the government's responsibility" creates a negative, non-caring attitude among local stakeholders;
6. Low income and job security of some stakeholders;
7. Lack of interaction between management agencies and local stakeholders;
8. Weak linkage between healthy ecosystems and visitors and businesses;
9. Marine park territorial disputes cause lack of interest in managing resources;
10. Lack of legitimacy, pride and transparency in management and decision-making;
11. State government's increasing interest in taking over the responsibility to manage their own resources.

Co-Management Involves Conscious and Official Sharing of Responsibility and Formal Vesting of Authority to Local Stakeholders for the Management of Resources:

Stakeholders are people and/or groups whose interests, resources, power or authority are likely to substantially impact, or be impacted by, management or lack of management. In other words, anyone that has interest in a certain marine resource, regardless of their location, can be considered a stakeholder. Therefore, co-management can be defined as: "A partnership arrangement in which the community of local resource users, government, other stakeholders and external agents share the responsibility and authority for decision making over the management of natural resources."

Co-management is common in natural resource governance, especially in Southeast Asia and the Pacific Island regions. Local communities and relevant government authorities work on a partnership basis. The main goals are to:

1. Conserve biodiversity and natural resources;
2. Ensure the community's socioeconomic needs are not side-lined.

This approach has generated success for conservation strategies in marine protected areas because:

- More participation in decision making raises the knowledge base among stakeholders;
- It allows better representation of the stakeholders' interests;
- It provides for the involvement of NGOs/civil society, who can help local communities understand their rights and their role in management.

When all stakeholders have a long-term commitment to and involvement in conservation management, there will be more support for the purpose and more compliance with regulations. Success requires that they should be involved actively, and also have reasonably equal voices in the management body. There also has to be balance between ecological values and socio-economic values when protecting an area. Early involvement from stakeholders in planning and management of marine protected areas has been shown to significantly reduce the likelihood of creating 'paper parks' or ineffective management.

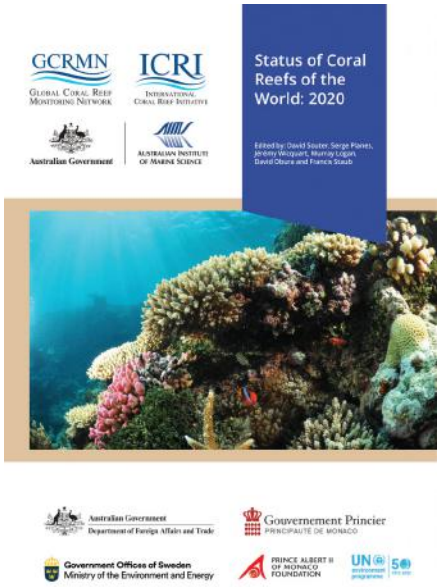
In Tioman, a participatory approach to management is emerging, under the Department of Fisheries "Reef Care" programme. Launched nearly two years ago, Reef Care vests some responsibility for marine resource management to the local community, in this case in Tekek and Air Batang villages. Together with another community initiative we have established, the Tioman Marine Conservation Group (TMCG), local villagers are able to participate in conservation programmes and have an impact on the way a small area is managed. For some, it is even proving an additional source of income – especially important given the impact of the COVID-19 pandemic on tourism on the island.

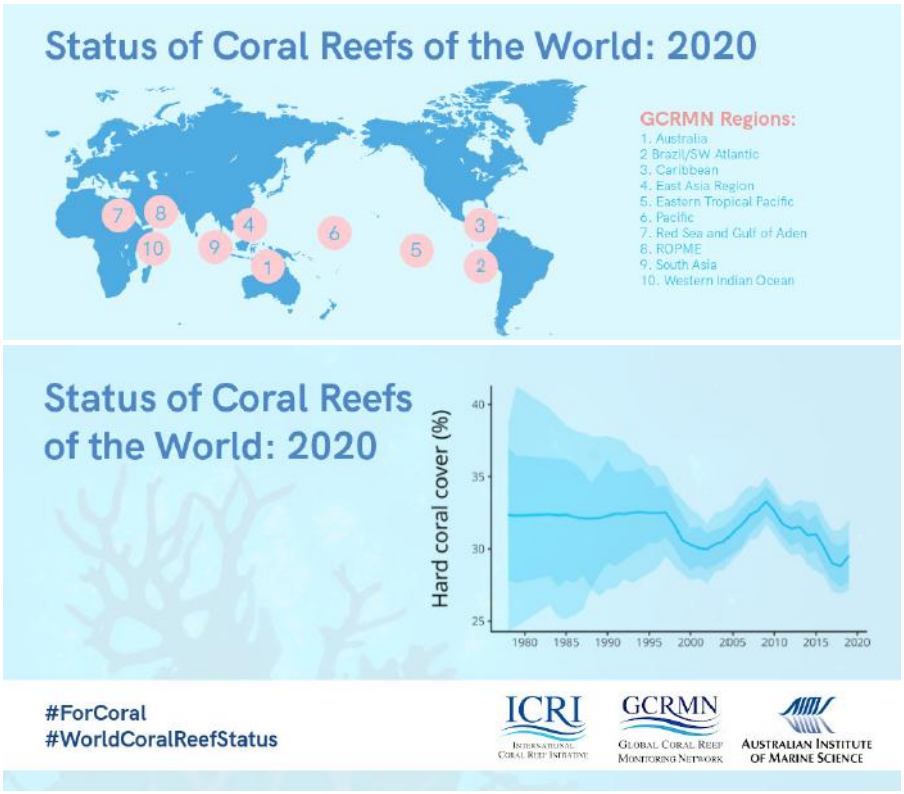
The system isn't perfect by a long way – there is no funding for programmes, and villagers have limited scope for changing regulations. But it's a step in the right direction and we are hopeful that the Department of Fisheries will extend it.

But there is another piece of the puzzle that is emerging as important, and which we have to consider: governance. The IUCN manual on Governance of Protected Areas describes governance in the following way: "Wherever decisions are being made and power and authority are exercised, some form of 'governance' is in place."

This puts understanding governance at the heart of effective conservation. The power and the capacity to make decisions have a major influence on the achievement of protected area objectives, the sharing of responsibilities, rights, costs and benefits, and the generation and maintenance of support – be it financial, political, or from the communities in and around the protected areas in question.

REEF CHECK CONTRIBUTES TO NEWLY RELEASED STATUS OF CORAL REEFS OF THE WORLD REPORT





This month saw the release of the Status of Coral Reefs of the World Report: 2020, of which Reef Check and its tropical coral reef database was a contributor.

This report is the flagship product of the Global Coral Reef Monitoring Network (GCRMN) and describes the status and trends of coral reefs worldwide. This sixth edition of the report is the first since 2008, and the first based on the quantitative analysis of a global dataset compiled from monitoring data contributed by more than 300 members of the network. The global dataset spanned more than 40 years from 1978 to 2019, and consisted of almost 2 million observations from more than 12,000 sites in 73 coral reef countries around the world.

The report documents the loss of approximately 14 percent of the world's coral since 2009, but also found that many of the world's coral reefs remain resilient and can recover if conditions allow, providing hope for the long-term health of coral reefs if immediate steps are taken to reduce emissions to curb future warming.

The analysis which examined 10 coral reef regions around the world showed that coral bleaching events caused by elevated sea surface temperatures (SSTs) were the main driver of coral loss, including an acute event in 1998 that is estimated to have killed eight percent of the world's corals, which, to put this in context, is more than all the coral that is currently living on reefs in the Caribbean. While coral cover recovered to pre-1998 levels by 2009, the long-term decline seen during the last decade coincided with persistent elevated SSTs.

The analysis investigates changes in the cover of both live hard coral and algae. Live hard coral cover is a scientifically based indicator of coral reef health, while increases in algae are a widely accepted signal of stress to reefs. Between 2010 and 2019, the amount of algae increased by 20 percent, corresponding with declines in hard coral cover. This progressive transition from coral to algae-dominated reef communities reduces the complex habitat that is essential to support high levels of biodiversity.

The report also highlights that although the interval between mass coral bleaching events over the last decade has been insufficient to allow coral reefs to fully recover, some recovery was observed in 2019 with coral reefs regaining 2% of coral cover. This indicates that coral reefs are still resilient and if pressures on these critical ecosystems ease, then they have the capacity to recover, potentially within a decade, to the healthy, flourishing reefs that were prevalent pre-1998.

KEY FINDINGS:

- Large scale coral bleaching events are the greatest disturbance to the world's coral reefs. The 1998 event alone killed eight percent of the world's coral, which is the equivalent of about 6,500 square kilometres of coral. The greatest impacts of this mass bleaching event were seen in the Indian Ocean, Japan, and the Caribbean, with smaller impacts observed in the Red Sea, The Gulf, the northern Pacific in Hawaii and the Caroline Islands, and the southern Pacific in Samoa and New Caledonia.
- Between 2009 and 2018, the world lost about 14 percent of the coral on its coral reefs, which equates to around 11,700 square kilometres of coral, more than all the living coral in Australia.
- Reef algae, which grows during periods of stress, has increased by 20 percent over the past decade.
- Coral reefs in East Asia's Coral Triangle, which is the centre of coral reef biodiversity and accounts for more than 30 percent of the world's reefs, have been less impacted by rising sea surface temperatures. Despite some declines in hard coral during the last decade, on average, these reefs have more coral today than in 1983 when the first data from this region were collected.
- Almost invariably, sharp declines in coral cover corresponded with rapid increases in sea surface temperatures, indicating their vulnerability to temperature spikes, which is a phenomenon that is likely to happen more frequently as the planet continues to warm.

The Executive Summary, Global Analysis and Regional Chapters are all available to download at:
https://gcrmn.net/2020-report/

REEF CHECK BECOMES AN AAUS ORGANISATIONAL MEMBER

Reef Check is ecstatic to announce that we are now an organisational member of AAUS (American Academy of Underwater Sciences)! AAUS is a non-profit, self-regulating body dedicated to the establishment and maintenance of standards of practice for scientific diving with a mission of advancing and facilitating safe and productive scientific diving. The AAUS was officially chartered in California in 1983 by individuals and organisations involved in the effort to obtain the scientific diving exemption from OSHA commercial diving standards. We are joining colleges and universities, government agencies, museums and aquaria, environmental and archaeological consulting firms and other community scientific groups in abiding by the same safe diving practices while using scientific diving as a research tool.

AAUS produces consensual standards for the training and certification of scientific divers and the operation of scientific diving programmes, maintains statistics detailing scientific diving activities and incident rates, conducts annual symposia and topical workshops, and directly supports student research. Becoming an AAUS member makes it easier for scientific divers from other institutions to dive on Reef Check projects and for Reef Check divers to potentially help with research outside of Reef Check. We are excited for the collaboration that this will foster between Reef Check and the larger scientific diving community.

All divers who go through Reef Check kelp forest monitoring training are now acknowledged as Citizen Science Divers by an AAUS Organisational Member! Reef Check staff and volunteers who have completed 50+ Reef Check dives and elect to go through additional training can be certified as full AAUS Scientific Divers through Reef Check. Courses are tentatively scheduled for next spring. Contact Dan Abbott, the Reef Check Diving Safety Officer, for more information at dabbott@reefcheck.org.

Lastly, we encourage all of our divers to join the AAUS community by becoming Individual Members of AAUS! Go to **www.aaus.org** for more information.

AN OPEN LETTER TO WORLD LEADERS: REEF CHECK JOINS BLUE CARBON EFFORT

Our ocean gives us every second breath. It is the blue beating heart of our planet, but we are putting it under pressure like never before. Mangroves being wiped out, coral reefs bleaching and dying, and whale populations on the brink of extinction are bad news for our planet, our climate and every one of us.

This year, national governments have the chance to protect our ocean at the key climate talks in Glasgow. Join Reef Check, other NGOs, celebrities and scientific experts to send a clear message to world leaders: protect blue carbon!

Your voice makes a difference! Sign the letter here to tell world leaders to stand up for the oceans: https://act.ejfoundation.org/bluecarbon

COMMUNITY COMES TOGETHER TO ASSESS ORANGE COUNTY OIL SPILL IMPACT

Earlier this month, an estimated 25,000 gallons of crude oil from a ruptured pipeline impacted the coastal waters of Orange County, California. We let you know that we shared your concern about the oil spill and that we needed your support to ensure that we would be able to conduct the required assessments and garner the necessary information to help local reefs recover from any negative impacts this spill could have on the region's important kelp forest communities.

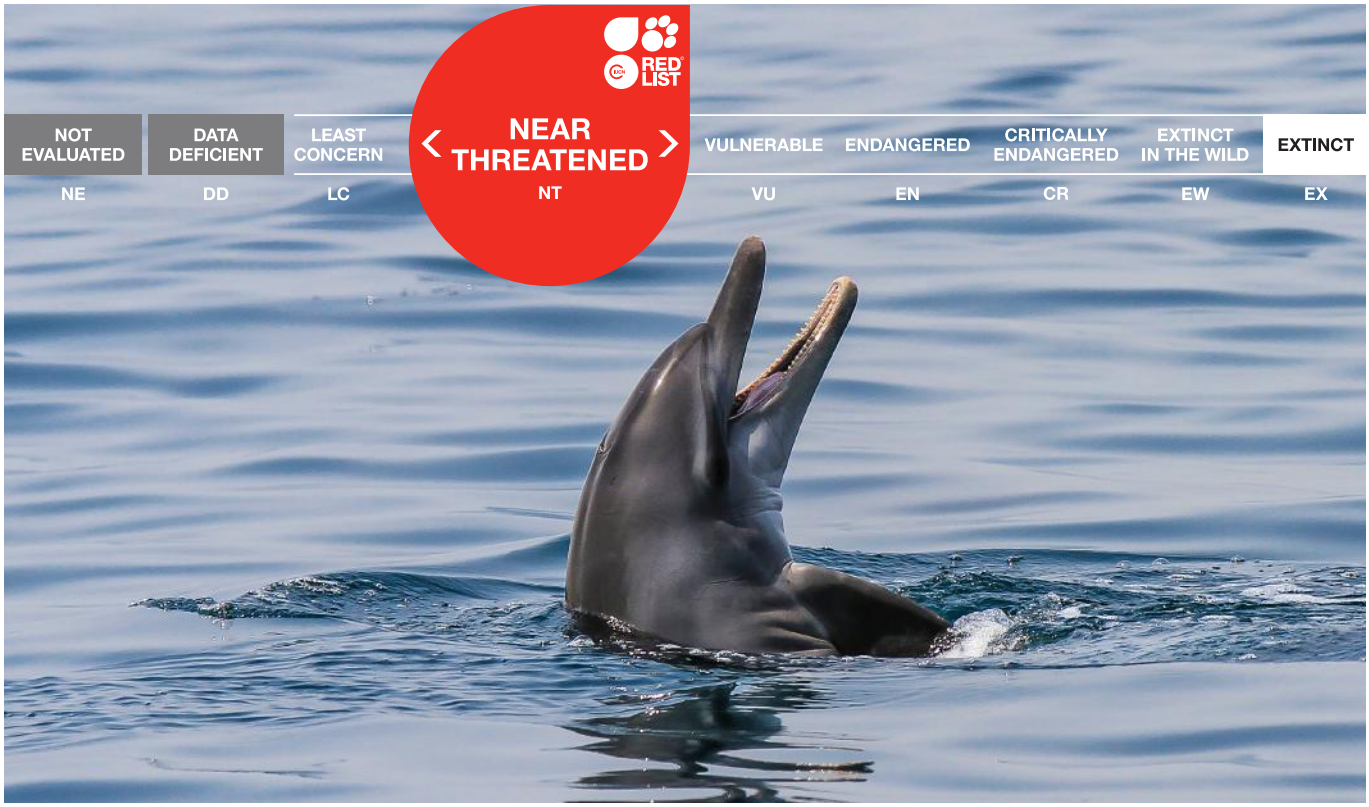
Thanks to your support, we have mobilised our highly skilled volunteer team to conduct surveys at six kelp forest sites. Luckily, it looks like this spill might not have been as bad as initially feared. After our divers have had the chance to re-survey our Orange County sites, we will update you with what we learn about the post-spill effects on these fragile ecosystems.

With endless gratitude, we thank each of you – our divers and supporters – for making this possible. It's a testament to the strength of the Reef Check community to be able to organise and respond to these emergencies so quickly.

FEATURE CREATURE

INDO-PACIFIC BOTTLENOSE DOLPHIN (*TURSIOPS ADUNCUS*)

FEATURE **IUCN RED LIST 2019** PHOTOGRAPHY **ADA NATOLI – UAE DOLPHIN PROJECT**



RED LIST CATEGORY & CRITERIA: NEAR THREATENED

Scientific Name: *Tursiops aduncus*

Synonym(s): *Delphinus aduncus* (Ehrenberg, 1833)

Common Names: Indo-Pacific Bottlenose Dolphin, Indian Ocean Bottlenose Dolphin

TAXONOMIC

The Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*) has been recognised as a different species from the more widely distributed Common Bottlenose Dolphin (*Tursiops truncatus*) since the late 1990's (Rice, 1998). Indo-Pacific Bottlenose Dolphins are distinct from Common Bottlenose Dolphins based on concordance among genetic, osteology, colouration and external morphology data (Wang et al. 1999, 2000a,b). No Indo-Pacific Bottlenose Dolphin subspecies are currently recognised by the Society for Marine Mammalogy's Committee on Taxonomy (2018). However, a recent re-assessment of Tursiops taxonomy worldwide (IWC 2019) and extensive genetic studies (Moura et al. 2013, Amaral et al. 2016, Gray et al. 2018) identified 4 or 5 different lineages (Africa, Pakistan, Bay of Bengal, China and Australia), including the recently described "*T. australis*" (Charlton-Robb et al., 2011) that may eventually be recognised as a subspecies. There is considerable population structure throughout the range of the species and multiple studies of morphology (Hale et al., 2000, Kemper 2004, Charlton-Robb et al., 2011) and genetics (Natoli et al. 2004, Särnblad et al. 2011, Charlton-Robb et al. 2011, Amaral et al. 2016) indicate that the taxonomic status for a number of populations in different regions should be re-evaluated.

JUSTIFICATION

Indo-Pacific Bottlenose Dolphins generally occur in shallow coastal waters of the Indian Ocean, Southeast Asia and Australia. They are among the more commonly studied cetaceans in the Indian Ocean, especially in Shark Bay, Western Australia. However, information on distribution, population size, and trends in abundance and mortality from much of the species' range is still very limited. As they are primarily coastal, Indo-Pacific Bottlenose Dolphins often co-occur with fisheries, and bycatch is a major cause of concern for this species. Indo-Pacific Bottlenose Dolphins are also at risk from high levels of noise and chemical pollution, industrial activity such as oil and gas development, and habitat reduction caused by land reclamation and coastal development (Curry and Smith 1997, Wells and Scott 1999, Reeves et al. 2003, Kiszka et al. 2008). Furthermore, survey data suggest that Indo-Pacific Bottlenose Dolphins occur in relatively small populations or communities with limited geographic ranges, especially where they reside close to islands (Krützen et al. 2004, Natoli et al. 2008, Fury et al. 2008, Särnblad et al. 2011, Kiszka et al. 2012, Gray et al. 2018), which can exacerbate the impact of human activities and demographic stochasticity on this species.

Estimates of abundance from populations for which information on bycatch is also available indicate that human-caused mortality is frequently unsustainable (Cockcroft et al. 1992, Shirakihara and Shirakihara 2012, Preen 2004). Based on the sum of existing abundance estimates, the total population size for the species over its entire range is likely well in excess of 40,000 individuals. Large parts of the range have never been surveyed (e.g. much of the Arabian Sea, Arabian/Persian Gulf, Pakistan, India, Red Sea, Somalia, Yemen, Mozambique, Indonesia, Philippines).

The Indo-Pacific Bottlenose Dolphin was classified as Data Deficient in 2008. The species distribution overlaps the range of several other coastal cetacean species that are red-listed as Endangered (Irrawaddy Dolphin *Orcaella brevirostris* and Indian Ocean

Humpback Dolphin *Sousa plumbea*) or Vulnerable (Indo-Pacific Humpback Dolphin *Sousa chinensis* and Australian Humpback Dolphin *Sousa sahulensis*, Australian Snubfin Dolphin *Orcaella heinsohni* and the Indo-Pacific Finless Porpoise *Neophocaena phocaenoides*) and are subject to the same anthropogenic threats. However, compared to these other species, the Indo-Pacific Bottlenose Dolphin is assumed to be under less immediate threat because it has a wider geographic range and probably larger numbers, greater behavioural plasticity and broader habitat preferences. Data is insufficient to present a robust case for listing the Indo-Pacific Bottlenose Dolphin in a threatened category (CR, EN, or VU). However, its coastal distribution, inferred local declines, and intensity of threats throughout its range lead to the conclusion that Least Concern is not an appropriate category.

The Red List Guidelines (version 11, 2014) state that "the category Near Threatened is applied to taxa that do not qualify as threatened now, but may be close to qualifying as threatened, and to taxa that do not currently meet the criteria for a threatened category, but are likely to do so if ongoing conservation actions abate or cease." Also, to qualify for Near Threatened, the taxon "should be close to qualifying for the Vulnerable category; estimates of population size or habitat should be close to the Vulnerable thresholds, especially when there is a high degree of uncertainty, or possibly meet some of the subcriteria; and this may be combined with biological susceptibility and threat." Considering the above, the Indo-Pacific Bottlenose Dolphin is listed as Near Threatened because: 1) it occurs in a relatively small and restricted near-shore range, 2) it is highly vulnerable to entanglement in fishing gear and its range overlaps with intensive fisheries known to entangle and kill dolphins, 3) its near-shore habitat is subject to increasing anthropogenic threats resulting in habitat loss and degradation, and 4) it is experiencing mortality rates that are likely to be causing population declines in several areas. The species therefore comes close to meeting criterion A4 for Vulnerable. Population size is inferred and suspected to have declined by close to 30% throughout the range of the species, over three generations and in a time period encompassing the past, present and future. The causes of the reduction (gillnet entanglement and coastal habitat degradation) have not ceased. Generation length for Indo-Pacific Bottlenose Dolphins, according to Taylor et al. (2007), is 21.1 years, therefore three generations is 63.3 years. Thus, an annual decline of around 0.5% would result in exceeding the 30% decline in 3 generations. Gillnet fisheries and coastal development are increasing throughout the range of the species and bycatch is anticipated to remain stable or to increase in the future without urgent and intensive efforts which are unlikely to be forthcoming.

It is important to emphasize that numerous isolated populations of this species would likely qualify as threatened subpopulations, particularly those found around island groups in the Indian Ocean.

