Inspiring People to Care About our Oceans Since 1995

# DIVERS FOR THE ENVIRONMENT

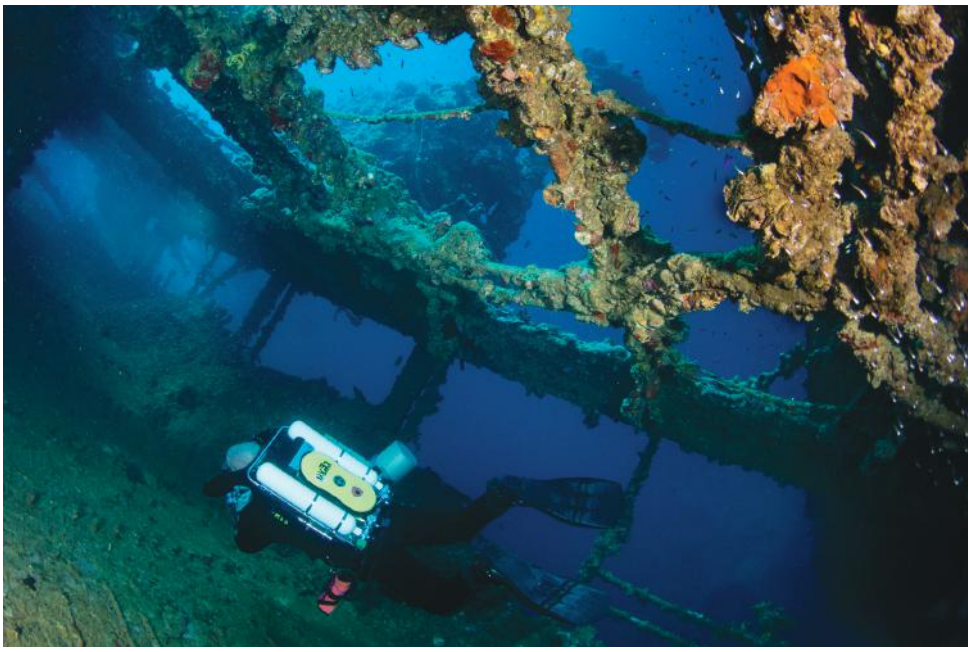
WWW.EMIRATESDIVING.COM | MAGAZINE | MARCH 2016 | VOLUME 12 | ISSUE 1

## INSPIRING PROJECT SHARK SHEPHERD

**DIVE MIDDLE EAST EXHIBITION** • UAE DOLPHIN PROJECT • **ENTER DIGITAL ONLINE 2016** • RESCUING A SEA TURTLE • **SHARKS PART TWO** • MALDIVES • **DIVERS ALERT NETWORK**



Photos by Ally McDowell



EDA
جمعية الإمارات للغوص
Emirates Diving Association

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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. It is hoped that the magazine can become a platform for individuals to voice their opinion on marine and diving related issues. You are welcome to suggest an article for the next issue of "Divers for the Environment" released in June 2016. Send all articles, feedback or comments to: **magazine@emiratesdiving.com**