GEOGRAPHIC RANGE

Indo-Pacific Bottlenose Dolphins have a discontinuous distribution in warm-temperate and tropical waters of the Indo-Pacific region. They are found primarily in shallow coastal and estuarine waters and in shallow reef complexes (Jefferson et al. 2015). The species occurs from Australia in the east, throughout southeast Asia (including the Malay Archipelago and Cocos [Keeling] Islands) (Tom Jefferson pers. comm.), China (north to the Korean Peninsula) and southwestern Japan) and around the northern Indian Ocean rim (including in the Red Sea and Arabian/Persian Gulf) to the western range limit in eastern South Africa (Wells and Scott 2002, Möller and Beheregaray 2001, Jefferson et al. 2015). Indo-Pacific Bottlenose Dolphins also occur in the coastal waters of many oceanic islands distant from major land masses including the Maldives (Anderson et al. 2012), the Andamans (Malakar et al. 2015), New Caledonia (Borsa 2006), the Comoros and Mayotte (Kiszka et al. 2010, 2012), the Solomon Islands (Oremus et al. 2015), La Réunion (Dulau-Drouot et al. 2008), Mauritius (Webster et al. 2014) and the Seychelles (Kiszka 2015).

POPULATION

Indo-Pacific Bottlenose Dolphins are among the best-studied species of small cetaceans in the Indian Ocean and in the western South Pacific (Solomon Islands). Although estimates of abundance (detailed below) are available for many local areas, the majority of their range has yet to be surveyed. Some available estimates are imprecise, lacking in sufficient details to

evaluate their accuracy and context, and/or were generated sufficiently long ago (e.g. 20+ years ago) that, with increases in fishing intensity and coastal development, the present situation could be much different. In most locations studied, population sizes are small, typically in the low hundreds of individuals or fewer (<100). Exceptions include an estimate of between 1,700-2,200 individuals generated from data collected in 2005-2009 in Bangladesh, which represents an unknown portion of a larger super-population of Indo-Pacific Bottlenose Dolphins that extends farther west into un-surveyed waters in India; 2,000-3,000 dolphins documented to occur in Shark Bay, Western Australia; and a large population in the Algoa Bay region, South Africa estimated at about 28,000 individuals from data collected in the late 1990s (see details below).

In Australian waters, estimates of local populations indicate that this species is common mainly in inshore and nearshore waters. However, further genetic work is required to better define the distribution of the species, especially with regard to the taxonomic identity of particular populations to either *T. aduncus* or *T. truncatus*. Abundance estimates from surveys carried out between 2003 and 2006 for the Clarence River and Richmond River estuaries in northern New South Wales, were 71 and 34, respectively (Fury et al. 2008). Abundance estimates in Jervis Bay ranged from 61 ±3.2 in summer 1998/99 to 108 ±7.1 in summer 1997/98, and from 143 ±8.1 in summer 1999/00 to 160 ±8.1 in summer 1998/99 in Port Stephens (Möller et al. 2002). In Moreton Bay, Queensland, a population size of 554-622 was estimated from boat-based surveys in 2008-2010 (Ansmann et al. 2013), with a further 700 to 1,000 individuals believed to occur off Point Lookout in 1998-99 (Chilvers and Corkeron 2003). In southern Australia, where Indo-Pacific Bottlenose Dolphins are those identified as "*T. australis*" (Charlton-Robb, 2011), resident populations of 80-100 animals occur in Port Phillip Bay and 50-150 in the Gippsland Lakes (unpublished data cited in Charlton-Robb et al. 2015). Local population estimates for South Australia indicated that approximately 74 resident Indo-Pacific Bottlenose Dolphins inhabited the Port River estuary and Barker Inlet, Gulf St Vincent (Steiner and Bossley 2008). From 1989 to 2005, between 95 and 239 individuals occurred in Adelaide's coastal waters in winter 2013 and summer 2014, respectively (Zanardo et al. 2016), and 306 occurred in Coffin Bay between September 2013 and October 2015 (Passadore et al. 2017). Abundance estimates of southern Australian bottlenose dolphins, (likely to be the putative species "*T. australis*" based on their coastal distribution and small group size), was estimated using double-observer platform aerial surveys over an area of 42,438 km^2 within two gulfs of South Australia. A total of 3,493 individuals were estimated in summer/autumn, and 3,213 in winter/spring of 2011 (Bilgmann et al. 2019). A population of 63 to 185 Indo-Pacific Bottlenose Dolphins was estimated off Bunbury, Western Australia, during winter 2007 and in summer 2010, respectively (Smith et al. 2013, Sprogis et al., 2016). In coastal and estuarine waters near Perth, Western Australia, total estimated abundances in the Swan Canning Riverpark estuary, Gage Roads, and Cockburn Sound/Owen Anchorage between June 2011 and May 2015 were 16, 172, and 103, respectively (Chabanne et al. 2017). Aerial surveys in 1989 and 1994 indicated that a population of 2,000-3,000 dolphins occurred in Shark Bay, Western Australia, most being Indo-Pacific Bottlenose Dolphins (Preen et al. 1997). In North Western Australia, 157 individuals were estimated to inhabit Beagle Bay and 35 to 60 Cygnet Bay in 2012-2013 (Brown et al. 2016). In Darwin Harbour and two neighbouring sites, Northern Territory, abundance estimates ranged from 20 in October/November 2013 to 38 in October 2012 (Brooks et al. 2017).

Between 1994 and 2001, a total of 169 Indo-Pacific Bottlenose Dolphins were identified off Mikura Island, Japan (Kogi et al. 2004), and 216 individuals were estimated off Amakusa-Shimoshima Island, western Kyushu, Japan, in 2008 (Shirakihara and Shirakihara 2012). Approximately 1,000km south of Tokyo an estimated 200-300 animals occur around the main Ogasawara Islands (Mori 2005). In the Swatch-of-No-Ground (SoNG) submarine canyon, off the coast of Bangladesh, mark-resight abundance estimates generated for 2005-2009 were 1,701, 1,927, 2,150, and 2,239 individuals (Mansur et al. 2012). In the Arabian/Persian Gulf, abundance comparisons from two aerial surveys conducted in 1986 and 1999 in the southern-western area suggested an overall decline of 71% of small

cetaceans over 13 years, where *T. aduncus* is estimated to account for 71% of the overall assemblage of dolphin species (Preen 2004). Surveys of Abu Dhabi waters conducted in 2014-2015 (55 boat-based surveys, 5,592km of on effort transects) yielded an estimate of 1,834 individuals (Díaz López and Methion 2016). Surveys of Dubai waters conducted in 2014 (56 boat-based surveys and 220 hours of effort) resulted in 8 sightings and 92 individuals being identified (A. Natoli, unpublished data).

In East Africa and around some islands of the western Indian Ocean, several abundance estimates are available. Between 1999 and 2002 off southwest Zanzibar, Tanzania the smallest estimate of Indo-Pacific Bottlenose Dolphin abundance was 136 in 2001 and the largest was 179 animals in 2002 (Stensland et al. 2006). In southern Kenya, a population of Indo-Pacific Bottlenose Dolphins was estimated using mark-recapture as ranging from 19 individuals to a maximum of 104 dolphins (Pérez-Jorge et al. 2016) based on photo-identification data collected between 2006 and 2009. Off the southwest coast of Mauritius, a resident population of *T. aduncus* was estimated to number <100 individuals based on surveys conducted between 2008 and 2010 (Webster et al. 2014). Off the coast of Pemba in Tanzania, another small resident population was estimated to number 83 individuals (Kasuga et al. in review) and off the island of Mayotte abundance was estimated from closed population models at 82 ±19 SE individuals from data collected between 2004 and 2009 (Pusineri et al. 2014). Along the coast of La Réunion, an abundance of 72 was estimated based on photo-identification data collected along the west coast from 2009 to 2014 (Dulau et al. 2017).

In South Africa, there appear to be both coastal (with mostly small group sizes) and migratory (with large group sizes) populations of Indo-Pacific Bottlenose Dolphins, but the boundaries between these are not well defined (Cockcroft et al., 2016). Off the coast of KwaZulu-Natal (KZN), the number of individuals in the area between the Tugela River and Durban was estimated at 520 (160–970, 95% CI) in 1989 (Cockcroft et al. 1992). A maximum of 350 individuals was estimated in the area between Durban and Ramsgate (Cockcroft et al. 1991). Overall, Indo-Pacific Bottlenose Dolphins in the KZN area are likely fragmented into several populations (Natoli et al., 2008). A migratory population in southeastern South Africa is estimated at more than 2,000 individuals and is characterised by large groups of hundreds of individuals (Natoli et al. 2008). An estimate of 28,482 based on field work conducted in the mid 1990s was calculated using POPAN mark-recapture analysis of photo-identified individuals in the Algoa Bay region of the Eastern Cape (Reisinger and Karczmarski 2010). Due to the very low number of recaptures (131 out of 1,569 total captures), the estimation models fit the data poorly, which means that the point estimate may not be accurate; however, the large number of identified individuals and small number of recaptures confirms that there was a sizeable population of this species in the wider Algoa Bay region at that time. Group sizes of Indo-Pacific Bottlenose Dolphins in Algoa Bay are consistently large for this species, being reported as typically ranging from 200-600 individuals (Ross 1982; Melly et al. 2017; Bouveroux et al. 2018). It is important to note that with intensifying fisheries and coastal development, the relatively favourable status of these dolphins in Algoa Bay could be very different now, 20+ years after the data used to generate the estimate by Reisinger and Karczmarski (2010) were collected.

HABITAT AND ECOLOGY

Indo-Pacific Bottlenose Dolphins generally occur over shallow coastal waters on the continental shelf or around oceanic islands. In some locations, they occur relatively far from shore, but in the shallow waters of reef banks (Kiszka et al. 2012). In comparison to other areas, Indo-Pacific Bottlenose Dolphins off the coast of Bangladesh occur in relatively deep offshore waters at the head of the Swatch-of-No-Ground submarine canyon where they were detected at an average depth of 202m (Smith and Mansur 2013). In the Clarence River estuary and Richmond River estuary in northern New South Wales, Australia, dolphin distribution varied according to season and tidal state (Fury et al. 2008). Along the coast of Adelaide, South Australia, dolphins occur in shallow nearshore areas and temperate reefs in summer, shallow nearshore areas in autumn and deep waters further offshore in winter (Zanardo et al. 2016). In Coffin Bay, Thorny Passage Marine Park, South Australia, dolphins showed no distinct seasonal shifts in distribution patterns and areas of high probability of dolphin occurrence were located mainly within the inner area of Coffin Bay, associated with shallow waters (2-4m and 7-10m) and located within 1km of land (Passadore et al. 2018a). Strong site fidelity and restricted ranging patterns are characteristics of some populations (Passadore et al. 2018b).

Indo-Pacific Bottlenose Dolphins sometimes occur in mixed groups with Common Bottlenose Dolphins, Indian Ocean Humpback Dolphins (*Sousa plumbea*), Spinner Dolphins (*Stenella longirostris*), Australian Humpback Dolphins (*Sousa sahulensis*) and possibly other delphinids (Jefferson et al. 2015; Koper and Plön). They feed on a wide variety of schooling, demersal and reef fish, as well as cephalopods (Ross 1984; Amir et al. 2005; Yamazaki et al. 2008). In some locations, large predatory reef fish can represent an important proportion of their diet (Belonidae and Carangidae), such as around the island of Mayotte, in the SW Indian Ocean (Kiszka et al. 2014). Group size is generally less than 30 (see Jefferson et al. 2015, for a review), but in South Africa mean group size in Algoa Bay is 76, and groups of up to 600 individuals are commonly observed (Bouveroux et al. 2018, Melly et al. 2017).

THREATS

Bycatch is the dominant threat affecting Indo-Pacific Bottlenose Dolphins throughout their range. However, there are very few estimates of mortality rates or abundance over time to evaluate the severity of the impact. In Australia, the major threats include bycatch in trawls and gillnets as well as in shark nets set at popular coastal beaches to protect bathers (Hale 1997, Paterson, 1990). A total of 15 Bottlenose Dolphins (species unknown) were confirmed to have died from net entanglement in southern blue-fin tuna feedlots between 1994 and 2000 (Kemper and Gibbs 2001). Research by Mintzer et al. (2018) into the global use of cetaceans as bait in fisheries reported that this practice is much more widespread within Taiwanese fisheries than is presently recorded. From 1974 to 1986, the Taiwanese shark and tuna gillnet fishery exploited the waters off northern Australia, including the Arafua and Timor Seas and was responsible for the incidental catch of a variety of small cetaceans, with *Tursiops spp*. likely aduncus comprising 60% of the total cetacean catch (Harwood & Hembree 1987). The annual mortality of Indo-Pacific Bottlenose Dolphins may have exceeded 2,000 animals – severely impacting local population[s] (Young and Iudicello, 2007). As a result of this bycatch, the fishery was closed in 1986 (Young and Iudicello, 2007).

Off western Kyushu, Japan, mortality of Indo-Pacific Bottlenose Dolphins in bottom-set gillnets was estimated at 12-14 individuals per year, which was considered unsustainable for the local population thought to number only somewhat more than 200 individuals (Shirakihara & Shirakihara 2012). Photo-identification data collected off the coast of Bangladesh indicated that 28.2% of identified individuals had injuries related to entanglement gear (Mansur et al. 2012), and similar methods used in the coastal waters of Mayotte (Comoros archipelago, Mozambique Channel) showed that 19% of identified individuals bore signs of non-lethal interactions with coastal artisanal fisheries (Kiszka et al. 2008). In Bangladesh, between August 2016 and April 2018, 31 small-scale gillnet fishing vessels participating in a Citizen Science Fishermen Safety Network reported fatal entanglements of 14 dolphins and porpoises, of which seven were Indo-Pacific Bottlenose Dolphins, during 177 fishing trips (Wildlife Conservation Society 2018). Off the island of Zanzibar (Tanzania), 43 Indo-Pacific Bottlenose Dolphin captures in artisanal drift gillnets were reported from 1995 to 1999. The magnitude and population-level impact of gillnet bycatch in Zanzibar was assessed in 2003-2004, and it was found that annual bycatch rates were unsustainable as they represented 9.3% of the estimated local population of Indo-Pacific Bottlenose Dolphins (Amir 2010). Bycatch was also evaluated recently in drift gillnets

off Zanzibar using landing data (Temple et al. 2019), and there are reports of Indo-Pacific Bottlenose Dolphin mortalities in coastal artisanal fisheries off mainland Tanzania, Kenya, and Mozambique (Kiszka 2015, Kiszka et al. 2009). Bycaught dolphins are often used as bait in longline fisheries targeting sharks (Mintzer et al. 2018, Braulik et al. 2017).

In KwaZulu-Natal, South Africa, an average of 34 Indo-Pacific Bottlenose Dolphins per year were accidentally killed by bather protection nets around beaches between 1981 and 1989 (Cockroft 1990). This increased to an average of 45/year from 1990-1999, and from 2000-2009 the estimate was 27/year (Cliff & Dudley 2011). In general, catches have steadily declined since the 1980s due to better management of nets and the replacement of some shark nets (gillnets) with drumlines (baited hooks) in recent years (Plön, unpublished). However, the majority of bycaught animals are immature individuals and mature females, raising concern about population-level impacts (Plön, unpublished). In most areas limited data on bycatch or a lack of information on population size means that it is not possible to determine whether annual catch rates are sustainable or not. However, the strong overlap in gillnet fishing effort and the coastal distribution of this species, combined with fairly small population sizes in many areas that have been surveyed, suggest that fishery bycatch is sufficiently high to cause population declines in many places.

The species' near-shore distribution makes it vulnerable to environmental degradation, direct exploitation, and fishery conflicts (Curry and Smith 1997, Wells and Scott 1999; Reeves et al. 2003). Until hunting was outlawed in 1990, *Tursiops aduncus* was the target of a large-scale drive fishery in Taiwan's Penghu Islands. Indo-Pacific Bottlenose Dolphins occur in southern Japan and due to confusion with the commonly hunted Common Bottlenose Dolphin it is not clear whether they were ever specifically targeted by Japanese coastal cetacean fisheries in the past (Kasuya 2017). Some Indo-Pacific Bottlenose Dolphins are taken in the small cetacean fisheries in Sri Lanka (Ilangakoon 1997) and Indonesia (Mustika 2006). Socio-ecological interview surveys in southwest Madagascar in 1999 indicated extensive hunting of coastal dolphins by Anakao fishermen of the Vezo community (Andrianarivelo, 2001). Dolphin species most often taken were the Spinner Dolphin, the Indo-Pacific Bottlenose Dolphin and Indian Ocean Humpback Dolphin. Vezo fishers hunted coastal dolphins for local consumption and sale of meat (Cerchio et al. 2015). Andrianarivelo (2001) estimated that over 6,000 individual dolphins, predominantly *Stenella spp.* and *Tursiops spp.* were taken in drive hunts between 1985 and 1999 from a single village, Anakao, and there was a substantial increase in catches evident during 1995-1999 accounting for 57% of all catches (Cerchio et al. 2009). The trend suggested an increase in intensity of hunting and impact on populations, likely associated with a change in hunting technique (from harpoons to nets) in the mid to late 1980s, and depletion of other food resources (e.g. decrease in fish populations), and subsequent increased adoption of cetacean hunting and consumption throughout the 1990s (Cerchio et al. 2015). Subsequent interview surveys conducted between 2010-2013 demonstrated continuing high levels of both hunting and by-catch reported for *Tursiops spp.* along the entire west coast of Madagascar (Cerchio et al. 2015). Indo-Pacific Bottlenose Dolphins were one of the most common species targeted by a drive-hunt in Zanzibar that stopped in 1996 (Berggren et al. 2007, Stensland and Berggren 2007). Anecdotal evidence suggests that several species of delphinids are hunted in the Seychelles (despite national prohibition), including Indo-Pacific Bottlenose Dolphins (Kiszka 2015). Although illegal, Indo-Pacific Bottlenose Dolphins were recorded as hunted in a harpoon fishery in southern Myanmar with six carcasses documented as being sold in March 2006 at the Maungmagan market (Tint Tun 2006). This species is one of the more common small cetaceans that are used as bait to catch sharks. There is no current evidence of traditional use/trade for consumption or medicinal use across the species range in Australia although it may have happened in the past.

Indo-Pacific Bottlenose Dolphins are among the cetacean species most commonly kept in captivity in Asia (Wang et al. 1999, Reeves et al. 2003). Since the early 1960s, live-captures of *T. aduncus* for oceanarium display have occurred in many areas, including South Africa, Australia, Taiwan, Japan and Java (Best and Ross 1984, Tas'an and Leatherwood 1984, Reeves et al. 1994, Cawthorn and Gaskin 1984, Kasuya et al. 1984). In 1974, 58 Indo-Pacific Bottlenose Dolphins were captured from Amami Oshima, Japan, for the Okinawa Expo and the aquarium which held them became the Churaumi Aquarium in Okinawa (Kasuya et al. 1984). In 2003, a live-capture export trade was initiated in the Solomon Islands and a minimum of 108 Indo-Pacific Bottlenose Dolphins were exported between 2003 and 2011 to Mexico, UAE, China, the Philippines and Singapore (Oremus et al. 2013; Parsons et al. 2010). This level of removals from the local population(s) is probably unsustainable (Reeves & Brownell 2009). In the mid 2000s in Australia, 32 Bottlenose Dolphins, including both *T. aduncus* and *T. truncatus*, were held at Sea World, Surfers Paradise, Queensland, and four Tursiops aduncus were kept at Pet Porpoise Pool, Coffs Harbour, New South Wales (International Species Information System 2009). In China in 2014, 39 captive facilities housed 491 cetaceans, most of them *Tursiops spp.* most from Japan and not *T. aduncus* (Chinese Cetacean Alliance 2015). Twenty-three Indo-Pacific Bottlenose Dolphins are held at Ocean Park in Hong Kong, and one in Sea World, Durban (www.Species360.org, reported March-2019).

In South Africa, of the six dolphin species incidentally captured in shark net installations or stranded off the east and south coasts between 2005 and 2009, Indo-Pacific Bottlenose Dolphins had the second highest levels of persistent organochlorines and approximately half of adult *T. aduncus* had PCB concentrations above the previously determined threshold for impairment of immune functions in aquatic mammals (Kannan et al. 2000; Gui et al. 2016); however it is important to note that other small cetaceans often report levels much higher than this. Despite this, systematic health assessments conducted on animals incidentally caught in shark nets between 2010 and 2012 indicated that Indo-Pacific Bottlenose Dolphins were generally in good health (Lane et al., 2014). In Zanzibar, levels of organochlorine pesticides in Indo-Pacific Bottlenose Dolphins were lower than those reported from other regions, but methoxylated polybrominated diphenyl ether levels were higher (Mwevura et al. 2010). Along the coast of La Réunion, DDTs, PCBs, and methoxylated-PBDEs were commonly found in blubber tissues of Indo-Pacific Bottlenose Dolphins (Dirtu et al. 2016). However, concentrations were low compared to other locations, including Zanzibar (Mwevura et al. 2010).

Several diseases appear to be increasing in occurrence in coastal small cetaceans, raising concern for the health of these animals. Since the early 2000s, there have been several dolphin mortality events in Australia that have included *T. aduncus* (Kemper et al. 2016). In these events all the dolphins tested positive for the cetacean morbillivirus. There are reports of a lobomycosis-like disease and other poor skin conditions in Indo-Pacific Bottlenose Dolphins from Mayotte and Japan which is a concern for these locally restricted populations (Kiszka et al. 2009, Van Bressem et al. 2013, Tajima et al. 2015). The etiology of the disease was not established, but it may be related to the degradation of their coastal habitat (Kiszka et al. 2009). The bacterial pathogen of the genus Brucella has also been reported from Indo-Pacific Bottlenose Dolphins. Forty of 58 serum samples from *T. aduncus* from the Solomon Islands tested positive for antibodies to Brucella (Tachibana et al. 2006). This pathogen in dolphins can be a severe disease and cause abortions, male infertility, neurobrucellosis, cardiopathies, bone and skin lesions and death (Moreno et al. 2012).

Climate change, especially increases in sea surface temperature that are prevalent throughout coastal areas of the Indian Ocean, are negatively affecting coastal habitats such as coral reefs and seagrass beds used by Indo-Pacific Bottlenose Dolphins. For example, in Shark Bay, Western Australia, an unprecedented marine heatwave in 2011 caused catastrophic losses of seagrass meadows along with mass

mortality in invertebrate and fish communities. Long-term demographic data on Shark Bay's resident Indo-Pacific Bottlenose Dolphin population revealed a significant decline in female reproductive rates following the heatwave (Wild et al. 2019).

Indo-Pacific Bottlenose Dolphins are among the species most commonly targeted by dolphin-watching operators in the Indo-Pacific region and in some places where regulation is poor, the animals are harassed. Although dolphin-watching tourism is certainly not a threat to the species as a whole, changes in dolphin behaviour have been observed in areas with intense dolphin-watching activity off Amakusa-Shimoshima Island, Japan (Matsuda et al. 2011) and in Menai Bay, Zanzibar (Christiansen et al. 2010) and around Mauritius (Webster et al. 2014). In Shark Bay, Western Australia, an increase in dolphin tourism coincided with a 14.9% decline in local dolphin abundance (95% CI=−20.8 to −8.23) (Bejder et al. 2006).

The disturbance caused by marine construction and demolition, port development, reclamation, dredging, and other forms of habitat destruction and degradation, together with associated anthropogenic noise, is hard to quantify, but such activities and processes are widespread throughout the coastal range of this species. Individually and cumulatively, they may be causing population declines through increased mortality, impaired health, and/or reduced reproductive fitness as well as by habitat displacement.

USE AND TRADE

They are harvested for food in some places, and for international trade as display animals.

CONSERVATION ACTIONS

Specific conservation actions for this species are lacking from most of the range of the species although they are generally legally protected in most range states. Due to increasing pressure of dolphin watching tourism in Mayotte, specific measures prohibiting swimming with this species have been implemented. In Australia dolphin watching is regulated and there are National Whale and Dolphin Watching Guidelines in place. In other parts of the species range where there are dolphin watching or swim-with-dolphins tourism these are either unregulated, or there has been some effort to manage or regulate the activities but guidelines are not followed. This species occurs in numerous Marine Protected Areas (MPAs) throughout their range but these are usually designed with a focus on other marine species and not specifically to include key habitat for Indo-Pacific Bottlenose Dolphins.

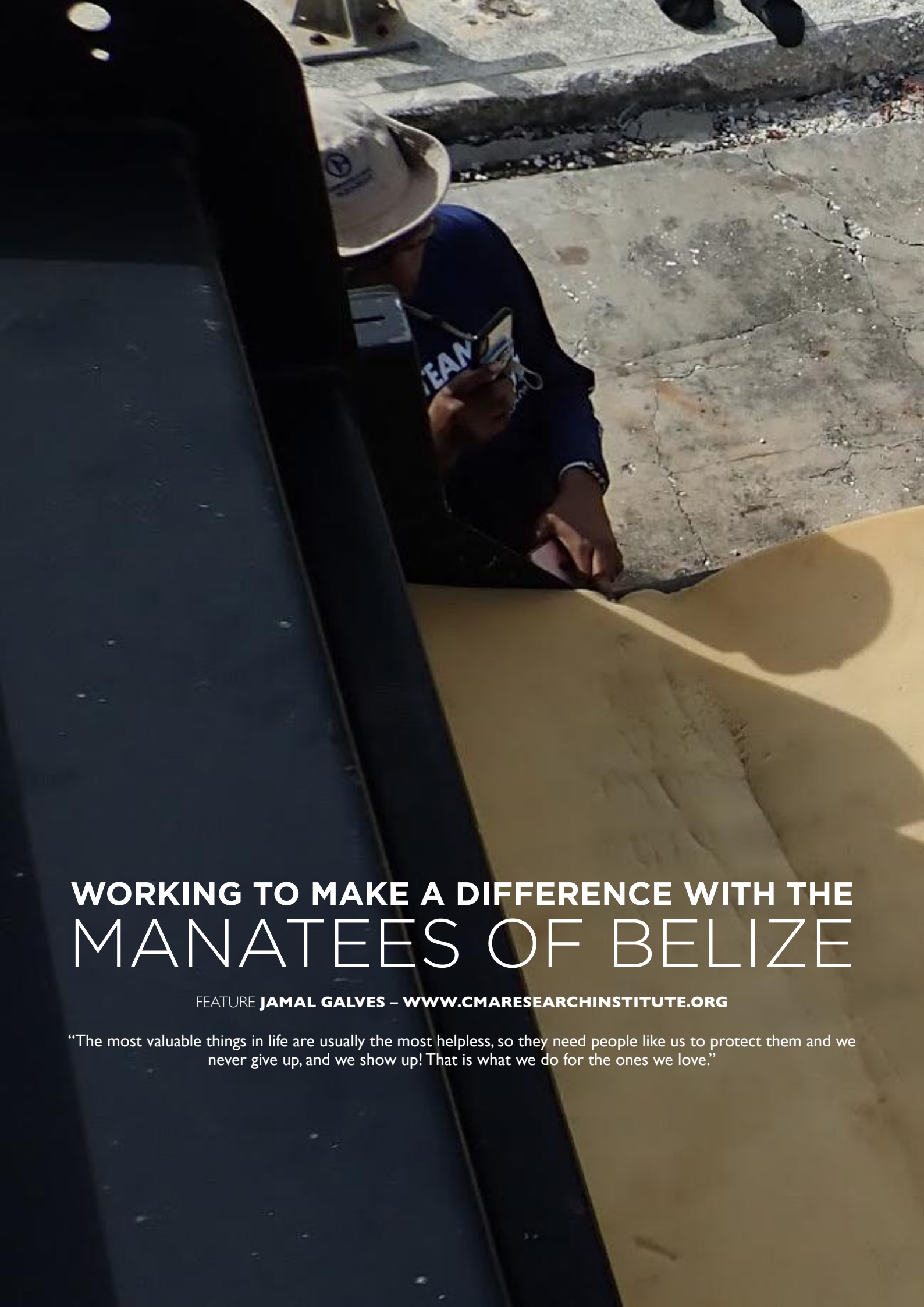
The exception to this is an MPA declared by the Government of Bangladesh in 2014 covering 1,700km² which encompasses almost all Bottlenose Dolphin sightings made during intensive cetacean surveys of coastal waters in Bangladesh between 2004 to 2019. Efforts are still underway to establish conservation management in this MPA. One promising approach for reducing Indo-Pacific Bottlenose Dolphin bycatch in Bangladesh is an initiative that requires gillnet fishermen to attend their nets, release entangled dolphins, and collect data from mortalities in exchange for capacity building to improve their safety at sea.

Various strategies have been tested to mitigate the unintentional catch of dolphins in coastal bather protection nets in South Africa. Devices have been added to the nets to make the nets more conspicuous acoustically (for example, air-filled floats, clangers), or to deter the dolphins with sounds (such as pingers), but these were not successful (Cliff and Dudley 2011). In the past decade, some gillnets have been replaced with baited hooks (called drumlines) which have lower dolphin bycatch (Cliff and Dudley 2011).

In Australia bycatch action plans for several fisheries were introduced in 2001 to reduce the bycatch of dolphins and other marine animals and these actions are managed by the Australian Fisheries Management Authority. Mitigation measures, such as the use of pingers to warn animals away from nets, escape panels in purse seine nets, and handling methods for animals brought aboard vessels have been proposed. Pingers are currently used to warn cetaceans away from shark nets installed to protect bathers in Australia (Department of Environment 2019).

CITATION

Braulik, G., Natoli, A., Kiszka, J., Parra, G., Plön, S. & Smith, B.D. 2019. *Tursiops aduncus*. The IUCN Red List of Threatened Species 2019. **www.iucnredlist.org**



WORKING TO MAKE A DIFFERENCE WITH THE MANATEES OF BELIZE

FEATURE **JAMAL GALVES – WWW.CMARESEARCHINSTITUTE.ORG**

"The most valuable things in life are usually the most helpless, so they need people like us to protect them and we never give up, and we show up! That is what we do for the ones we love."


RESCUE
CLEARWATER

Jamal Galves has always been fascinated by manatees. As a young boy, he would spend long hours on his grandparents' lawn in the small village of Gales Point Manatee, and watch the gentle giants swim through the lagoon. His imagination flooded his young mind with the thought of manatees. He dreamt of one day being able to work with these gentle giants, and he didn't have to dream for long as his dream soon became a reality at a very young age.

The year Galves had turned 11, he strolled down to the dock where a manatee research team would leave from each morning and he approached the man he believed to be in charge. That man's name was Dr James "Buddy" Powell, whom Jamal later found out, was a renowned manatee conservationist. Jamal forwardly asked him if he could join the team. Considering his young age, Powell was reluctant to accept initially, but after many attempts from the persistent young Galves, Powell allowed him to hop aboard the boat and join the research team. The team began to notice Galves' enthusiasm for their line of work. He came back day after day, eager to learn more, and help wherever he could.

At the age of 16, Galves was officially hired as a field assistant by the research team of the Clearwater Marine Aquarium Research Institute (CMARI), formally known as the Sea to Shore Alliance. Today, Galves is now the Programme Coordinator for CMARI's Belize field office and he has committed his life to working with endangered manatees to preserve their coastal environment.

Galves has received a lot of recognition and awards for his work in conservation, including the Belize National Hero Award, Oceana Belize Ocean Hero, World Wildlife


TEAM SEAFLIES

Foundation Planet Hero, The Dodo Hero, and the National Geographic Explorer to name a few. He was recently awarded the 2021 Wildlife Conservation Society Christensen Conservation Leadership Scholarship, and is now pursuing a Masters degree in Coastal Science and Policy at the University of California, Santa Cruz.

Manatees in Belize face numerous threats, including, but not limited to: watercraft collisions, habitat destruction, pollution, and poaching. The plight and the importance of these gentle giants are unknown by many. Galves works to continuously raise awareness about manatees and conducts research to better understand them. The information gathered is used to influence policies and lobbies to gain better protection for this endangered species and their ecosystem. Galves' research has been used to lobby for, and successfully put in place, speed limits in areas well-known to be frequented by manatees.

Despite the many perils faced by manatees in Belize and beyond, Galves remains hopeful for this species' survival and is committed to his life's journey to ensure their future. "As a child I never would have thought manatees would be endangered, nor did I fully understand the levity of the term. Over time, I learned how one person could truly make a difference and help to protect a species. That is why I do what I do. To make a difference," said Galves. Ultimately, he wishes to inspire the next generation through his efforts and determination to save this species. "The most valuable things in life are usually the most helpless, so they need people like us to protect them and we never give up, and we show up! That is what we do for the ones we love."

FOR THE OCEANS

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YOUR EYES, YOUR DATA:

CITIZENS HELP SCIENTISTS GAIN KNOWLEDGE ABOUT CETACEANS IN THE ARABIAN GULF

FEATURE **BRYANA COPE & ADA NATOLI, UAE DOLPHIN PROJECT & ZAYED UNIVERSITY**

The UAE Dolphin Project is continuously accepting reports of any cetacean species spotted within the Arabian Gulf and Arabian Sea. If you or someone you know frequently goes out and enjoys these waters, please be on the lookout for these species.

PREVIOUS PAGE AND ABOVE: Humpback Dolphins sighted in-3between the Burj Al Arab and the Palm Jumeriah in November 2014. Photos by Ada Natoli.

In a world highly reliant on technology and social media to constantly be connected to each other, citizen science is thriving. With public engagement the same technology has proven extremely effective to connect citizens to scientists. This allows for data to be gathered on the natural world, including endangered species that would otherwise be difficult to collect.

The relationship is simple: many eyes mean many sightings, which when properly reported, translates to more data for scientists. For big marine species this is crucial as the sea is vast and the chance to encounter these animals is generally slim, especially for rare species. Additionally, dedicated surveys are expensive, time consuming, and obtaining the necessary funding is usually a struggle.

Here in the UAE, citizen science efforts are proving to be a highly successful tool in aiding scientific research of cetaceans. In a newly published paper in marine mammal science, 'Citizen Science Data of Cetaceans in the Arabian/Persian Gulf: Occurrence and Habitat Preferences of the Three Most Reported Species (Natoli et al. 2021)', the importance of citizen science is showcased like never before in the region. This study represents the first long-term citizen science survey involving data collection of cetaceans in the UAE and the Arabian Gulf.

Following a public awareness campaign run by the UAE Dolphin Project Initiative since 2012, thanks to the support of many stakeholders, Dr Ada Natoli and colleagues were able to gather over 1,200 reports from the public of whale and dolphin sightings crossing the UAE waters and neighbouring countries. This allowed scientists to gain a better understanding of the species occurrence, and for the most common ones, how they utilise these waters and are related to one another. It also allowed for some significant discoveries for species considered rare. Overall, 12 species were reported from the public across the UAE Indian Ocean and the Gulf waters, including Risso's Dolphin (*Grampus griseus*), Spinner Dolphin (*Stenella longirostris*), False Killer Whale (*Pseudorca crassidens*), Common Bottlenose Dolphin (*Tursiops truncatus*), Common Dolphin (*Delphinus delphis tropicalis*), Bryde's Whale (*Balaenoptera edeni*) and Sperm Whale (*Physeter macrocephalus*).

Several Killer Whale (*Orcinus orca*) sightings were reported and proved that this species, although rare, is likely regular in the Gulf. They also allowed scientists to confirm that this species migrates across the Northern Indian Ocean. Amazingly, the photographic material shared by the public enabled scientists to recognise individuals first recorded in Abu Dhabi waters in 2008, then in Sri Lanka in 2015 and back again in UAE waters in 2019. This suggests that specific pods may utilise the Gulf waters regularly over the years.

An astonishing sighting of a Humpback Whale (*Megaptera novaeangliae*) mother and calf in front of Kite Beach, Dubai was also reported by the public in 2017. This is the first record of living individuals of this species in the Gulf and supports the theory proposed by scientists, that the Gulf is part of their regular home-range. It is also the first record of a mother and a calf of this species in the whole northern Indian Ocean, sparkling hope on this species' possible recovery. The Arabian Sea Humpback

Humpback Dolphins sighted on November 2013 in front of the Burj Al Arab, Dubai. Photo by Ada Natoli.

Whale is in fact the only Humpback Whale population in the world that does not migrate and mix with the other populations. Its population is estimated to only have about 100 individuals left due to extensive whaling that occurred in the past century, and it is considered Endangered according to the IUCN Red List.

The public sightings have also made it possible to identify the species that most commonly utilise the UAE coastal waters, and which one is more at risk. Three species regularly occur in UAE coastal waters: a porpoise, the Indo-Pacific Finless Porpoise (*Neophocaena phocaenoides*), and two dolphin species: the Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*), and the Indian Ocean Humpback Dolphin (*Sousa plumbea*).

Thanks to the high number of sightings reported, scientists have been able to correlate the presence of each species to marine environmental variables (water temperature, silicate, calcite, pH, distance from coast, bathymetry, chlorophyll) and conduct what is called an "ecological niche modelling" analysis. The environmental variables are basically proxies for the real biological determinants of species habitat use. As apex predators, dolphin's habitat preferences are effectively related to those of its preferred prey. The results suggest that while the finless porpoise may sit in a different niche, as its diet requirements appear to be different from the other two species (their presence is correlated to a different set of variables than the other two), the bottlenose and humpback dolphins may compete for the same food resources, but they separate by different patterns of spatial use. Humpback Dolphins are strictly confined to waters in close proximity to shore, particularly to areas with complex networks of inland channels with shallow waters, whereas the Bottlenose Dolphin utilises a broader range of space, including waters around offshore islands.

These results ring an alarm bell. Humpback Dolphins have the narrowest area of suitable habitat, and it overlaps with areas heavily utilised by humans, like the near shore waters of the main cities of Dubai and Abu Dhabi. This makes this species at a high risk of disappearance, especially considering the relatively small population estimates reported by other studies. The Environment Agency – Abu Dhabi (EAD) estimated a population of 701 Indian Ocean humpback dolphins (95% CI [473,845]), this may be the biggest population of Humpback Dolphins estimated so far, however the number of individuals is still very low to ensure long term viability, particularly if their preferred habitat is heavily impacted by human activity, such as land reclamation and disturbance. According to the IUCN Red List, the Indian Ocean Humpback Dolphin is considered Endangered across all its range, this species is urgently in need of dedicated conservation measures to ensure its survival.

SO, WHAT'S NEXT?

Since 2019, thanks to the sightings reported by the public, a large portion of the UAE coastal waters are now internationally recognised as Important Marine Mammal Areas (www.marinemammalhabitat.org/immas/). This is a great achievement as it is a formal recognition of their presence that cannot be oversighted during decision making processes. In the UAE, marine mammals are protected under

ABOVE: Bottlenose Dolphins sighted just in front of Atlantis the Palm, Dubai in April 2014. Photo by Ada Natoli. **BELOW LEFT:** Mother and calf Humpback Whale in front of Kite Beach, Dubai, reported by the public on October 2017. **BELOW RIGHT:** Finless porpoise sighting during the 2021 survey, just off Jumeriah Beach, Dubai. Photo by Ada Natoli. **OPPOSITE PAGE:** Humpback Dolphin sighted in December 2013 just offshore Dubai. Photo by Ada Natoli; A pod of Killer Whales was sighted and reported in 2019 in the waters around Moon Island. Two individuals, a male and a female had already been sighted in Abu Dhabi waters in 2008. Photo by Ghait Al Khaja; Mother and calf Humpback Whale in front of Kite Beach, Dubai, reported by the public on October 2017.

federal law (No. 23, Article 28, 1999) which states "it is impermissible to catch whales, sea cows, and other sea mammals of all species and size". The results obtained in this study are a crucial step forward in guiding the formulation of conservation measures, that will be critical for the protection of these important marine species and the designation of future dedicated MPAs.

Further research is needed to better define each species' major threats and to be able to specifically act upon them in order to minimise the impact on their survival. Especially for the Finless Porpoise, more data is needed to better estimate their status in the region, as so little is known about this elusive species worldwide.

U.A.E. DOLPHIN PROJECT

HOW TO GET INVOLVED

The Report a Sighting Initiative is still on and we depend on you!

The UAE Dolphin Project is continuously accepting reports of any cetacean species spotted within the Arabian Gulf and Arabian Sea. If you or someone you know frequently goes out and enjoys these waters, please be on the lookout for these species. All we require is the date and approximate time and location (if GPS coordinates are not available, a description of where you are will suffice) and if you can, the approximate size of the group you saw. If you are able to capture any photos or videos, that would help us tremendously.

Please Email any reports to:
sighting@uaedolphinproject.org
Or WhatsApp to: **+971 566 717 164**

For more information on how to report, or how to volunteer, please visit:
www.uaedolphinproject.org.

Check out our Species ID Booklet here:
https://bit.ly/3cujk44

ACKNOWLEDGMENTS

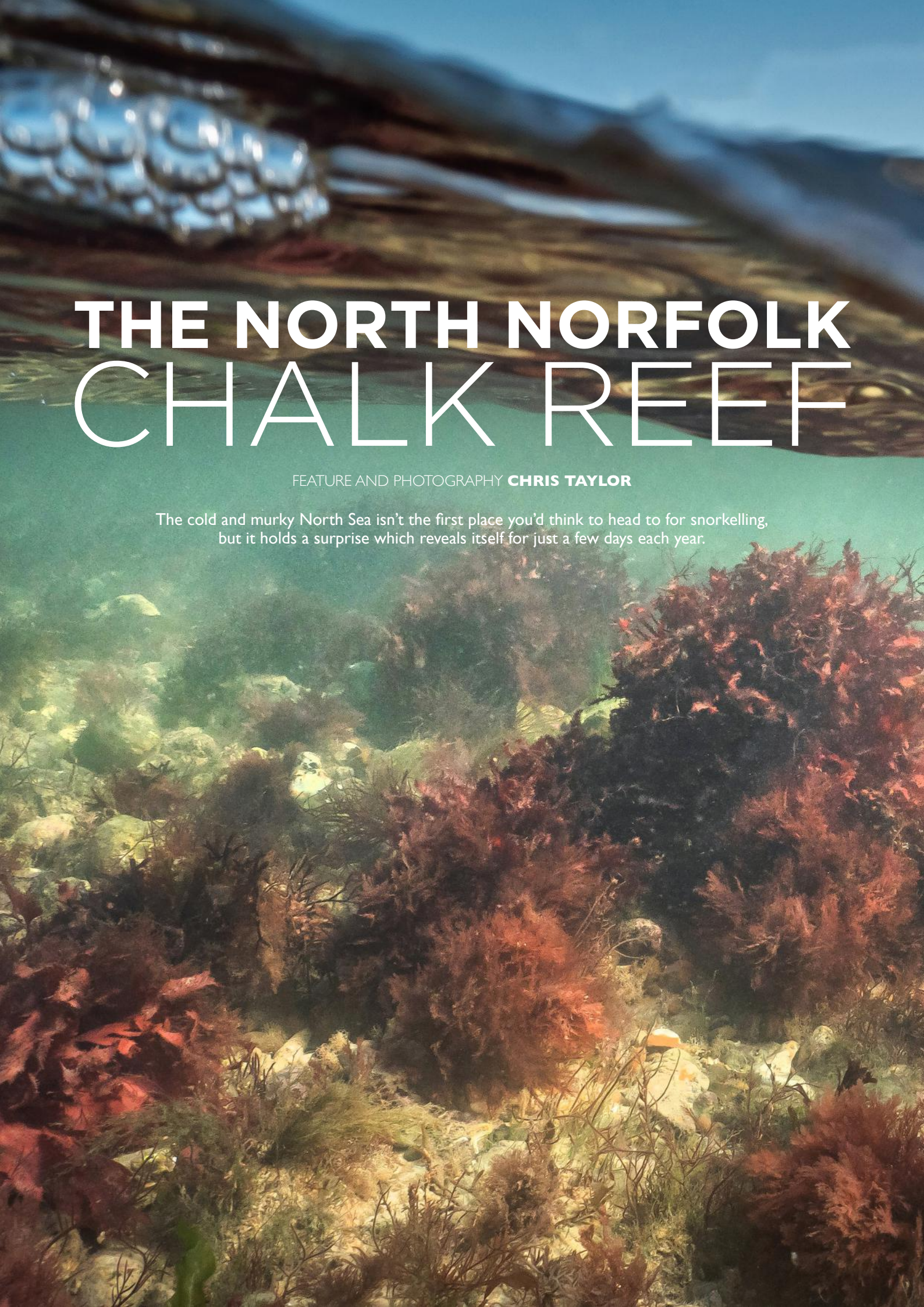
This would have never been possible without the support of many stakeholders. We would like to thank Superprogetti for the IT support; Dubai Municipality, ITP Publishing, Emirates Diving Association, Dubai Marina Yacht Club, Park Hyatt Abu Dhabi Hotel and Villas, BAKE Saadiyat Public Beach, Dubai Natural History Group, and Emirates Natural History Group for supporting the UAE Dolphin Project Initiative awareness campaign; George Casson, Peter Neilson, Gareth MacGellon, and everyone that reported sightings through the UAE Dolphin Project Initiative channels; Ayse Demirer, and all the volunteers that dedicated their time to work on the 'Report a Sighting' campaign.

Thank you again to everyone that reported sightings and has supported the 'Report a Sighting Campaign'. Together we can make a difference for the whales and dolphins of the Arabian Gulf!

THE NORTH NORFOLK CHALK REEF

FEATURE AND PHOTOGRAPHY **CHRIS TAYLOR**

The cold and murky North Sea isn't the first place you'd think to head to for snorkelling, but it holds a surprise which reveals itself for just a few days each year.



The cold and murky North Sea isn't the first place you'd think to head to for snorkelling, but it holds a surprise which reveals itself for just a few days each year.

Much of the year, the water here is like gravy, a murky brown, zero-visibility body of water, not pollution (we receive the Blue Flag for clean waters every year without fail) but sediment stirred up by the water's action.

Being one of the few places in England to face North into the North Sea, we can endure some fierce northerly storms blowing down from the northern latitudes. But for a few weeks in the Summer (if the weather is calm enough), the sediment drops out of the water column revealing a unique underwater ecosystem brimming with natural treasures for those willing to don a mask and snorkel.

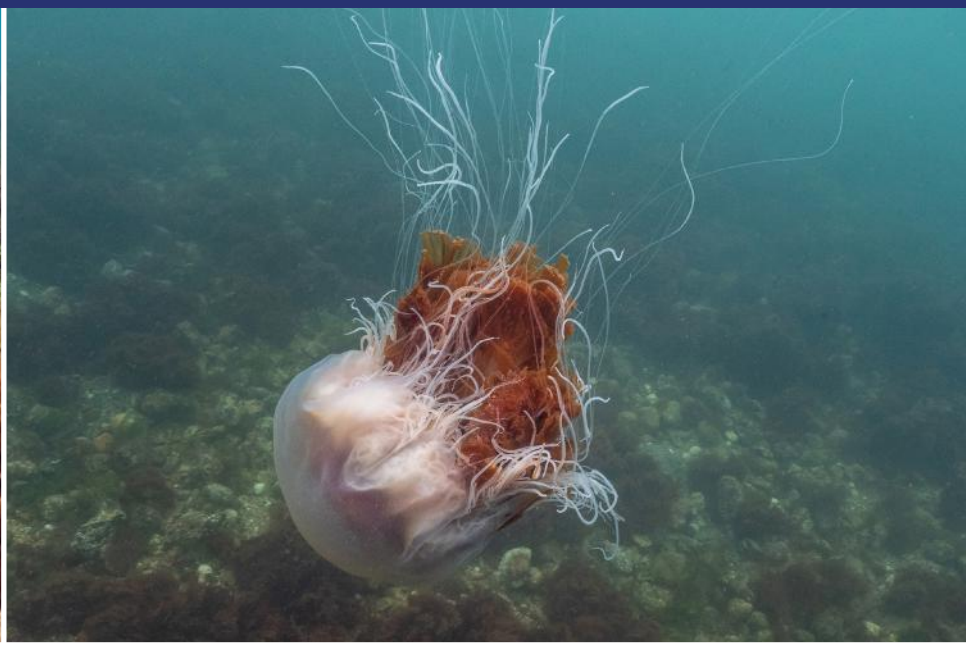
Literally a stone's throw from the low water tideline at Sheringham, is the North Norfolk chalk reef – designated a Marine Conservation Zone (MCZ) in 2016, the 100 million year old chalk reef covers an area of 321km² stretching 10km out to sea, reaching a maximum of 20m depth running from Weybourne in the West, to Happisburgh to the East.

Usually in August (and sometimes September) with the fine summer weather comes very calm seas. It needs a few days of flat water for the visibility to clear (and only takes the slightest swell for the sediment to be stirred up again) but when the water does clear, it reveals a whole world unknown to even many of the lifelong local residents.

I usually aim to time my snorkelling sessions with the low tide, or shortly after (slack tide) when the water currents are minimal and the depth of water allows me to swim down to the bottom and glide along these corridors. One area, known locally as 'The Gullies', offers six feet high walls and arches of chalk teeming with life in around twelve feet of water at a low spring tide. A sunny day helps the clarity and colours for photography hugely, although a night snorkel can be great fun too.

In some areas the chalk forms ridges, arches and perfect holes for lobster, crab and prawn to hide while offering a stable, rough-surfaced, substrate for the various seaweeds, marine plants and sponges. Other areas known as 'pavement' are flat plains of flint and chalk boulders with patches of sand which can provide the opportunity to see flounder and sometimes, tiny cuttlefish.

With England's largest Atlantic grey seal colony just ten miles west along the coast at Blakeney Point, we occasionally see seals while snorkelling although they are usually wary of humans here so they probably see us before



we see them and keep out of sight. Many fish species frequent the chalk reef including large sea bass, mackerel, ballan wrasse, tompot blenny, common eel, greater pipefish, weeverfish, sea scorpion, flounder and many more. They may not be as colourful as their tropical cousins, but to me they are every bit as interesting.

For more than 300 years there has been a crab and lobster fishing industry on this coast. It is said that due to the chalk reef, the crabs and lobsters here have the sweetest flesh of any in the UK. In recent years, the crab industry here has dwindled as less people want to endure the hardship of a fisherman's life, but those that remain manage and protect the reef as a farmer may protect his farm.

In the 1960s, the local fishermen's societies managed to implement a no-trawling by-law which has gone a long way in protecting the ecosystem and soft chalk substrate from the ravages of indiscriminate trawl fishing. The local crab and lobster fishing industry is one of the few worldwide commercial fishing activities with zero by-catch, and has various laws in place to restrict the minimum landing size and protect crustaceans with eggs to ensure a healthy population.

This coast has seen it's fair share of shipwrecks over the years, each with their own fascinating story, some with substantial loss of life, others more fortunate. It was while returning to shore from a snorkel earlier this year that I suddenly noticed large pieces of metal and wood looming out at me in the near distance. Following the wreckage along the seabed I realised it was a substantial shipwreck spanning over 50 metres.

I photographed the wreck as I swam along it and on submitting the photos to local historians, discovered it was the wreck of the SS Commodore, a 120m steamship carrying coal which ran aground here in 1891. Luckily there was no loss of life, but the wreckage and large coal-fired water boiler created a serious hazard for fishermen, so at the start of the last century, it was blown up with dynamite. A historical record describes how large chunks of metal rained down on the golf course set on the cliffs just inland of the wreck!

I had heard stories of this wreck before and have often gone looking for it but had obviously never got the right location until now. It helped that recent sea conditions had scoured away the sand, revealing a lot more of the wreck than had been seen for decades (especially from under the waterline). The photos and video gained a lot of local, national (and international) media interest with the UK BBC News website featuring the video on it's front page for 5 days, and there was even a feature on a morning show on the US TV channel CBS.

Filming the wreck was exciting and it has since been once more covered by sand, maybe not to be revealed again for decades, but my real passion is in seeing the sealife and watching the behaviour. Over recent years, I have been lucky enough to film in the Maasai Mara and Botswana, the excitement of what you will see on an African safari for me is comparable with the surprises under the sea here in North Norfolk.

In recent years I've started taking people along with me snorkelling and produced a YouTube video to offer people tips for safe snorkelling and the best places to enter the water. I enjoy being able to share the wonders of these shallow waters, the people that come along with me are always buzzing after discovering for themselves the magic of the chalk reef.

By educating people about the thriving chalk reef just metres from where they walk on the beach every day, I hope to raise awareness of the ecosystem and the importance of minimising litter and pollution. The chalk reef is a tough environment, enduring the battering of Northerly storms every winter, but this ecosystem isn't designed to deal with plastic and chemicals, so the more that people appreciate the sea isn't a bottomless rubbish tip, the better.

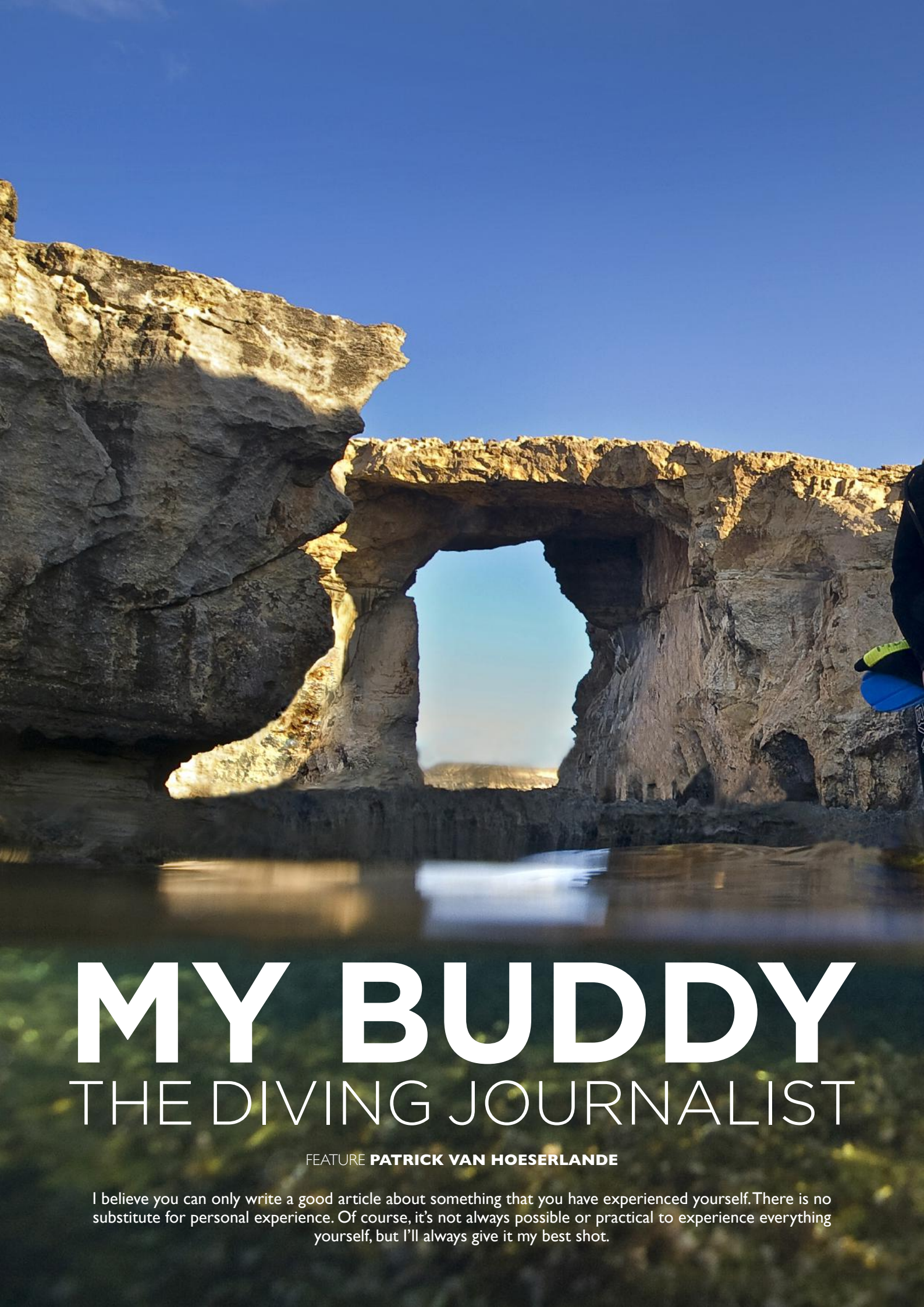
CHRIS TAYLOR
www.christaylorphoto.co.uk

I've been a full-time photographer and filmmaker since 2003, shooting everything from weddings to stately homes, wildlife, tourism brochures and events, but recently I've been moving my work in a direction closer to my heart – travel and maritime imaging.

I've lived in Sheringham on the North Norfolk coast all my life, growing up by the sea, with an obsessed naturalist for a father has meant I've learned to love and understand the wildlife and ecology of the area. I attained an honours degree in Coastal Biology at Hull University in 1993 but life took other turns and I never really put it to use professionally, but the passion for everything coastal has always been there.

I've been snorkelling in the waters here on and off for the last 30 years, although only recently started documenting what I see using underwater cameras. I currently use a Panasonic Lumix GH5 in an underwater housing with a couple of small led light panels for additional light for photos and video.

My videos of the chalk reef can be seen on my YouTube channel here:
www.youtube.com/c/ChrisTaylorfoto



MY BUDDY
THE DIVING JOURNALIST

FEATURE **PATRICK VAN HOESERLANDE**

I believe you can only write a good article about something that you have experienced yourself. There is no substitute for personal experience. Of course, it's not always possible or practical to experience everything yourself, but I'll always give it my best shot.

Photo by Edwin Sanders

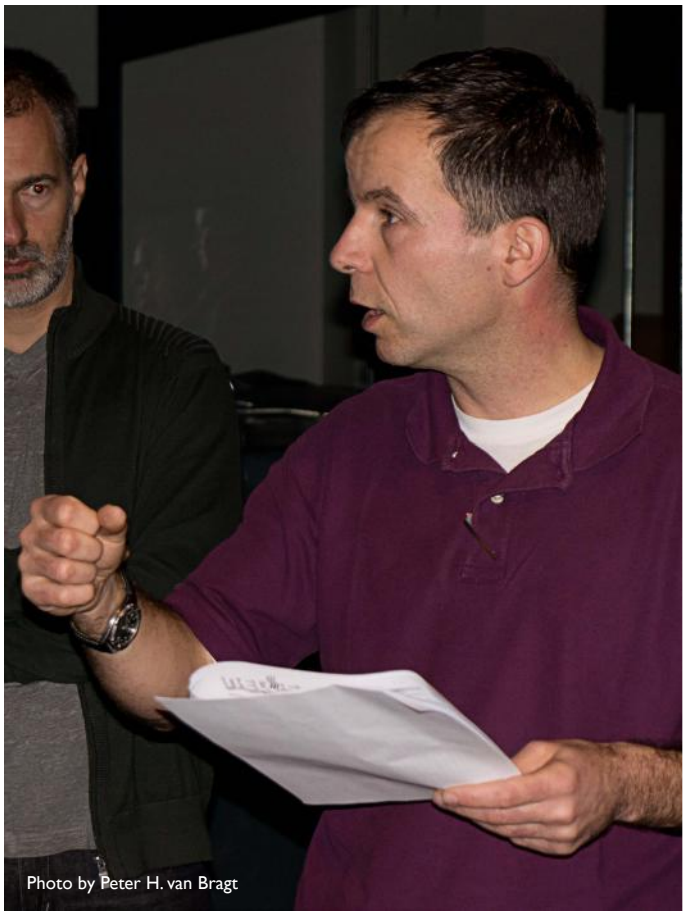


Photo by Peter H. van Bragt

Photo by Jef Driesen

This series has been about discovering unique diving activities, and subconsciously about getting acquainted with the specific niche of my dive buddies. To write this edition, I took advantage of the exclusive position to observe myself during several dives in preparation for my articles.

My name is Patrick Van Hoeserlande for which I am better known as Hoesy, and I am a fan of experiential journalism. I believe you can only write a good article about something that you have experienced yourself. There is no substitute for personal experience. Of course, it's not always possible or practical to experience everything yourself, but I'll always give it my best shot. For example, I followed a professional diving course for two years to write an article about it and get a better understanding of the differences between commercial and recreational diving. I am sometimes however limited as to how far I can take it and may have to interview the person who has experienced it all the way. The interview with Patrick Musimu following his unofficial world record of 209m 'no limits' is such an example. I have successfully followed the freediving course to write about it, but participating in the competitive 'no limits' discipline was a bit too 'deep' for me. It's only when it's not possible to experience the skill entirely, that I resort to consulting sources through articles, books, and the internet. My own stories are also based on experiences with a touch of fantasy of course. For example, the adventures of Skubba & Fred reflected my experiences as a youths' diving instructor.

During my many drives to the dive sites, I think about the combination of journalism and diving. The first time I dove was on my honeymoon and I was bitten by the virus almost immediately. Diving is a dream combination of adventure, technology in the broadest sense of the word, and it's a social activity. Writing has always been a favourite hobby of mine, even outside of diving. I rolled into an editorial board for a divers magazine when I was the editor of a dive club magazine, and from then on, the door to the world of diving was wide open. Being a member of the editorial board makes it easier to get in touch with other divers and people who play important roles in our hobby. Mentioning you write for a dive magazine is a good business card. After all, who doesn't like an article about oneself in a quality magazine?

I cannot tell you how many articles I have published. There must be hundreds, most of them in Dutch, and some in English. I must admit that I mostly focus on the content and not on the spelling which I have two reasons for. Firstly, I don't have an eye for detail. Even though I find spelling a crucial part of the format for a quality magazine, I do not have the energy for such a technicality. The next adventure always calls and I'm too excited to sit still and dwell on minor details. Secondly, I am not very strong in applying the spelling and grammar rules of either language. Fortunately, other members of the editorial board are very skilled in proofreading texts. Every article I write provides additional work for these very dedicated colleagues of mine, and I'm sure I exasperate them when they see me submit a new text for publication. I don't envy them.

I have completed an underwater photography course aimed to take images good enough for publication, but besides knowledge and experience, this also requires an investment which I am not yet ready to take. Photographers always have a device between their eye and their subject. You view the world through your camera's view finder. You also sometimes need to influence your subject's behaviour in order to get a good photograph, and that is inconsistent with the philosophy of experiential journalism. You want to disturb the 'natural' behaviour as little as possible. I sometimes mount an action camera to my dive mask which I set to automatically take a picture every 3 to 5 seconds in the hope to get a few good snapshots out of the hundreds of bad ones. It's not usually the case, but it is effortless, and you never know.

In most cases, I only provide a few land shots taken with a first-generation digital camera which quite frankly also needs an invested upgrade. Luck is usually on my side though, and I often find a diver with the necessary equipment and expertise to get a few underwater stills for the piece. As a last

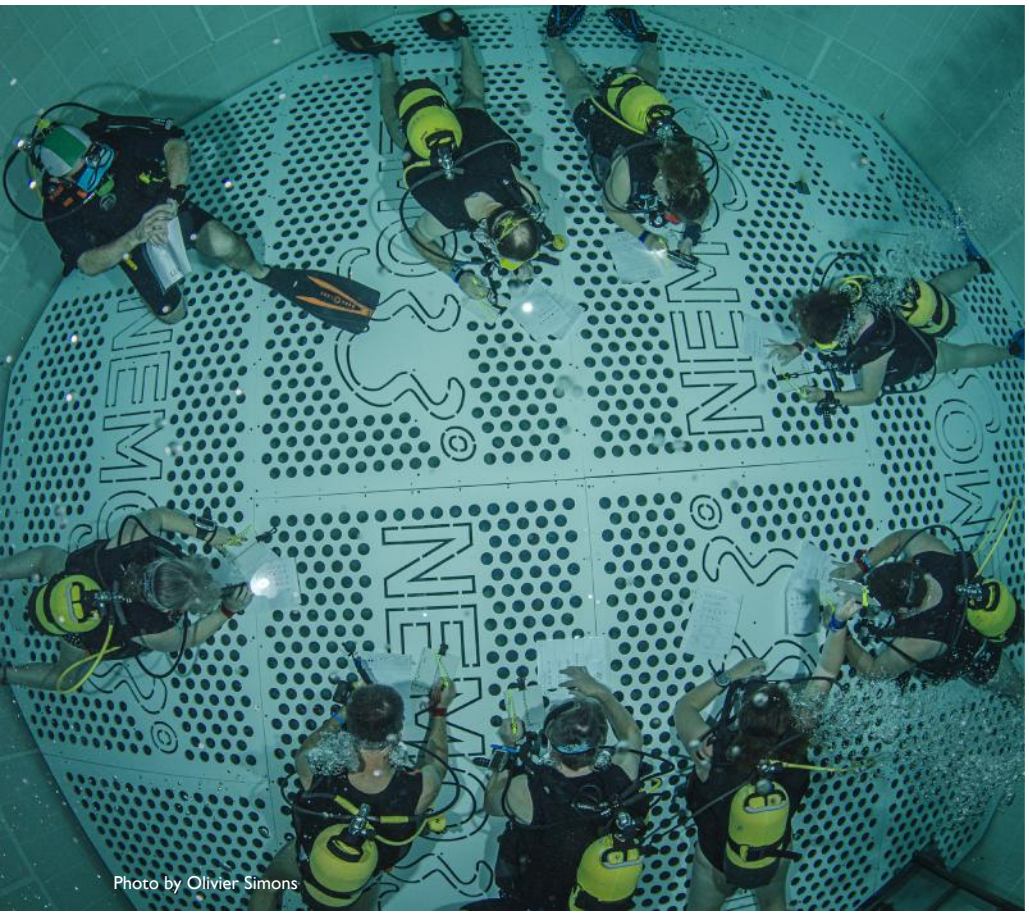


Photo by Olivier Simons


Photo by Edwin Sanders


Photo by Ivo Madder

resort, the editor-in-chief selects 'old' pictures as illustrations. Good articles are the result of teamwork, not of an individual.

I often get asked how I prepare for an article when I'm out in the field, whether I have a notebook to scribble ideas or dictate to my phone voice memos. I never take notes, except when quoting verbatim or during an interview with a famous person because it inspires their confidence in the quality of the final product. But these are exceptions, I don't usually write anything down. It can take weeks or sometimes months before I start writing the article. The secret to remembering what occurred at the time is in the total experience of the activity of the dive. Experience after all, imprints memory. When I write the article after a long period has passed, I simply relive the dive. Of course, the notes in my diver's logbook and the photos – bad ones included – helps to relive the experience if needed.

I admit that it would indeed be a sensible tactic to at least put a draft together straight after the event while the memory is still clear, but it does not work for me. Writing an article is done in my head. It is only when the story line fits in my mind that I can sit down in front of my laptop and usually, write it down in one go. I especially look forward to the day they can implant a USB-connection to me so I can download completed stories from my brain straight to my computer. How fantastic would that be? I don't deny my work ethics give my editor-in-chief frantic headaches as most of my articles are delivered around the publication deadline.

The most difficult question for me to answer is when I get asked about my best experience as a diver-journalist. Each buddy and each dive had something special to offer. I'm afraid that if I don't give someone a mention, the others will think I did not enjoy our dive together, so I'll continue to keep that to myself.

I'm currently living in the United States as an expat with my family. This has allowed me to write several unique articles, but in the field of diving, things have not been great. The diving opportunities are at this moment minimal. I miss my local dive sites such as Put van Ekeren and Zeeland. The only place where I regularly dive now is in the aquarium where I have volunteered to help which will pause this series until further notice. Once I am back in Belgium, I will take the series back on, after all, there are still plenty of niches in our sport left that need to be discovered.

Do not hesitate to get in contact with new and interesting buddy suggestions. It may take a while before I dive with them, but I will not hesitate when the opportunity arises. Suggestions for dive sites or interesting divers to contact in the USA are also welcome. Email me at **patrick.vanhoeserlande@nelos.be**. See you on the waterfront, somewhere in this big old world of ours!

ABOUT MY BUDDY

Diver: Patrick Van Hoeserlande
Year Started to Dive: 1992
Number of Dives: 600
Dive Club: Amfibie, Turnhout
Certification: 2* Instructor
Other Certifications: Youth and Nitrox Instructor, Commercial Inshore Diver, SSI Solo Diver, Extended Range Diver, 1* Underwater Video and photography, Lifeguard, 2* Boat Lifeguard, 2* Free Diver.
Special Equipment: OMS wing with a bi 20 litres.
Favourite Local Dive Site: Put van Ekeren, Belgium.
Favourite Dive Abroad: l'Escala, Spain.
Preferred Type of Dive: Both calm and adventurous dives.
Most Spectacular Dive: A night dive in Malta.

DIVING INTO THE GIFT OF CHOICE

FEATURE AND PHOTOGRAPHY **CHAD SINDEN**

Chad Sinden is a PADI Master Scuba Diver Instructor™ and owner of Ocean Fox Dive Centre, a PADI ® Dive Centre in The Bahamas. His journey to becoming a diving professional has been anything but easy, yet despite all odds he continues to choose to dive-in to seek adventure and save the ocean every single day. Here is his story.

Chad Sinden is a PADI Master Scuba Diver Instructor™ and owner of Ocean Fox Dive Centre, a PADI ® Dive Centre in The Bahamas. His journey to becoming a diving professional has been anything but easy, yet despite all odds he continues to choose to dive-in to seek adventure and save the ocean every single day. Here is his story.

"My mission is to inspire others to feel good about themselves regardless of their challenges and to fall in love with the ocean. An ocean full of magic and wonder. If I can inspire just one person with my own challenges and failings, then I have succeeded."

While I have been a PADI Open Water Dive Instructor since 2009, a PADI Master Scuba Diver Trainer since 2019 and the proud new owner of the PADI Dive Centre Ocean Fox Dive Centre, I wasn't born loving the ocean.

I've been lucky enough to introduce a wide range of people to the beautiful underwater world. Regardless of age or ability, my goal is always the same with my diving students – to teach them to love the ocean and encourage them to explore and protect it. I am a firm believer that there truly is nothing more magical than the planet we live on and the contributions you as an individual make to it.

My love for sharks and the underwater world, that I am blessed to explore as a diver, arose from a time in my life where the world held no magic, wonder or mystery above the surface.

In fact, my journey to get to this point has been anything but magical. But my challenges and choices have led me to find sanctity at sea.

LEARNING TO LOVE THE WATER, AND MYSELF

I was born with a rare medical condition called 'Poland Syndrome', which left me without my right-side pectoral muscle or lateral muscle, made my right hand smaller than the left and gave me webbed fingers on my right hand. My medical condition also left me with severe depression, anxiety and a lack of confidence for most of my young adult life.

I also grew up with a fear of water. I nearly drowned three times before I was 16 and didn't learn to actually swim until I was 25. And getting in the water with sharks? No thanks!

At the age of 11 my family moved to Australia. While we were surrounded by the New South Wales oasis of green valleys, I remained scared of the ocean and life there was anything but easy. We were illegal immigrants and were very poor. We first lived in a 30-foot-long caravan before moving into a small house that didn't even have a real toilet. But looking back, I realise this prepared me to deal with less than ideal living conditions in years to come.

When I moved back to the UK as a young adult, I got run over by a drunk driver and was left with severe brain swelling, amnesia and post-traumatic stress that took me three years to recover from.

But my time in hospitals also led to my journey as a PADI Professional. It was at a hospital in Northampton that I did my first PADI Discover Scuba Diving experience. Shortly after I went on to become a PADI Open Water Diver at Stoney Cave near Leicester. My instructor on that course inspired me to start my own journey to become a PADI Open Water Instructor. I had discovered a whole new world beneath the surface and had fallen in love with the ocean.

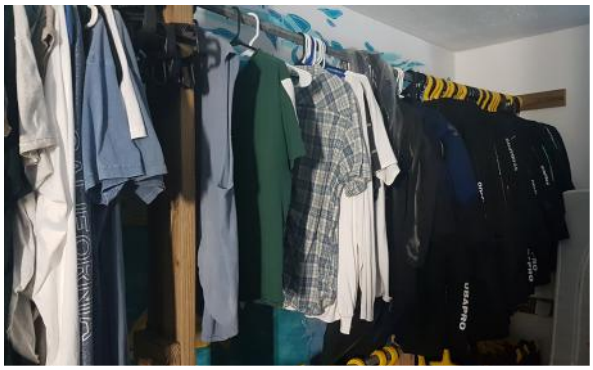
The ocean and all its inhabitants accepted me without question. I found home. I found peace. All the struggles I went through did not define me underwater.

A WORLD OF UNDERWATER ADVENTURE

Soon after diving into a life underwater, I discovered my passion for megafauna.

I remember the first moment a huge shark glided past me and looked me straight in the eyes. At first, I felt completely powerless and all I could do was stare back. But then that transformed into a beautiful moment of mutual curiosity and respect. A moment of connection between two species who realise they don't want to harm each other. It is a moment that I will remember forever and I never felt more alive.

I eventually quit my full-time career as an electromechanical engineer to pursue ocean conservation. This led me to the beautiful Fiji Islands, where I volunteered for four years teaching reef conservation and scuba diving to international volunteers and indigenous locals. I was also there in 2016 when the Category 5 Cyclone Winston devastated the island nation.



But I will never forget the hospitality and kindness that was given to me by people there who lost everything. They taught me a valuable lesson in hope and kindness.

After continuing to work for many dive centres around the world, I found myself in the Bahamas in 2018. I invested my small life savings into 10% of a dive centre on the beautiful island of Eleuthera in the Bahamas. It was the biggest financial risk I had ever taken.

FINDING SHELTER AND HOPE IN A DIVE CENTRE

After two years of working at this dive centre, and for reasons beyond my control, the relationship with the other owner had taken a turn for the worse and I was looking for ways to get out of my partial ownership.

At the same time, the global pandemic upended the dive industry and my livelihood. Tourism was shut down in the Bahamas and we entered one of the strictest lockdowns in the world. From Monday to Friday each week we were not allowed to leave the house, not even for food or medical care. The hospitals were simply over run and the beautiful beaches we were surrounded by were now off limits.

After five months of zero income, a depleted savings account and a maxed-out credit card, I had to give up the small house I was renting and moved into my trusty 22 year old Toyota Rav4. It then dawned on me that the dive centre I used to work at was empty. The company couldn't close or function due to all the facilities that had been shut down.

The wetsuit racks became my wardrobe. The retail floor of the shop became my bedroom. The occasional crab became my roommate while the crickets sang to me all through the night. I lived off generosity of friends, family, and locals. I reminded myself how lucky I was in comparison to those who suffered a worse situation than my own, but I would still cry myself to sleep wondering if I would ever see my family again. I wondered how on earth I would pull through. I hit rock bottom, but reminded myself that I wouldn't go down without a fight, ever.

I began to formulate a plan to borrow money to buy the remaining assets of the dive centre. Since the banks were not lending, I made a list of every person and company I knew of who I had met over my career that could be in a financial position to help me. I created a business plan for the dive centre and pitched it to everyone on the list. I expected zero response, but to my surprise I had three offers within a month! People recognised the importance of continuing shark interaction training and, more importantly, the excellent professional reputation I had attained from years in the industry.

But the hard times weren't quite over yet. I managed to return to the UK after eight months of solitude, only to be put through another four-month lockdown with my family. In total, I had now spent more than 12 months without a single paycheck. But hope in my dive centre kept me going.

DIVING INTO NEW OPPORTUNITIES

I eventually returned to the Bahamas and reopened the dive centre in March this year. Things were slow at first. I found myself having to apologise to guests as they entered the dive shop and saw my bed leaning up against the wall and my clothes next to the wetsuits and a gas cooker in the corner. But my guests were very understanding.

Miraculously, we have had a successful season this year despite all the uncertainty and are looking forward to next year being one of our best years ever!

I've moved out of the dive centre and into a new home. The bills are paid. The dive centre has teamed up with the beautiful Cape Eleuthera Resort and Marina and are looking forward to becoming a PADI 5 Star Resort and Dive Centre very soon.

Since taking over this dive centre, life has been on the up for both myself personally and professionally. After a whole year out of the water, I am now back diving with my favourite animals on the planet – sharks – and teaching others to love these beautiful creatures as well.

From humble beginnings, I am now the proud owner of Ocean Fox Dive Centre in the Bahamas. I am a PADI Master Scuba Diver Instructor who gets to introduce people of all ages and abilities to the magic that lies beneath the surface of the ocean. I get to dive with sharks and be inspired by them every single day. Life is about choices. What choices will you make today?

WWW.EMIRATESDIVING.COM

ENTER DIGITAL ONLINE

EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION 2022

HOW TO TAKE PART

Register for EDA Membership to take part in Digital Online and get the chance to win some amazing prizes. Membership gives you access to all of EDA's annual events and activities.

SUBMISSION DEADLINE

Sunday 17th April 2022 @ 11:59 pm (GST)

DIGITAL ONLINE
جمعية الإمارات للغوص
EMIRATES DIVING ASSOCIATION
PHOTOGRAPHY AND FILM COMPETITION

DIGITAL ONLINE 2022

EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION

SUBMISSIONS OPEN: Sunday, 20th March 2022 | **SUBMISSIONS CLOSE:** Sunday, 17th April 2022 @ 11:59 PM (GST)
DIGITAL ONLINE AWARDS NIGHT & EXHIBITION OPENING: Wednesday, 18th May 2022 | Deep Dive Dubai

THE EVENT

DIGITAL ONLINE
جمعية الإمارات للغوص
EMIRATES DIVING ASSOCIATION
PHOTOGRAPHY AND FILM COMPETITION

AN EVENT BY

EDA
جمعية الإمارات للغوص
Emirates Diving Association

EXHIBITION HOST

DEEP DIVE DUBAI

PRINTING PARTNER

PRINT WORKS

Digital Online 2019's Awards was our last social event since the pandemic and we're looking foward to hosting this year's live event once again now being held at Deep Dive Dubai.

DIGITAL ONLINE'S MAIN OBJECTIVES ARE:

- To develop the human interaction with the underwater environment and highlight the beauty of its flora and fauna.
- To gather information on the number of underwater photographers in the UAE.
- To discover new promising underwater photographers locally and internationally.

Digital Online is open to all photographers and videographers of all skill levels with a valid EDA Membership status. EDA membership must be renewed if expired or acquired in order to take part: www.emiratesdiving.com/membership-form

DIGITAL ONLINE 2009-2022

Digital Online is about to celebrate its 13th Anniversary! The competition was introduced by EDA in 2009 to resident photographers to develop a relationship and human interaction amongst those unfamiliar with the underwater world environment. The competition holds both local and international marine life categories to offer variety between our local and international diving enthusiasts. The film category was introduced as an extension to the competition in 2012 to share our underwater world through motion pictures and deliver a better understanding of the habitats and surroundings.

The event, now going into its 13th year, sees continuous and steady growth of new underwater photographers taking part and joining our regular yearly participants. The enthusiasm and passion strives on, and the drive to bring our underwater world's conservation to the forefront increases over time. The purpose of Digital Online is to keep our underwater world visible by displaying its hidden beauties and to exemplify its importance to all life on Earth through the powers of its ecosystems.

The event has attained equal success with the non-divers who come to support the participating photographers and videographers at the Awards and Exhibition Opening Night. Whether it's through discussion or articles brought to our readers through our free quarterly magazine – Divers for the Environment – the inspiration the event brings, is a success in its own right.

DIGITAL ONLINE
جمعية الإمارات للغوص
EMIRATES DIVING ASSOCIATION
PHOTOGRAPHY AND FILM COMPETITION

COMPETITION CLAUSE

EDA does not disclose photographers' names during the judging process. The competition is run fairly and without prejudice, professionally adhering to all of Digital Online's rules and guidelines throughout.

THE DIGITAL ONLINE RULES AND GUIDELINES 2022

RULES AND GUIDELINES

- Digital Online is open to all photographers and videographers of all skill levels with a valid EDA membership status. EDA membership must be acquired or renewed if expired in order to take part which can be done through the EDA website.
- Each competitor can only win one prize or prize package.
- Winners will choose their own prize.
- Participants are obligated to follow environmental conservation regulations and to respect the underwater world during the process of taking their stills and video. Be advised that any damage to the underwater world, including the disruption of the natural habitat of marine life, provocation through touching, displacing, feeding or annoying, is prohibited and will disqualify the images or the photographer/videographer.
- By entering the competition, entrants declare that they own copyright of the submitted photographs and films and it entails an automatic acceptance of all the rules. EDA reserves the right to publish images in the 'Divers for the Environment' magazine, EDA's social media pages and on the EDA website. Images will also be used in any future promotional material for EDA events and competitions royalty free, but copyright remains with the photographer. Use of images or video will require no additional written or verbal permission from the photographer or videographer.
- Images (photos or videos) must not have already been submitted to previous Digital Online competitions.
- Photos & videos must be taken underwater unless specified in a category description.
- Manipulation is restricted to colour correction, brightness, contrast, sharpening and cropping, except for the Creative Photography category. The Digital Online judges reserve the right to examine untouched images in the other categories if requested.
- Removing backscatter is allowed to an extent, this does not include the removal of subjects such as fish or divers or cutting and pasting sections of images from one to another, except for the Creative Photography category.
- The winners will be announced and their work displayed at the exhibition and award ceremony on May 18th, 2022. Participants who do not make it to the evening of the event will be asked to collect their prize from the EDA offices.
- Sponsors and prizes will be announced in the December 2021 magazine issue.
- We pledge to run this photography and video competition ethically and with integrity. Our judges have volunteered their time to help. The photographers' details remain hidden to the judges during the judging process.
- All judges' decisions are final.

HOW TO ENTER

- Submissions can be entered from Sunday, 20th March 2022.
- The entry deadline is Sunday, 17th April 2022, at 11:59 pm (GST – Gulf Standard Time).
- The participant must be a valid EDA member. Submit entries via email to **photo@emiratesdiving.com** with the requested category detail information.
- File names should include participant's name and the category:
  – Name - Macro.jpg
  – Name - Wide Angle.jpg
  – Name - Best of the UAE.jpg
  – Name - Black & White.jpg
  – Name - Creative Photography.jpg
  – Name - Rising to the Oceans.mp4
- Photo entries must be saved in jpeg format and should be sized between 2000 and 6000 pixels in the longest dimension. Please limit your images to a maximum file size of 5MB. Images will be viewed on a monitor and should be in the Adobe RGB 1998 or sRGB colour space.
- Video submissions must be in mp4 format.
- Photography and video entries are to be sent electronically through WeTransfer.
- You will receive an email to confirm your registration and photo(s)/video upload. If you do not receive one within 24 hours, your email may not have come through and you may need to try again.

Good luck to everyone taking part in Digital Online 2022. Dive safely and have fun!

***NOTE:** HOW PRIZES ARE AWARDED

Once the judging is complete, the winners will be able to choose a prize available to them on the list they will receive via email. Digital Online Judges award a 3-way point system to each photograph/video consisting of Technique, Composition and Impact which is added to give the image or video's total grand score.

Best of show with the highest points will get first choice. 1st place winners by highest score will choose a prize before all other winners, 2nd place winners before 3rd place winners, etc. Please note, each individual can only win one prize or prize package. If photographers get a multiple win, their highest scoring image will win a prize and the other will get a highly commended mention which will also be displayed at the Exhibition.

PHOTOGRAPHY CATEGORIES

Photographers may enter one image per photography category. The categories are open to photos taken with any type of camera: DSLR, mirrorless or compact.

DETAILS TO INCLUDE WITH EACH PHOTO SUBMISSION:

- Photographer Name
- Category
- Location
- Story Behind the Shot
- Camera & Gear
- Settings

1. **MACRO**
   Definition: Photographs taken with close-up equipment, portraying underwater flora and/or fauna. The photographer may not crop the original more than 20%. The original image may be requested.
2. **WIDE ANGLE**
   Definition: Photographs taken with a wide-angle lens (or adapters that provide an equal field-of-view), with or without human presence, portraying the natural beauty of the underwater environment.
3. **BEST OF THE UAE**
   Definition: Any underwater subject taken in the UAE and Musandam.
4. **BLACK & WHITE**
   Definition: Black & white photography is timeless and elegant. Focus on tonal contrast, shapes and textures and the composition of the shot.
5. **CREATIVE UNDERWATER PHOTOGRAPHY**
   Definition: This field is wide open. It can involve a simple workflow used to capture a unique look of a photo. Or it can be a complex post-processing technique that is used to bring out the mood and textures in an image. Photos entered into this category can be taken in any underwater environment – including controlled environments (e.g., pools, tanks). The main subject can be anything ranging from an abstract concept to a person (a diver, freediver, model, etc.) to a fish. There are no post-processing (photoshop) limits in this category. This category is designed to let your imagination swim free.

VIDEO CATEGORY

Videographers may enter one film with the following title:

6. **RISING TO THE OCEANS**
   Definition: Looking for films of all genres – documentaries, narratives, shorts and animation films. Film subject must focus on all aspects of our underwater world including but not limited to, ocean exploration, wildlife, environmental, conservation and oceanography.

- All film genres will be accepted.
- Content must focus or relate to the ocean.
- Non-English films must have subtitles.
- If music is used, it must be from a public domain or royalty-free.
- Film length should be 5 minutes or less, including credits.
- Winning films will be chosen on the basis of creativity and the ability to tell a story that leaves the audience better informed and/or moved about the ocean.

THE SPONSORS AND PRIZES

Digital Online's 2022 Prize Sponsors will be offering this year's 18 winners the *following prizes to choose from:
NOTE: Participants are only able to win one prize each. Entrants with multiple winning entries will be given priority in the points awarded.

1. FREESTYLE DIVERS | www.freestyledivers.me

The Local Hero Conservation Course

5 x 1 hour zoom sessions & 2 days of in water training at Freestyle in Dibba

The Local Hero Conservation Course offers you a unique opportunity to learn all about the ocean environment in your own time. It includes 5 online webinars or downloadable videos that you can access when you have the time available.

Once the 5 modules are complete, you can come to Freestyle Divers and gain some hands-on conservation diving experience as well as context for your newly acquired knowledge. This abridged version of the core course will give you a good foundation to build upon to help you understand how the underwater world works.

TOPICS COVERED:

The Blue Planet: Why are the oceans important and how do they help the whole planet to sustain life? What are the chemical and physical limitations of the oceans and how does this affect marine species?
Marine Ecosystems: A look at how the previously identified physical factors affect distribution of marine life and an examination of the different ecosystems throughout the Earth's oceans.
Marine Biodiversity: An introduction to the range of species found throughout the planet's ocean ecosystems and how the ocean environment drives speciation.
The State of the Reefs: What are the threats posed to the earth's marine ecosystems and particularly the coral reefs throughout the tropical regions? Whether caused naturally or by man, the health of the oceans is declining and we identify and examine the threats in this section.
Marine Conservation: What techniques and actions can be taken to mitigate these threats? Is marine conservation just a drop in the ocean?

FOLLOWED BY 4 DIVES OVER TWO DAYS, COVERING:

Coral Reef Ecosystems: Start learning about coral identification.
Relationships on the Reef: Symbiosis examples; clownfish and anemone, cleaner shrimp and wrasse.
Vertebrates & Invertebrates: 2nd day more advanced fish and invertebrate identification.
Coral Reef Conservation: Coral nurseries, damaged coral, coral diseases & bleaching.

2. GRAND STORES (2 Prizes) | www.grandstores.com

1. Rollei Actioncam 425

- 4K Video Resolution (3840 x 2160 pixels/25fps) – 2.7K Video Resolution (2704x1524 pixels/30fps) – Full HD Video Function (1920 x 1080 pixels, 60/30fps)
- 170° Super Wide Angle Lens – Integrated Wi-Fi with up to 20m range – Simply have access to the camera via App (iOS/Android) from your Smartphone or Tablet PC*
- Incl. 2.4G RF wireless remote control for wireless shootings up to 15m distance, waterproof up to 1m
- Incl. underwater/protective case for depths up to 40m – Battery run time up to 90 minutes (without Wi-Fi)
- Box Contains: Rollei Actioncam 425, 2.4G RF wireless remote control, underwater protective case with 2 exchangeable rear panels (1x for diving, 1x splash protection), rechargeable lithium-ion battery, camera frame holder and adapter, mount basic with 2 component screw, Safety Pad flat with 3M sticker, Safety Pad curved with 3M sticker, quickshoe, tripod mount, USB cable and manual

2. Rollei Actioncam 415

- Wi-Fi Action Camcorder with Full HD Video Resolution 1080p/30fps – Simply have access to the camera via App
- 140° Super Wide Angle Lens – Integrated Wi-Fi with up to 20m range
- Incl. underwater / protective case for depths up to 40m
- Incl. 900 mAh lithium-ion battery – Battery run time up to 90 minutes (without Wi-Fi)
- Rollei Actioncam 415; underwater protective case with 2 exchangeable rear panels (1x for diving, 1x splash protection)

3. XTAR (2 Prizes) | www.xtar.cc

1. D30 1600 Diving Flashlight

The Best Video Light and Focus Light for Underwater Photography

- Maximum 1600 lumens output, four light colours – white, red, blue and UV.
- High CRI, with 7 Cree LEDs – XHP35 for white light, XPE2 for coloured lights.
- 130 degree wide beam angle.
- Multiple lighting modes for colour compensation in UW photography.
- Press switch, easy to operate. Lock function to avoid accidental on/off.
- Two hours runtime for 1600lm, 6.6 hours for 400lm.
- Powered by 1x18650/26650 battery with a LED power indicator showing the battery status.
- Class III Hard Anodized Finish, Aluminum 6063 material.
- Waterproof to underwater 100m.

2. SN4 Camera Battery Charger

7-in-1 Multiple Camera Battery Charger

- Available for Canon, Nikon, and Sony batteries
- Advanced modular docking station
- Charge 4 batteries at the same time
- PD45W adapter, 4 times faster charging
- Special intelligent charging protocol to protect your batteries
- Multiple protection for over-voltage, short-circuit, over-charge etc.
- Plug-and-play connectivity
- Compact size to save space and weight for your outdoor photography
- USB Type-C port for multi-power charging

***Please use the XTAR charging cable and XTAR PD45W adapter only, as the SN4 is high-powered and fast charging.**

4. EDA (2 Prizes) | www.emiratesdiving.com

Scuba up to 30m for Certified Divers in Deep Dive Dubai

Explore the different sections of Deep Dive Dubai's underwater city up to the depths allowed by your certification. All experiences include one of their professional dive guides to show you around and make sure you get the most out of your experience.

5. DIVERS DOWN | www.diversdownuae.com

6 Dives Package to dive the East Coast's dive sites. Includes tank and weights.

6. AL MAHARA DIVING CENTER | www.divemahara.com

2 tank dive trip to Zone 2's shipwreck in Abu Dhabi. Includes equipment, tank and weights.

7. SANDY BEACH DIVE CENTRE | www.divesandybeach.com

Double tank boat dive trip with or without equipment, including tanks and weights.

8. AL BOOM DIVING | www.alboomdiving.com

2 dives on East Coast (Fujairah) with full equipment for 1 person.

*We will update the remainder of the prizes for Digital Online 2022 in the March magazine issue. More to follow!

THE DIGITAL ONLINE JUDGES

STEVE WOODS
Adventure and Wildlife Photographer

Steve is a British adventure and wildlife photographer, based in Vancouver, Canada. His aim is to photograph the natural world to show people how beautiful and awe-inspiring it is as well as trying to highlight the danger we are inflicting on the very ecosystems we revere so much, by photographing and documenting the issues at hand. Steve has worked for many years as a photographer in the UK and abroad, firstly as a newspaper and sport photographer, then moving into commercial, advertising and wildlife/adventure photography. With his passion for the natural world, he uses his skills as a photographer to work in marine conservation.

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DAVID DILEY | SCARLET VIEW MEDIA
Filmmaker, Underwater Cinematographer and Digital Colourist

David is a multi-award winning Film-maker, Underwater Cinematographer and Digital Colourist from the UK best known for his work with sharks and large marine megafauna as well as his multi-award winning feature documentary, "Of Shark and Man".

His profile has increased rapidly thanks to his work on a wide variety of projects for film and television, alongside his commercial work for a number of household brands.

David is the owner of Scarlet View Media, a high end boutique Production House in the north of England, and is a Panasonic Professional Ambassador and Angelbird Media Creative.

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IMRAN AHMAD BIN RAYAT AHMAD | ESCAPEINC
Internationally Published Underwater Photographer

Imran is a photographer and media lecturer based in Singapore with an extensive portfolio. He is highly committed to the education of future generations and in so doing gives presentations and runs workshops on conservation, underwater, travel, sportsphotography&cinematography. Imran is internationally recognised as a Professional Nikon Photographer, a SEACAM Pro Photographer and Ambassador, a Blancpain Ocean Ambassador, Mares, DAN, and DEEPBLU Abasssador, and an Ocean Artist Society Member.

He has been published in countless leading media publications around the world including Nikon Focus, Sport Diver (USA), Tauchen (Germany), Unterwasser (Germany), DAN (Asia Pacific) Scuba Diver Australasia, Scuba Diver, Hello Bali (Indonesia), Asian Diver, EZDive (Hong Kong), Scuba Diving (USA), CEO Magazine (Malaysia), Mediacorp's Slice of Life (Singapore), Straits Times, and Berita Harian, just to name a few. In addition, Imran has 5 of his own published underwater photography books.

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MOHAMED ALMUSALLAMI
Underwater Photographer and Marine Biologist

Mohamed is a son of the Arabian Gulf. Coming from a long line of legendary pearl divers and fishermen, a strong bond ties him to the deep blue. Born in Dubai on a stormy night in November of 1989, he started his passion as a freediver and a spear-fisherman at an early age and naturally fell in love with the beauty of the underwater world. Mohamed started his underwater photography in 2008 which won him several awards and to which he has been published internationally since. His eye-catching and distinctive style is aimed at pushing the limits of how photographers represent life below the waves. Mohamed has dedicated himself to conservation and to the Art of Underwater Photography, putting forth the message, "The Ocean has given our ancestors everything, now it is our turn to give back". As a marine scientist with a masters degree in Environmental Science, he works closely with sea turtles, dugongs, dolphins, sharks and all other exotic species, as well as being responsible for many rare scientific discoveries in the Arabian Gulf region. Mohamed is also a PADI Instructor, a PhD candidate at UAE University, and an affiliate at Mohammed bin Rashid Academy of Scientists (MBRAS).

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SIMONE CAPRODOSSI | SUNDIVE BYRON BAY
Underwater Photographer

Simone is an Italian underwater photographer, who has been awarded in several prestigious competitions and published internationally. After over 10 years of corporate life in Dubai, he recently moved to Australia where he now co-owns and manages Sundive Byron Bay, a PADI 5 Star Dive Centre offering dives at the amazing Julian Rocks in Byron Bay. After travelling to and photographing many unique diving destinations worldwide, he also runs expeditions with Sundive to help others experience and photograph his favourite ones such as the Sardine Run and Djibouti. Simone was the Overall Winner of Digital Online for two consecutive years until he became a judge for the competition and has been a main feature contributor to the EDA magazine, 'Divers for the Environment'.

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ALLY LANDES | EMIRATES DIVING ASSOCIATION
Project Manager, Editor, Graphic Designer, Photographer & Videographer

Ally has worked with EDA since December 2004 when she created and introduced the quarterly magazine, 'Divers for the Environment'. She branded and helped foresee the development of Digital Online – EDA's Underwater Photography and Film Competition from its launch in 2009 and has since managed the event. Ally also coordinates the Dive MENA Expo with the Dubai World Trade Centre Exhibitions and Events Management team for the Dubai International Boat Show.

She keeps busy within her fields of passion, managing the EDA team, developing EDA's brand, running all the events and social media.

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GETTING
INTO UNDERWATER PHOTOGRAPHY

FEATURE & PHOTOGRAPHY **NIKHIL MENON**

This was a journey I thought I would be ridiculed and embarrassed by, and it turns out to have been the most fun learning experience, one of the greatest ways to make new friends, and so much more. The most important lesson I've learnt from everyone is that we are forever learning and with that, constantly improving.

How it started with a GoPro Hero 8 Black.

First off, let me start off with a disclaimer. I by no means consider myself a professional underwater photographer. Nor do I currently have intentions of monetizing my images.

The agenda has purely been to share my experiences with the world, and primarily, the non-diving, land dwellers. I've never been an on-land pro photographer, let alone an underwater one. That being said, here's a quick read through my journey on getting to all of the above "I'm nots", and the immense support and guidance I've received from the UAE diving community.

I married my college sweetheart at the age of 26, and honeymooned in Bali, Indonesia. One of the resorts we stayed at had a PADI 5 star resort located within its premises. Taking this as a good excuse, I took my first underwater breath. This was the first time I saw marine life in its natural habitat and not in an aquarium or on my dinner plate, the first time I felt weightless, the first time I felt freedom like never before, and the first time PADI got a hold of my email address.

The thought of initially getting into the water was an absolute leap of faith, and I had to use every ounce of my willpower to get into it. To add some perspective to my fellow aquaholics, I'd been terrified of water ever since I was a child – after a set of traumatising coached swimming events.

The fear quite quickly turned into complex positive emotions in which I wish I had words to describe them. When we got back to the boat, I just stared into the horizon. I think I cried that day. Not from fear, not from regret, just an overwhelming set of positive emotions. I don't remember much of the time after the dive.

A year or so after we got back from our honeymoon, I had my mind set to getting back into the ocean. This time, not as a tourist, but as a properly certified diver. Well, the rest is history. Within the short span of a year, I had racked up about 100 dives and 5 certifications.

My holidays now revolved around dive sites and my vacation dates relied on the diving seasons. Everything was about diving and marine life preservation. I would constantly speak to my friends and family about diving and the amazing things I see, and sadly, the destruction we unknowingly cause that is so clearly seen underwater. At this stage, my friends and family suggested I use social media to spread my experiences and information of my underwater world and the varied marine life I encounter on my expeditions.

Straying away from the topic for a sec; doesn't going on a dive feel like the closest most of us would get to going into outer space and experiencing alien life?

I've never been active on social media, and had very little I cared to share with the world. But now, there was a goal. An agenda if you will, to bring as many people into my underwater realm as I could. The most visible change I believe is that it's a lot harder if not impossible for people to cause harm to marine life (knowingly or unknowingly) once they see and experience it for themselves. I think it makes people more conscious to their actions or

How it progressed.

inactions, especially when they see how easily coral is damaged, for example. My journey in underwater photography started with this.

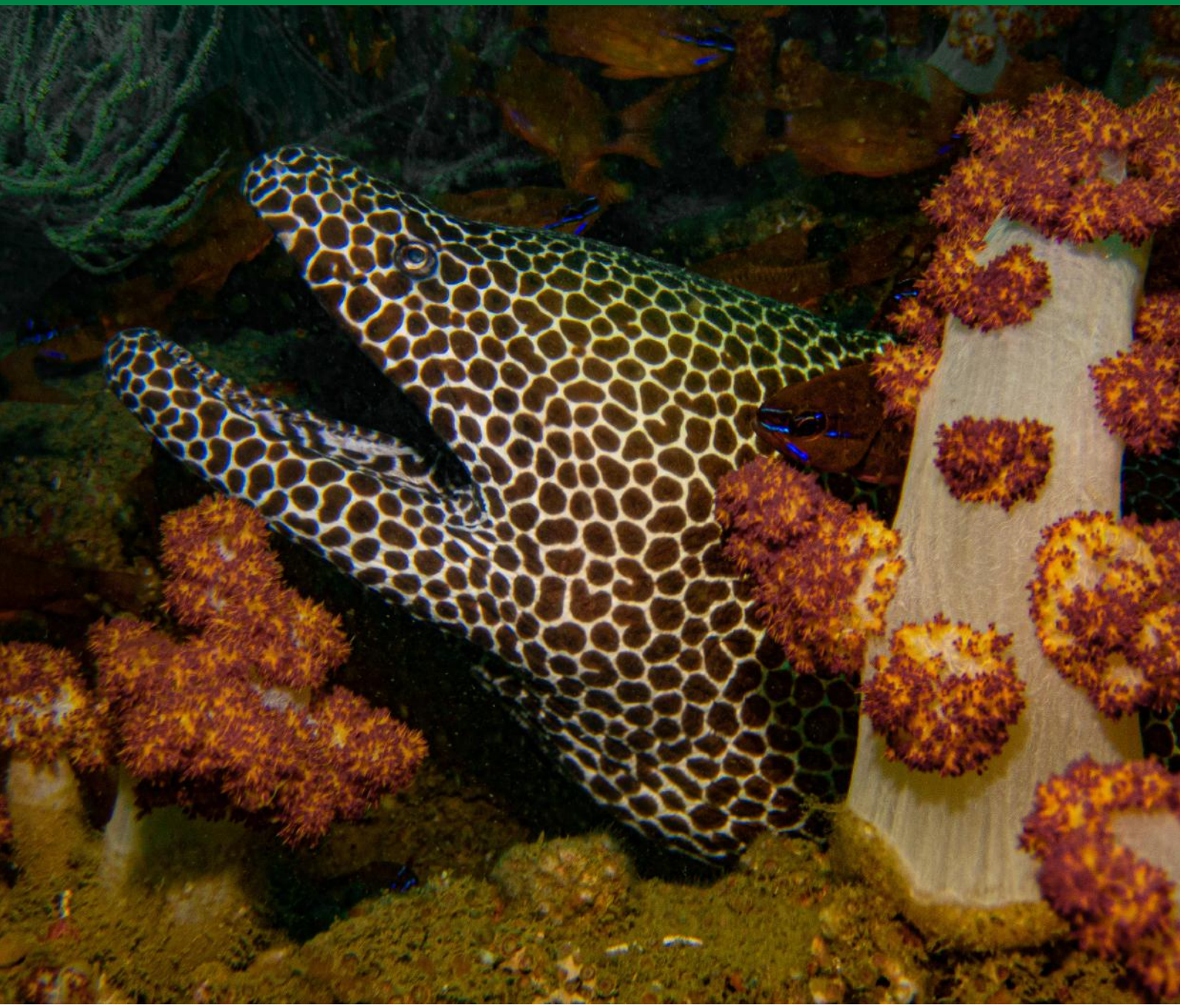
At first, I would ask my dive buddies to share their videos and images with me that they would capture during our dives which I would then compile, edit, add my favourite music to, caption with information (usually fun information), and then post it on social media. The immediate reactions I received within my small group of friends was extremely encouraging. They would ask me about diving, about the marine life in my videos, how they could get into diving themselves, and so on. It looked as if I had landed on the right path.

It wasn't long after, my wife gifted me with my first action/underwater camera; a GoPro Hero 8 Black, with a whole set of attachments. I doubt anyone could ever gift me something as important and life changing as this. To date, this has been the turning point not only in my dive time, but my life on a whole. I started diving more regularly and recorded every one of my dives. I would shoot random shots underwater and post more on social media. These posts quickly got the attention of photographers and videographers (the on-land kinds) who would drop me suggestions and recommendations of how I could make my shots better. Here I was, someone who until very recently didn't exist on social media, now having some extremely kind strangers take the time to write to me along the lines of, "That looks beautiful, try planning your shots maybe, it would look a lot better." And, "Woah, that's amazing. Have you tried using filters?" To be honest though, looking back at those videos and pictures, I can only come to the conclusion that they had been extremely kind in their messages considering the heavy green hues on all my videos and images at the time. Yes, it's the same heavy greens that every diver has at some point come across in their video and image start-ups.

I took all the positive feedback and started planning my shots. The nights before the dive days, I would plan my shots in my head. The opening shot, the pre-dive shots, equipment, the roll back entry, the descent, the marine life, the safety stop, and so on. I would constantly think of the elements I wanted to share with the world. So much so that my wife had brought to my attention that I was speaking about seahorses in my sleep.

Not long after, I started shooting videos, showcasing my entire dive trip, from the drive to get there, to the boat ride back to the shore, and everything in between. Not long after this, I started using interchangeable filters for my GoPro. A set of 3 filters; red, magenta, and light orange that I ordered on Amazon for around AED20 that were my colour saviours in the next phase of my photography and videography.

At this stage, Amazon, AliExpress, and similar sites became a highlight on my credit card bills. I will be the first to admit that in the process of finding the correct setup for myself – influenced by a million different YouTube videos each preaching a different technique or product – I have made a lot of unnecessary purchases, and should anyone want to actually get into underwater photography, it is



How it looks today with an Olympus TG6 set-up.

completely possible to do it within a decent budget. I have not yet found myself regretting an impulsive purchase, as it has taught me something in the process.

I started off with my GoPro on a small yellow float handle, I then got additional filters for it, then I shifted to an extendable handle, added on a hand held video light, and then in its final stage, my GoPro had a stabilizer tray, 2 video lights attached onto the tray, and macro lenses.

Through my experimental stage, I started noticing some of the more advanced photographers on the boat with large camera kits, enough lights to light up the void, camera trays, strobe lights, and what not. It always intrigued me. On one particular day, I happened to be on the same boat as one of the amazing underwater content creators, Khalid Alrazooqi. I approached him sheepishly with my ultra-compact GoPro kit against his very professional looking Olympus kit, and asked him about his set-up and his shots. I even mustered up the courage to show him some of my shots. Without a second's thought, he was as excited as I was and started going through my pictures and videos. He was zooming in and analysing them. At this stage I felt like a 2nd grader showing my stick figure drawings to Pablo Picasso. Khalid was someone I looked up to and followed amongst a few other local underwater photographers. I've always appreciated his work and had not understood how he had got his shots. To my pleasant surprise, Khalid looked up and said something along the lines of, "Amazing, this is how I started out. With a simple GoPro and I got green videos and pictures as well."

This was a turning point for me. That I too could do it. He encouraged me by starting off with techniques he uses, what he looks for, and what he focuses on in a shot. He also went through shot composition, lighting, and white balance.

A few dives later, I found myself on another dive with Khalid and I was this time equipped with an Olympus TG6, and a video light. I would shoot the images, show them to Khalid, and he would give me feedback and guide me through the shots. As well as Khalid, my instructor and friend, Ronald Montina, and my dive buddy, Shankar spent time with me over calls and messages, sometimes hours guiding me through techniques and compositions.

Another underwater content creator who has been a guiding force to me is Hadi El Osta. His shots have also been a source of inspiration and he has helped me out tremendously. He has guided me underwater, shown me how to spot macro species, where to find them and explained their behaviour. Hadi has shared his valuable feedback as well as his tips and techniques on how to better myself.

There have also been all the encouraging dive centres; Barracuda Diving Center and Neptune Diving Center who have always supported me by sharing my content, tagging me, and overall encouraging me to keep going to do better.

EDA's Digital Online Underwater Photography and Film Competition 2020 was also something that helped me create a clearer goal for myself to aim to be one of the top participants. Honestly, I could fill an entire article with the names of those in the UAE's diving community who helped guide, support and encourage me. These are just a few.

I'm still very much learning today, but I've come a long way since my green pictured clips and images. I now dive with an Olympus TG6, 2 18,000 lumen adjustable video lights, a camera tray, and floats, and I work with Adobe Lightroom for my edits. The UAE diving community is an extremely close-knit, caring and encouraging. They have knowingly and unknowingly guided and supported me, and they continue to do so. All I had to do was ask.

Every underwater photographer I meet and dive with has taught me something new. A technique, a style, a camera setting, or how to find something such as where to look for an almost invisible ghost shrimp.

This was a journey I thought I would be ridiculed and embarrassed by, and it turns out to have been the most fun learning experience, one of the greatest ways to make new friends, and so much more. The most important lesson I've learnt from everyone is that we are forever learning and with that, constantly improving. Looking back at my progression and journey into underwater photography, and knowing what I know now, I must continue to follow those examples and continue learning to self improve, and above all, always be humble.

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Shankar: @shansdxb

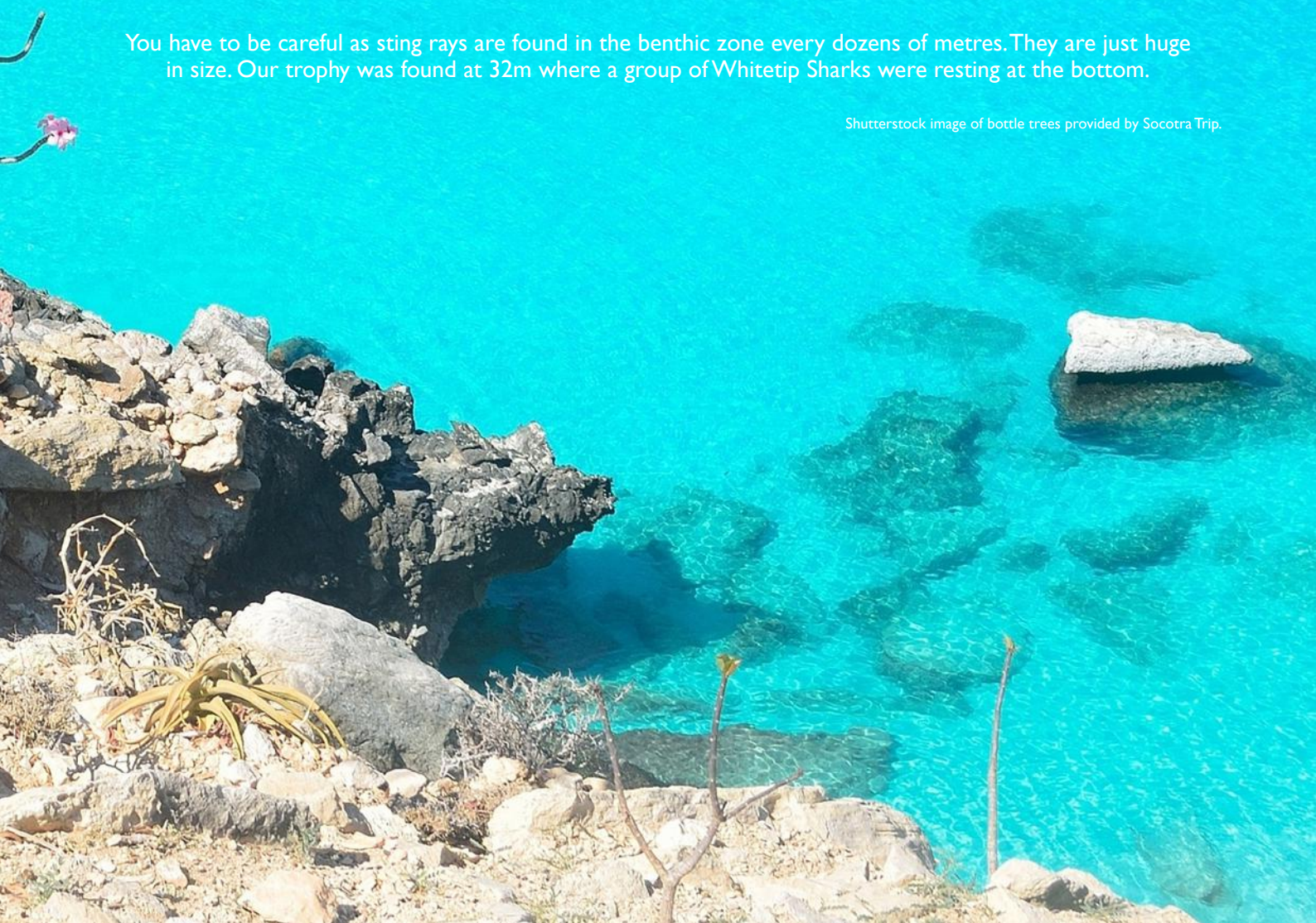
SOCOTRA

THE MOST ALIEN PLACE ON EARTH

FEATURE & PHOTOGRAPHY **AHMED NABIL**

You have to be careful as sting rays are found in the benthic zone every dozens of metres. They are just huge in size. Our trophy was found at 32m where a group of Whitetip Sharks were resting at the bottom.

Shutterstock image of bottle trees provided by Socotra Trip.



When I received an invitation to visit Socotra, my first question was, where is this place located? Socotra is one of the most isolated landforms on earth separated from Africa during the Miocene period and it became a UNESCO World Heritage site in 2008. Its long geological isolation has created a spectacular endemic fauna and flora biodiversity. The unique dragon blood trees, cucumber, bottle and Franksten trees are exclusively found on this island, and it is considered the jewel of the Arabian Sea for good reason.

The island used to be a transit station for pirates in old times. I got very excited about this destination and similarly to Captain Jack Sparrow, I made a decision: Let's go to Tortuga!

The island is reachable 9 months of the year. The autumn season occurs from June, July and August which happens to be the monsoon season during which the island is out of reach both by air and sea. What a wonderful place for pirates!

The adventure starts once you board your flight – there is only one flight per week to Socotra from the UAE, which leaves from Abu Dhabi. Our Spanish guide was with us from start to finish and has become a good friend to everyone in our group.

When you are above the island in your flight preparing to land, you get to witness a bird's-eye view of the mountains and nature of the island which from up above, is absolutely breathtaking.

HOQ CAVE

While my main purpose for visiting the island was to dive, hiking the mountain of Hoq was an experience that cannot be missed. The hike is intermediate and usually takes 90 minutes to complete, but it took me 2 hours to reach our destination. The cave lies at 200m above sea level with magnificent views of the Arabian Sea and the northeast coast of the island. The entrance of the cave is large leading into the tunnel which is around 3km long – to which you are allowed to safely explore about 1.8km. At the end, we came across a fresh water lake.

The mountains that lie in the northeast of the island of Socotra are full of water resources due to the clouds competing with the mountain peaks. This is where I got my first look at the unusual and unique bottle trees.

DI HAMRI MARINE RESERVE

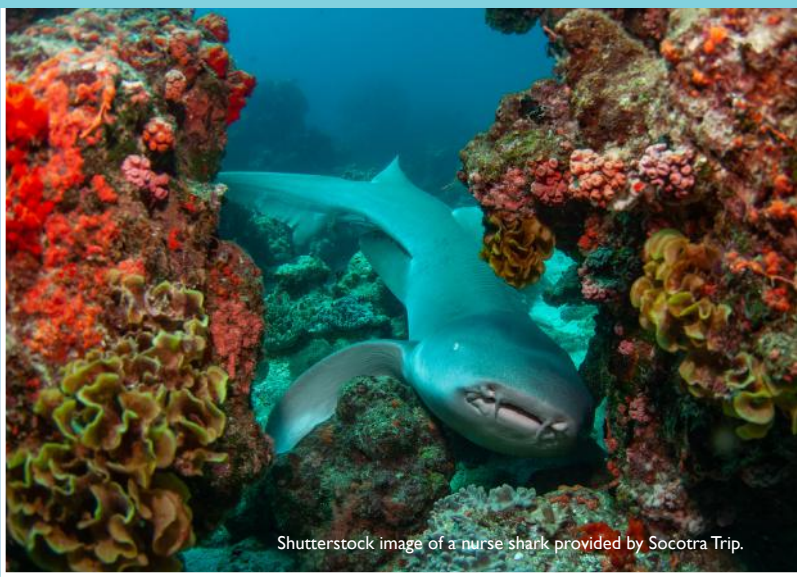
It was an excellent exercise to warm up for the next day's dives at the Di Hamri marine reserve. 'Di' in the local language – Socotran – means 'two'. While 'Hamri' is red, derived from the Arabic word of the colour red, 'Ahmar'. It means the 'Two Reds' which are named after the 2 small red coloured hills in the area.

The dive industry operators on the island are still emerging. There are no speed boats or zodiacs, all the vessels are traditional fishermen boats. Our local guide was a little wild, similar to everything else on the island.

I recommend bringing your own dive gear with you, as I always do. The dive equipment available is limited and there is no guarantee you will find everything in your size. You must have a minimum of 10 dives with an Advanced certification in order to enjoy your underwater adventures in Socotra.

After a short 10 minutes by boat, we reached our first dive site. There is only one way to enter: backroll. The sea water salinity was moderate and the water temperature was 27°C. A 3mm wetsuit or a 1.5mm will give you adequate warmth. This area falls under the

Shutterstock image provided by Socotra Trip.



Shutterstock image of a nurse shark provided by Socotra Trip.

Indian Ocean and Red Sea marine classification. Groupers, Trevally, Surgeon, Parrot, Angel, Box and pufferfish are typically expected. For the megafauna, sting rays, dolphins and sharks are commonly seen. Unfortunately, we missed the Whale Shark that was in pursuit of a school of sardines in the area. The corals were in healthy condition with all keystones species in their right place. It was excellent!

You have to be careful as sting rays are found in the benthic zone every dozens of metres. They are just huge in size. Our trophy was found at 32m where a group of Whitetip Sharks were resting at the bottom. It was thrilling to approach them from the distance to have a better view and shoot some video. As always though, the bubbles from our scuba equipment disturbed them and we watched them peacefully leave, one by one. It was too late to get a close-up!

The dive level is moderate with small surges and no strong currents. When we had surfaced, our fisherman's boat was quiet far away. Divers, please get trained on deploying an SMB and invest in owning one as part of your gear essentials as these are vital in these situations to be clearly seen.

It took a couple of minutes before our boat captain noticed our SMB and steered the boat towards us. As with every zodiac/small boat re-entry, we handed over our weights and equipment to the boat captain before practicing our fitness hauls up onto the boat. One kick, 2 kicks and we were back onboard.

We spent our surface intervals with the fishermen, welcomed by their local hospitality, drinking unlimited cups of tea and enjoyed listening to their stories of fishing and heritage. I can't stop admiring the old days when the fishermen used to explore the oceans with their small boats cut from the trunk of a tree. They fished sharks and large fish geared only with simple tools and strong spirits.

Our second dive was a shore dive with a relaxing dose of adrenaline. We were surprised to find the shore laden with pufferfish. The strong currents and waves had seemingly thrown the weak fish to shore where they lay to die. Diving booties were in this case a must to protect our feet.

BACK ON SHORE

We returned back to shore hungry after a long dive, and it was a pleasure and surprise to find our humble guides had prepared lunch while they had waited for us. We were served the most delicious and flavourful Kingfish with rice in true local style. A dish I will not forget any time soon.

We spent the remaining few days exploring the large area in more detail. Socotra is without a doubt a fantastic experience, leaving me to feel like a pioneer diver in the old days.

FACTS

Area: 3,792km^2
Length: 132km
Width: 50km
Highest Elevation: Haggier Mountains at 1,503m
Capital: Hadibo
Population: 80,000 (an estimate as there is no official data on this)

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MINKE MAGIC
ON THE GREAT BARRIER REEF

FEATURE & PHOTOGRAPHY **SIMONE CAPRODOSSI**

This encounter was everything we had dreamt of. The whales kept coming closer and closer, and moved from person to person giving everyone attention. As the time passed, they became more playful as they got closer, rolling over to show their bellies, moving their heads in and out of the water to see what was happening even at the surface. It is probably the most personal interaction I have ever felt with a marine creature.

In early June this year, before COVID-19 restrictions stopped all movement around Australia, we were lucky enough to be able to travel up to the Great Barrier Reef right in time for what I think is the most special event of the year: the minke whale's migration.

Dwarf Minke Whales travel through the Great Barrier Reef each Australian winter, with most sightings occurring during June and July. The Great Barrier Reef is the only location in the world where it is possible to get in the water with these magnificent creatures.

This trip has been on my bucket list since moving to Australia. We chartered a group of divers from our dive centre, Sundive Byron Bay, aboard the Spoilsport, a fantastic catamaran run by the impeccable crew at Mike Ball's dive expeditions for a 5 days/4 nights trip.

The trip starts from Cairns where the group gets aboard the vessel and travels up the outer Great Barrier Reef spending most of the time at the Ribbon Reefs where most whale sightings occur. At the end, the group disembarks on Lizard Island in the heart of the Great Barrier Reef, and a scenic flight takes you back to Cairns.

The itinerary is dictated by the whales. You will visit areas of high minke activity and dive some stunning dive sites. Since commencing Minke Whale Expeditions in 1996, Mike Ball has had a 98% success rate. The largest pod seen was 28 whales, and the longest encounter was 10 hours.

Dwarf minke whales grow up to eight metres in length and weigh several tons, yet they are indeed "dwarfs" in the giant whale world. Research is continuing to define the exact species of the dwarf minke whale that visits the Great Barrier Reef. There are two known species of minke whales, the North Atlantic minke whale, and the slightly larger Antarctic minke whale. It is thought that the Great Barrier Reef dwarf minke whale is related to the North Atlantic minke, or is an unnamed species.

We went in mid June and the minke season had just started 2 weeks prior with the first trips delivering some encounters but not necessarily extensive interactions, so we were excited but also a little worried to be too early.

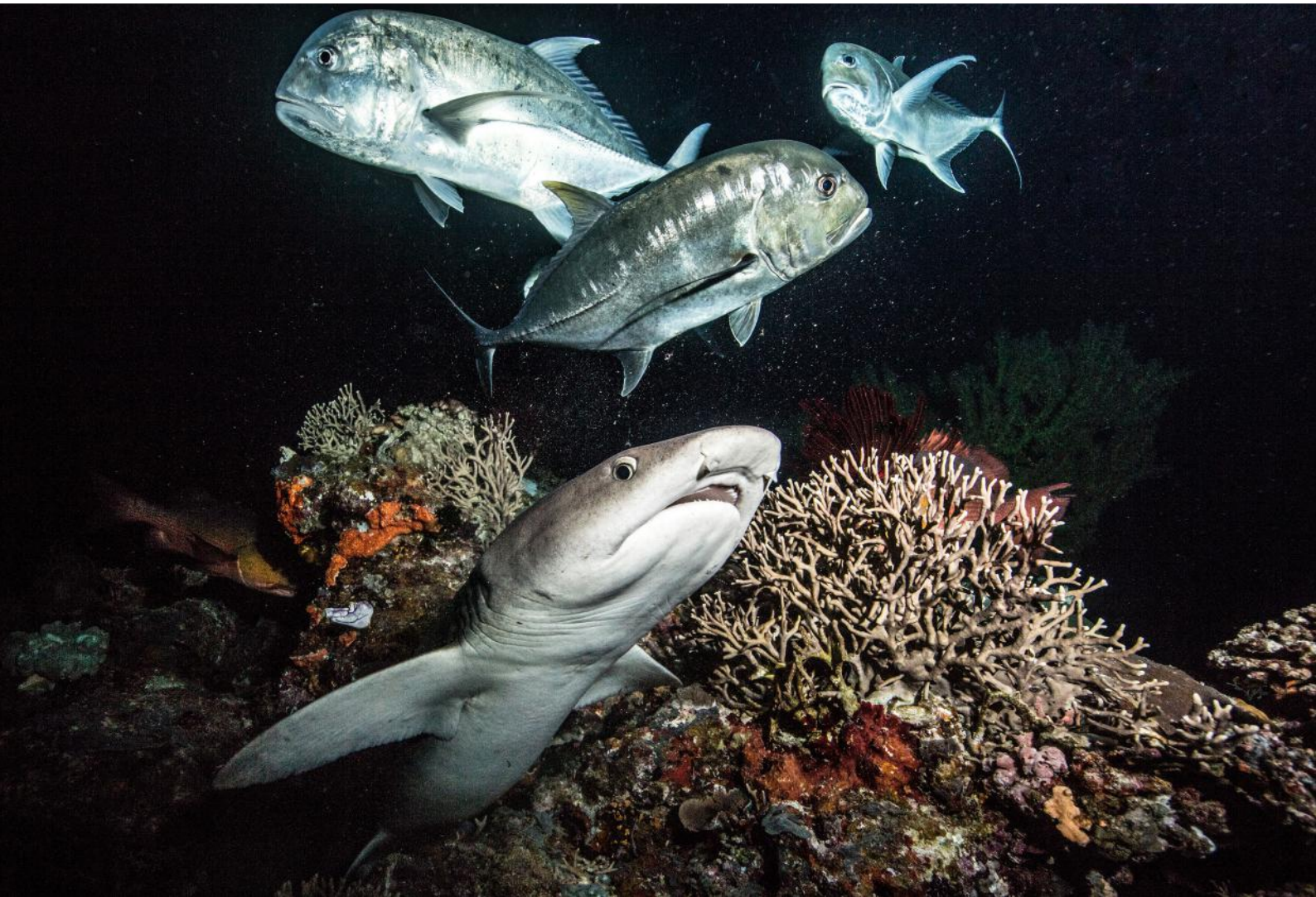
On the first day's travel up along the reef, we had the opportunity for some amazing dives including the famous Steve's Bommie, one of the richest spots of the outer reef with an incredible diversity of coral and reef fish, including the full Nemo cast. We spotted a couple of travelling whales, but none seemed interested in us.

In the evening the team reassured us that the best encounters always happen in the more northern sites and we had the opportunity to learn more about the whales, and how to interact with them.

A researcher from James Cook University is present on every expedition to gather precious data to understand the movements and populations of the whales. He also provides educational information to the guests about the whales and how to follow the strict code of conduct that has been developed over the years to keep the encounters safe and ultimately make the experience pleasant for both the people, and the whales.

The Minke Whale Project has been running for over 25 years. All the photos taken by the guests on the trips can be donated to help build the whale database. In 2013, four minkes were attached with tracking tags to understand where they go after leaving this area of the Great Barrier Reef. A month later, a young male called 'Spot' had travelled almost 3,000km to the continental shelf off of Sydney. The final transmission was received from deep in the Subantarctic.

After a lot of whale talk, we went to bed hopeful and excited to get a chance to finally encounter these special animals.



The next morning we dived the magnificent Lighthouse Bommie, a gorgeous pinnacle raising to the surface from around 30m surrounded by schools of barracudas and plentiful marine life. This was the first spot with high chances of whales but in the early morning we did not seem to have been lucky. After breakfast we finally heard the call of the whales and the lines went in the water for the minke encounters to happen.

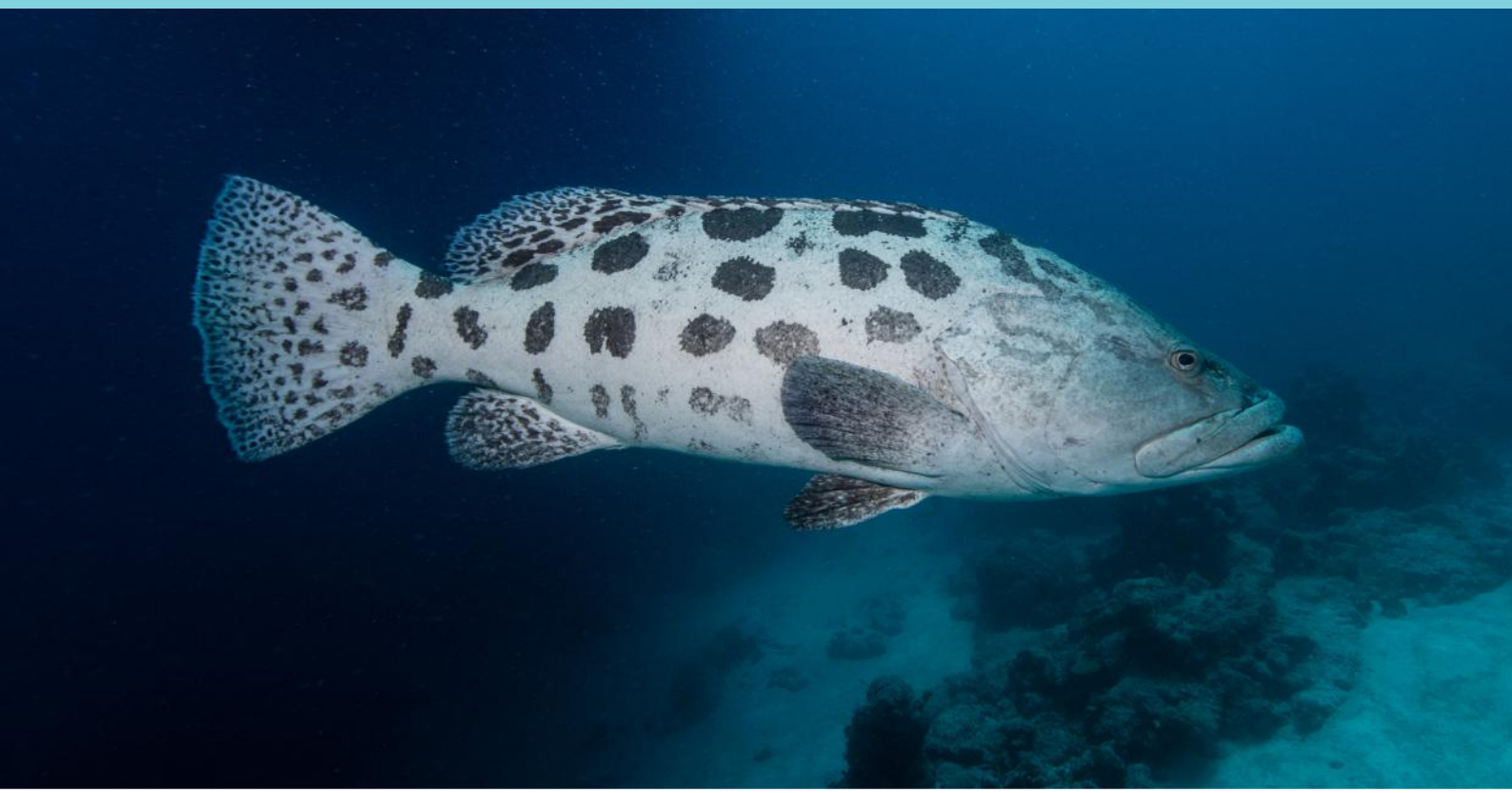
The minke whales are extremely inquisitive and friendly animals so the set-up for the interaction is very different from any other whale encounter. I've had the privilege to snorkel with humpback and blue whales, but to get in the water with them you usually have to intercept their swimming trajectory and jump in the water where you think they will pass. Then it is up to them to engage with you in the water, but it is always you actively positioning yourself in the way of the whale. With the minkes, the story is very different. They actually come to the back of the boats seeking to interact with the funny little humans.

As soon as the first whale is seen hanging at the back of the vessel, the crew lowers two long surface lines attached to the back of the boat and the snorkellers get in the water and position themselves along the lines looking out into the blue. It is only a matter of a few minutes and the curious whales start passing under the snorkellers to then swim out into the blue and come back again, and again.

It is a unique experience to actually be the object of attention of such large marine creatures, and strangely, it feels as if it's the whales who have travelled to see the humans, rather than the other way around.

The minke whales are absolutely beautiful, smooth and elegant with white markings on the pectoral fins, and darker areas along the body creating distinctive patterns that make each one unique. We were all overwhelmed by the joy of sharing the water with these fantastic creatures, but this first interaction only lasted for about 40 minutes with four whales engaging with us, but keeping their distance.

As the whales left, we continued our journey north to enjoy another one of the best dive sites of the Great Barrier Reef: Gotham City. Named after the large number of bat fish that are found in the area, the dive site actually has an extraordinary reef that culminates in probably the biggest coral formation I have ever seen in my life. An enormous bed of Pillar Coral (*Pavona clavus*) stretches from 5 to 30m like a huge mantle thrown on the reef. But it is at night that the main action happens. It's a thrilling night dive where gangs of giant trevally and whitetip sharks hunt through the reef under the divers' lights. Pointing your light on a reef fish for too long is basically a license to kill for the fast predators that snatch their prey in seconds.



We woke up on the third day really hoping to get some more whale encounter opportunities. As the whales were not yet around, we started the morning with a dive at 'Twin Towers', two large pinnacles with an absolutely thriving reef on top of each.

As we enjoyed the morning light effects on the shallow corals, we started hearing the distinctive sounds of the whales echoing through the water. It was time to head back and hopefully get some whale time.

It's unusual to see whales while diving, but we were excited to see the first one coming to meet us on the return from the dive. It seemed they were reminding us that playtime had begun.

We surfaced from the dive to find the lines already in the water, and the snorkellers in the group were with at least 4 whales. We promptly abandoned our dive gear, took the strobes off the cameras and took our place on the line.

This encounter was everything we had dreamt of. The whales kept coming closer and closer, and moved from person to person giving everyone attention. As the time passed, they became more playful as they got closer, rolling over to show their bellies, moving their heads in and out of the water to see what was happening even at the surface. It is probably the most personal interaction I have ever felt with a marine creature. I had to put my camera down several times to look a whale in the eyes to connect as two creatures who both seemed just as excited as the other to be in each other's presence.

We stayed with the whales for over 2 hours but we had to leave for our next scheduled dives. It felt like leaving friends behind at the playground when we were insistently asked to come out of the water – we really had to move on to get to the next dive site, at the famous 'Cod Hole'.

The Cod Hole is famous for it's oversized potato cods that come in for a close interaction with divers. They were historically fed at this site. They are impressively large fish, although still feel small after a whale experience.

After such a mind blowing day with the whales, we were ready to watch the sunset over Lizard Island with our final barbecue night on the top deck. We were all in very high spirits.

On our last morning, we crossed the turquoise waters of Lizard Island to reach the tiny airstrip and embarked on a scenic flight tracing back over our trip, allowing us to see from high above, the impressive extent of the Great Barrier Reef with a few dots that we agreed must have been the whales waving goodbye.

HOW TO IMPROVE YOUR DIVING SAFETY AND PERFORMANCE

FEATURE **MICHAEL MENDUNO**

This September, British human factors expert and technical diver Gareth Lock, hosted the first "Human Factors in Diving Conference," for a global online audience. The virtual conference, which ran for two days, 24-25 September 2021, provided an in-depth look at what the science of human factors is all about, why it is important, and how you can apply it to improve you and your team's diving safety and performance.

Nearly 30 world-class speakers from diving and other high-risk industries such as aviation and health care discussed how they have created positive change, sometimes when faced with significant challenges, and how attendees could be inspired to create change in their own diving and communities. One of the speakers, anesthesiologist and editor of Diving and Hyperbaric Medicine, Dr Simon Mitchell, described human factors as the most important topic today for modern sports diving.

Over the last decade, 50-year old Lock, who is a retired senior officer Navigator from the British Royal Air Force, has been tireless in his efforts to bring aviation's rich body of knowledge of human factors and their impact on safety and performance to the sport diving industry. His company, The Human Diver, offers a variety of in-person and online courses and webinars, in addition to Lock's book, 'Under Pressure,' and the documentary, 'If Only,' about a tragic avoidable accident that took place during a diver training course in 2018. In 2019, he started training an international group of human factors diving instructors, five of whom are qualified now and four more who are almost certified to train divers.

We reached out to Lock to ask him about the conference, how divers can benefit from human factors knowledge, and the various options for attending this unique event. Here is what he had to say.

DAN Europe: Gareth, perhaps you could start by explaining to our readers what are human factors and what do they have to do with diving performance and safety?

Gareth Lock: It's a great question. One of the difficulties about human factors is that it's such a wide topic, and it's generally applicable to many environments. At its highest level, it is how people interact with technology, with other people, and with the environment, along with things such as training manuals, processes, and procedures. The goal is to make it easier to do the right thing, and harder to do the wrong thing.

That sounds "right" to me, especially in diving. One of the things that's come out of the science of human factors, and it is a recognised science, is understanding that our behaviours are massively influenced by the system in which we operate. If you design a piece of dive equipment strictly from an engineering perspective, you know how it is supposed to operate. But if an ordinary user gets a hold of it and consistently makes the same mistakes using the unit, well, that's a human factors issue. The problem is, you have to take into account how a human will actually interact with it.

Similarly, if you're consistently having failures, faults or things keep going wrong with a

training programme, then it's not an individual student's issue with a learning problem, it's a problem with the system. And so, the aviation, healthcare, oil and gas, and nuclear industries, all recognise that we need to design systems with human performance variability in mind, which is really a posh way of saying, we make mistakes.

DAN Europe: That's one of the sobering truths of our humanness, is it not? We make mistakes.

Gareth Lock: Exactly. We are not consistent in how we execute things. If you design a system, be it hardware, a training system, or a process based around optimal conditions, then you are immediately setting people up for failure because there is so much variability in the individual and group performance.

To counter this, we need some form of feedback, be that quality control or quality assurance inside a training system or, once you're outside the training system, an incident reporting system that allows you to capture the details and context of what happened that tells a story of how it made sense for a user or diver to do what they did.

DAN Europe: So we can get into the diver's head to figure out why it made sense to them at the time?

Gareth Lock: Right. I know there are a number of very emotive topics on social media at the moment about diving accidents and fatalities. Critics looking from the outside go, "That is just absolute madness, why would they do that? Let's throw the book at them for being totally negligent." However, that negligent activity doesn't exist in and of itself. It grows and it develops. What we need are systems that allow us to understand that drift (from a norm) is happening. I wrote about this in a recent article in InDepth, "Drift is Normal. Being a Deviant is Normal. Here's Why."

DAN Europe: So when we do make mistakes, we don't die from them? I get it. We need systems designed to prevent and or help catch those mistakes and so minimize their impact?

Gareth Lock: That's right. Here is a great quote from a colleague of mine in the States, a guy called Todd Conklin. He said, "Safety is not just the absence of accidents and incidents. Rather it is the presence of barriers and defences and the capacity of a system to fail safely." The barriers and defences he refers to, in the context of diving, are the training programmes, equipment manufacturers, the CE process, the testing process. We've got to recognise that we're never going to have perfect humans; there's always going to be a possibility of something going wrong.

So, we've got to look at how do people fail safely? That could mean that they still get injured, but they don't die – they don't have a catastrophic failure. The capacity to fail safely could be about teamwork, or having a rescue option, having oxygen, or insurance, or having a hyperbaric chamber nearby.

That means we have to look at both sides of the accident 'event'. There's something that could go wrong – what do we do to reduce the probability of occurrence so that it's as low as possible, but noting that you're never going to get to zero unless you don't dive. We then look at what could happen, i.e., an accident has happened, and consequently, how do we make sure that it's not a catastrophic failure.

DAN Europe: That's a great way to look at it; before and after an incident.

You've told me that the technical training agencies have broadly adopted the concept of human factors, but it seems like there is less awareness in recreational circles. I suspect there are some readers going, "Yeah, human factors. I've heard of that but that's for technical, and commercial and military divers. I'm just a recreational diver. What does it have to do with me?"

Gareth Lock: Brilliant question. Interestingly enough, I've had someone recently think about joining my current 10-week human factors programme and they said, "Well, I'm just a recreational diver." And I said, "Interestingly enough, out of the 22 people in the two morning and evening classes I have running, I would say that 10 of them are recreational divers. Be that a diver, a divemaster or an instructor in the recreational domain."

DAN Europe: They are divers. It's equally applicable, right?

Gareth Lock: That's right, and they're all recognising that there are things that they could do better in terms of their decision-making and understanding how they make the decisions that they do. Communication is a potential critical failure point, because that's how we pass information along. When we are stressed, we make greater assumptions on the part of the other people. We cut down the conversation, and make an assumption that the other person knows what we're talking about. It's a teamwork issue. Who's doing what, when and why, and what happens if something goes wrong on the dive?

Another critical part is the team's psychological safety, the ability to thumb a dive at any time for any reason. That premise is accepted in technical diving circles. But that same premise applies in the recreational diving as well.

That's the key part of a good buddy system – you stay together, and if one person is not happy about it, you both go up.

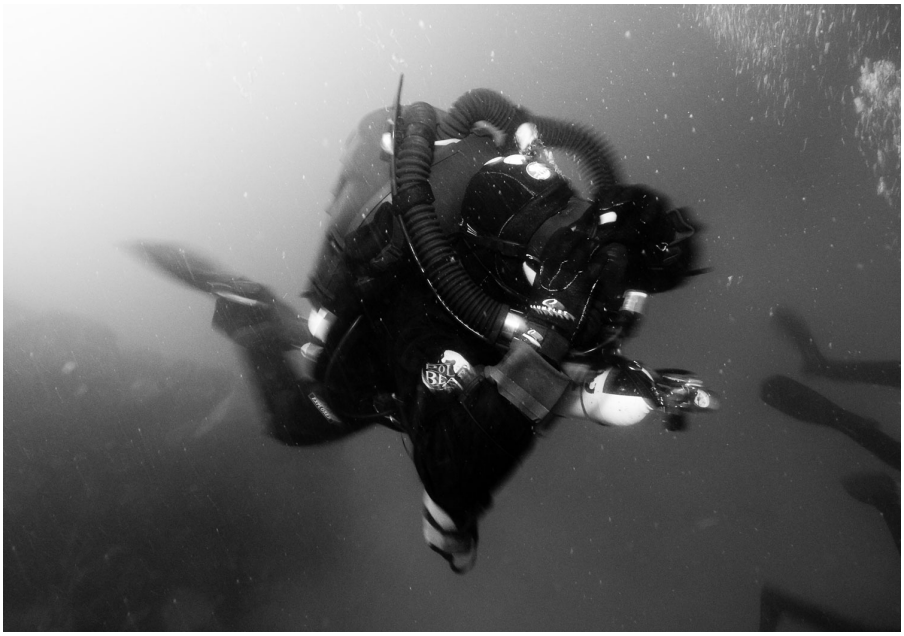
If somebody sticks their thumb up, you don't say, "See you! I'm on my own." Because now you've just eroded a whole bunch of your safety margins that were in place.

DAN Europe: As divers, we need to be able to question what's going on?

Gareth Lock: Yes. We've got to create a culture, a social environment where people can ask those questions and say, "Is this really what we're doing," without feeling stupid or really small in the process. It's up to the leadership, whether it's the instructor, divemaster, dive guide or skipper of the boat, to create the social environment that allows people to ask questions and challenge what is happening.

So, human factors are totally applicable to recreational diving as much as technical diving. Just because they're not doing deep, dangerous diving, it doesn't mean that the risks or the hazards are missing. They're just getting a little bit more severe.

DAN Europe: Right. Humans can't breathe



water, so if you're in 10 metres of water or 100 metres, you are potentially still at risk.

Gareth Lock: Totally. And I would ask the readers this question: Have there ever been times that you wished that you could have ended the dive but you didn't, and then you felt really bad afterwards? Michael, I know from your example in the book, "Under Pressure," that you have experienced that. And that wasn't a technical dive, it was a recreational dive that was going on. I know for a fact, that there are lots of people out there that wish, in hindsight, that they had done something different on their dive.

DAN Europe: Amen to that! Fortunately, I survived to tell the tale and learned something as a result!

Gareth Lock: The whole point of these programmes is to set people up for success so they can make better decisions, and they can communicate more clearly. The idea being that they can develop their own knowledge, so they've got the experience to be able to question or challenge. In effect they're learning from somebody else's mistakes. There's a quote that I put on one of my early marketing posters which said, "It's great to learn from your mistakes, but it's better to learn from somebody else's. Because you can't make all those mistakes yourself."

In fact, that's another one of the biases that limits us when we say, "I'm not like that person, I'm different. I wouldn't make those same mistakes." However, you need to examine why? We're all wired the same way, and so we behave much the same way.

DAN Europe: You've introduced a couple of terms to the diving lexicon; "psychological safety," and "Just Culture." Just culture is what we're talking about, of course. Perhaps you could elaborate on these.

Gareth Lock: Yes, the first term is psychological safety, which is the proactive bit. That's the environment we create that attempts to stop or minimise adverse events or accidents from occurring. We feel included, we feel we can make minor mistakes and learn from them in a positive way. We are able to contribute as part of a team, and ultimately, we can challenge the plan if things are going wrong. That's the proactive side.

The Just Culture component is reactive. It requires psychological safety to be able to talk about this stuff, of course. But if we have had an accident, or made an error, or something went wrong, people will judge us for being incompetent. The idea of a Just Culture is recognising that everybody is fallible and makes mistakes. It's very easy to focus on what went wrong, but that rarely helps us learn. We need to be able to understand how people made the decisions and took the actions they did at the time, so we can learn from them. That's Just Culture.

DAN Europe: So how is the dive community doing in terms of creating psychological safety and Just Culture?

Gareth Lock: To answer your question, we are getting better. If I look back to where we were, say 10 years ago, across social media, things have certainly changed. And the term Just Culture is out there now and people are saying, "Right, let's look at this."

The difficulty is, we see a minor or middling incident where something went wrong, we say, "Yeah, yeah, people are fallible," and we recognise and try to apply a Just Culture. But when something goes seriously wrong, like people are killed and/or there's multiple potential fatalities, then we revert back to the old blame model.

Because as humans, we have a severity bias. The more severe the outcome, the harsher we judge it, and when someone dies, every goes Ah-huh! And if there's a supervisor involved or an instructor – someone in charge – then we immediately point to them and say, "Bang them up in jail, because they are incompetent and negligent."

Well, hang on a minute! Let's look at some of the things that led to the incident. What were the conditions? What organised or arranged behaviours and conditions led to that situation happening? Because you could stop time five seconds before that serious event occurred, and the learning would still be there.

So we don't have a Just Culture yet. We still can't talk about those things, because as soon as people start talking about breaking the rules, bending stuff that's going on for their own gain, then we actually start into the blame game, and "blame is the enemy of safety." That's a quote from Dr Nancy Leveson, who is a professor of Systems Engineering at Massachusetts Institute of Technology (MIT).

DAN Europe: That's a great quote. You offer human factor training through The Human Diver, and now you've launched the first human factors conference in the diving industry. What motivated you to organise a conference?

Gareth Lock: I'm glad you asked. I have done [human factors] training and development work with some friends in the healthcare and the veterinary medicine domain. In January, they launched the first veterinary medicine human factors conference. I sat on my bum for ages thinking about what they had done, and then I realised that I had to do something.

So, I wrote to a number of people from diving and other industries and basically said, 'Look, I know you've got good stories to share about how human factors impacts and influences what you do, and how it could impact divers,

are you interested in sharing that knowledge.'

I actually wrote to about 30 people. My idea was to bring a whole range of diving and different aspects of human factors together. I figured that I had 30 slots for talks over a two-day period. There was a really enthusiastic response.

DAN Europe: You scheduled a fascinating and diverse group of speakers over the two days.

Gareth Lock: I did. No surprise that I got Professor Simon Mitchell from New Zealand to talk about human factors in healthcare and how healthcare can inform the diving industry.

DAN Europe: Dr Mitchell is perfect. He's not only a diving and hyperbaric medicine doc but also a major tech diver and he led an international healthcare study which looked at the efficacy of checklists in the surgical suite.

Gareth Lock: I had the ex-head of safety culture for British Petroleum, a lady called Diane Chadwick-Jones, who was involved in changing the culture within British Petroleum following the Deepwater Horizon disaster. We had an astronaut trainee and ex-commercial airline pilot who talked about what it's like to bridge the gap between diving, aviation and space, and what we can all learn from each other.

I had someone from the Norwegian military, Commander Geir Gundersen, who developed and implemented his crew resource management and human factors training into their military diver programmes.

Then there was Tim Andro from the Northeast Public Safety Divers (PSD) community who did a training course with me, and who wants to look at how we bring human factors into PSD. His talk was about rebuilding a PSD team following a fatality and all the non-technical skills and human factors that went into that.

But it's not just the high-end stuff. We had people, for example, one of my instructors, Helene Pellerin, who is a diver and anesthesiologist based up in Québec City, Montreal. She talked about how we present human factors to novice divers. Mike Mason, who is a military flight instructor in Australia and a divemaster is working to apply Human Diver materials into his job as a divemaster. So, it was basically the full width and depth of human factors in diving; there was literally something for everyone.

DAN Europe: Wow, wow and wow! I think getting a perspective from other high-risk industries on safety and how they are applying human factors to their application is fascinating. Given the state of the global pandemic, you've had to hold this as a virtual conference. How did the event actually work?

Gareth Lock: It was held on a new socially-oriented meeting platform called LexGo. It was recommended by one of my high-risk training colleagues, and it's designed to be a social activity. So, there was no chat window, everything was done through video and microphones. The event was set-up as a conference centre with a lobby and two presentation halls.

Participants could talk and socialise in the lobby. There were also virtual tables in the presentation halls so you could sit next to your friends and colleagues. Your screen had the presentation on the bottom two-thirds, and there were video thumbnails along the top so you could actually talk with colleagues while watching the presentations. There were also a number of tables designated as "quiet tables," where there wasn't any talking allowed. Attendees could also get up and join another table, or leave the presentation hall. There were 30 presentations all together.

All of the presentations were recorded. So, attendees could buy a live-only ticket that gave them complete access to all conference presentations. Then there was a live-plus-recording ticket, where you had access to the event and recordings of all the presentations that could be watched at your leisure.

I am also working with DAN Europe, as you know, to produce a written proceeding of the conference, that will be available for members before the end of the year. All of the speakers will submit a written version of their presentations.

Recordings of the Presentations are available on the Human Factors in Diving Conference: **www.hf-in-diving-conference.com/home**

DAN | AlertDiver

FEELING DOWN – CAN I DIVE?

FEATURE **EMMA BARROW**

Over the past year, we have experienced exceptional changes that have affected all situations in life. Out of our control, the changes have hit us, replacing our routines with a degree of uncertainty, loneliness, lack of visibility into the future, concerns for loved ones, difficulty to cope or anxiety.

An exceptionally stressful everyday life along with the limitations of the ways we relax and take on our hobbies can lead to depression, especially if there are other uncontrollable situations in daily life. In the context of diving, I wanted to study the topic of depression by interviewing diving medical professionals.

Anne Räisänen-Sokolowski from Finland and Marco Di Tomasso from Belgium are divers, diving instructors and also specialised in providing health diagnosis to divers. They both contribute to the diving community by being part of the international medical & research organisation, Divers Alert Network (DAN) Europe.

DEPRESSION IS COMMON

Depression occurs to 20 percent of people at some point in their lives. The COVID-19 period has increased the amount of doctor appointments due to mental reasons, certainly in my home country (Finland) as well as across Europe. Usually, in depression, several typical symptoms occur at the same time, for a long time. The symptoms include prolonged depressed mood, exhaustion and fatigue, sensitivity to irritation, loss of function, inability to perform, and sleep disorders such as drowsiness, waking up in the middle of the night without being able to fall back asleep. At the beginning of the illness, the ability to work and function outside the home (work, hobbies etc) may feel unaffected. On the other hand, in everyday home life depression is quickly reflected in the difficulty of taking care of ordinary things such as laundry, and the disregard for clutter.

DIVING EQUALISES STRESS

According to Marco Di Tomasso of DAN Europe, diving has very positive effects on the human mind. Many divers say that diving seems to reduce stress. Being together with friends, calming down, focusing on one's own breathing and being surrounded by nature are just a few examples of the therapeutic aspects of diving. "According to the World Health Organisation, mental health is a physical, social and mental combination" Di Tomasso describes, and continues, "diving combines all of these. It's a very social sport where the diving community and friends can be almost like your own family. Weekends are spent together and we also travel together. The feeling of togetherness boosts the production of oxytocin, serotonin and dopamine, hormones that promote

pleasure and mental health."

Dr Anne Räisänen-Sokolowski adds that "Exercise and physical activity also support good mental fitness and rehabilitation."

The interview confirms my perception that it is worth taking part in diving events as a surface assistant or just for the joy of being together with friends, even if you are not diving yourself.

WHEN CAN I DIVE THEN?

In diving, safety is maximised with – amongst other things – training, safety instructions and redundancy in equipment. What about a diver's well-being, what does it mean for safety?
An important question for professionals is whether mental illness interferes with diving. Both Di Tomasso and Räisänen-Sokolowski state that there is no general answer to this. The answer depends on the disease, the treatment, and the patient's response to the treatment. However, Räisänen-Sokolowski reminds us, "What used to be an absolute no, is possible today with the development of treatments and medicines. However, certain symptoms and medications, as well as untreated mental illness, are not safe for the diver and it is therefore advisable to consult a doctor, even with mild symptoms." The duration and treatability of depression are improved when help is received early. "The new diver medical questionnaire published by DMSC (Diver Medical Screen Committee) in 2020 comes with instructions for the general doctor to perform a medical examination of the diver, and the instructions can be taken to the medical appointment," she recalls.

Anne Räisänen-Sokolowski states that almost all drugs prescribed for the treatment of mental health affect the central nervous system. They have not been tested outside of normobaric conditions, so the exact interaction between drug use and exposure to depth is not fully known. After a certain partial pressure, all gases also have effects on the central nervous system. "Some medications can be tiring, and combined with nitrogen narcosis, it is not a good combination for a diver. When assessing if a person is fit to dive, the patient's typical dive profile also matters. The stakes are different whether you are diving during a holiday to 20 metres in tropical waters with a light tank on your back, or on a kilometre-long technical cave dive, implying use of heavy equipment or covering the role of a diving instructor."

TAKE AN EASY START

Both health professionals have an important message for divers. Many have had a long break from diving because of the restrictions, so the activity should start calmly. According to Di Tomasso, DAN Europe statistics show that several accidents have been caused by the diver's uncertainty about their own diving condition. "Now it is really important to listen to yourself", they both affirm, as if it came from one mouth. Räisänen-Sokolowski continues, "One should be able to honestly answer to oneself: do I really want to go into the water right now? When making a decision, one should not succumb to the pressure of having promised a friend to dive while perhaps already having driven a long distance to the dive site. Sometimes, children have been ill, work is heavy, it feels good to be out of the house, but one might be too tired and a little scared to go in the water. Then change your dive plans into something easier or don't go at all" reminds Räisänen-Sokolowski.

When it comes to instructors and other people with resposiblilities, both interviewees stress the importance for them to remove all sorts of peer pressure. "If a diver's physical condition is poor, their fear of not managing underwater can be exacerbated. In extereme cases, this can lead to a panic attack." reminds Räisänen-Sokolowski. Those in charge should be sensitive to the signs of a stressed diver and create a relaxed athmosphere for everyone to get into the water. Di Tomasso points out that, "A good way to restore calm is to talk through and visualise the dive ahead. The buddy check is also a calming experience. Have a moment to focus on calming down before getting into the water."

Finally, Di Tomasso suggests, "Enjoy a casual dive while paying special attention to the smallest details and the good around us. Enjoyable experiences strengthen the body's production of pleasure hormones and turn down the production of stress hormones, thus promoting well-being."

ABOUT EMMA BARROW

The very first time I backrolled into water with scuba gear, I knew I was sold! It was in 2015 in the Andaman Sea, Thailand. Since then, I have found my true paradise in the cold and murky waters of Finland. Wreck and cave diving are what works wonders for my soul, and I also enjoy shallow bio dives. I do approximately 100 dives per year, mostly in Finland. As a volunteer, I regularly write articles for the magazine published by the Finnish Diver's Federation.

Follow my journey on Instagram and Facebook.

UPCOMING EVENTS

EDA MOVIE SCREENING

EATING UP EASTER

2 February 2022 | 76 mins | Venue TBC | Online Option Available

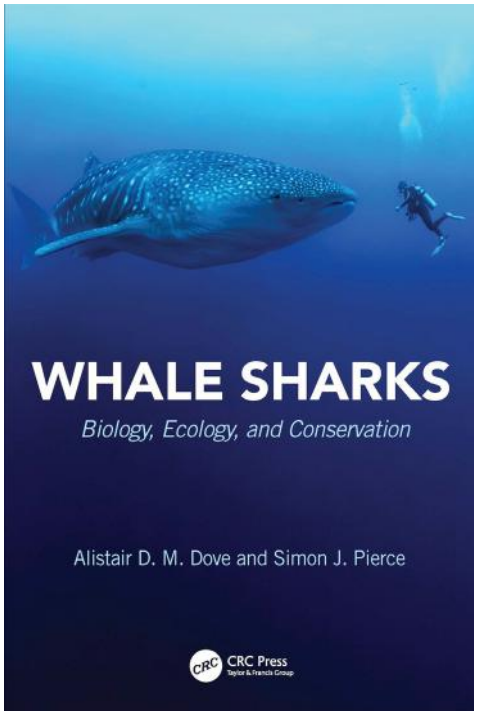
Native Rapanui (Easter Island) filmmaker Sergio Mata'u Rapu narrates to his son the modern dilemma of their people who risk losing everything to the globalising effects of tourism. The film follows four islanders, descendants of the ancient statue builders, who are working to tackle the consequences of their rapidly developing home.

Mama Piru leads recycling efforts to reduce trash, Mahani and Enrique use music to reunite their divided community, and Sergio Mata'u tries to understand the motivations of his father who embraces the advantages of building new businesses. These stories intertwine to reveal the complexities of development and the contradictions within us all as we are faced with hard choices about our planet's future.

DID YOU KNOW?

WHALE SHARKS | BIOLOGY, ECOLOGY, AND CONSERVATION

The first scientific textbook on whale sharks, co-edited by MMF co-founder and Principal Scientist Dr Simon J Pierce, is out now.



Whale sharks, the largest fish that have ever lived, are placid giants that have long captured the interest of scientists and the imagination of the public. This book brings together the world's leading experts on the biology, ecology, and conservation of whale sharks to discuss the lives of these awesome ocean wanderers.

LEARN MORE: www.marinemegafauna.org/whale-shark-book

EDA
جمعية الإمارات للغوص
Emirates Diving Association

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MISSION STATEMENT

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

LEGISLATION

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

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

PUBLISHED BY

Emirates Diving Association
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Dubai, UAE

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