**EDA COVER**
PHOTO BY BENJAMIN VON WONG


REDUCE REUSE RECYCLE

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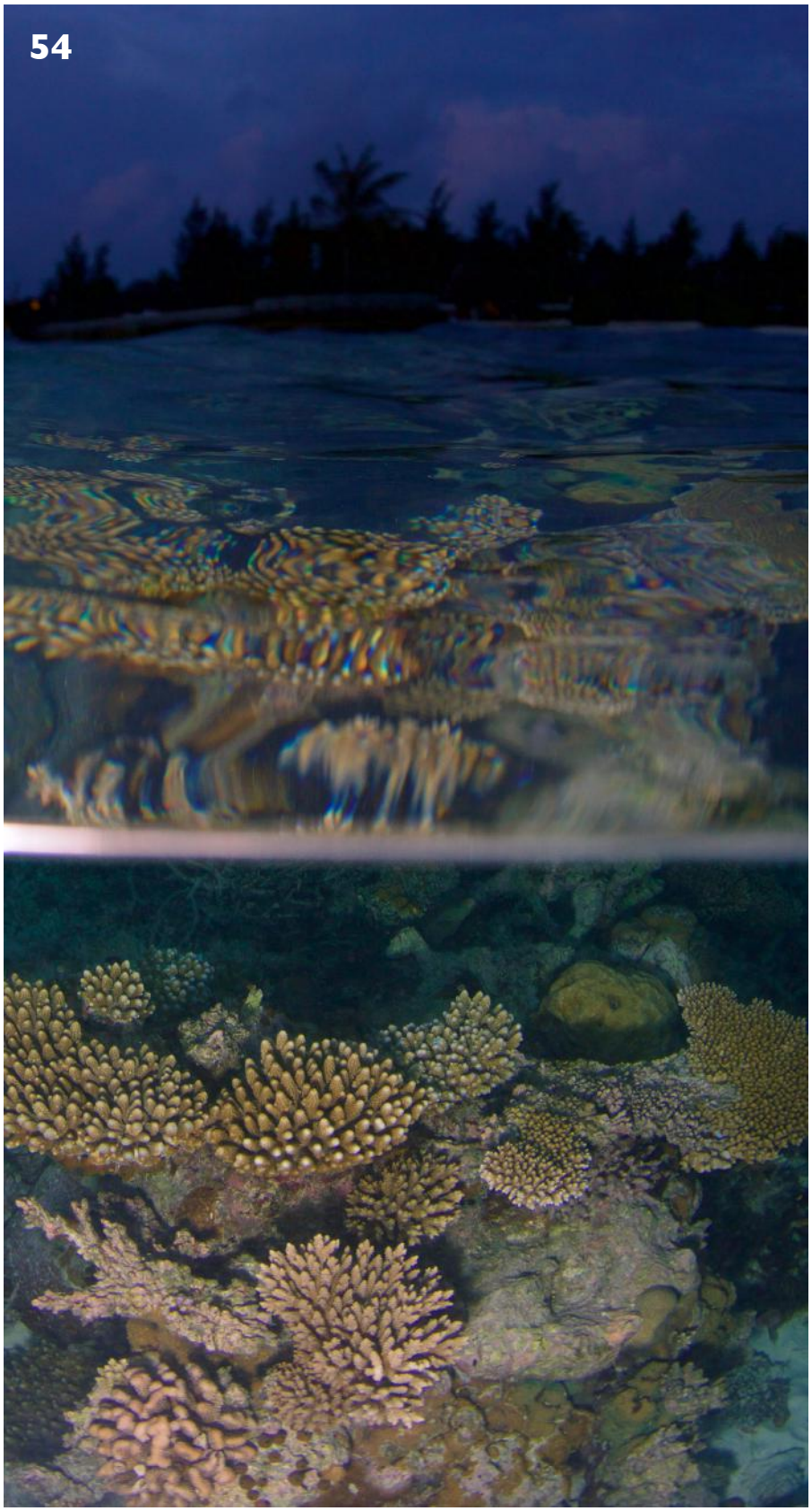



## KIDS CORNER – FONT USED: **DYSLEXIE FONT**

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

### RESEARCH

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

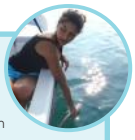
## THE QUARTERLY CONTRIBUTORS

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

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

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

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



**DR. RIMA JABADO**
As the leader and founder of the Gulf Elasmo Project, Rima has been working in the Arabian region to promote conservation of sharks and rays through research and education. She is a member of the IUCN Shark Specialist Group and works with various international organizations to build capacity for the implementation of protection measures. **www.gulfelasmoproject.com**

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

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

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

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

# 21 YEARS HAS GONE A LONG WAY

IBRAHIM N. AL-ZU'BI
EDA Executive Director

I would like to welcome you all to the March issue of "Divers for the Environment". 21 years of marine conservation. Years spent protecting a national treasure so that others may be able to enjoy them. That is what EDA stands for. By giving his blessing to establish this organization in February 1995, the late Sheikh Zayed bin Sultan Al Nahyan, not only placed conservation as a priority for us to uphold but inspired us to bring about change ourselves. I want to take this opportunity to show my appreciation to all our members and staff for the dedication, loyalty and enthusiasm that they've demonstrated throughout this journey. Of course, none of what we have accomplished so far could have been possible without the leadership and visionary thoughts from our board of directors. I'm confident that the next 21 years will hold even more achievements we can be proud of.

As this is our first issue for the year, I would like to take this opportunity to thank our sponsors, we are grateful for the financial support they have given EDA to enable us to continue our mission of conserving and protecting the UAE marine resources. We salute them for being environmentally responsible organizations and we hope that our partnership will last for a long time.

March is the month of DMEX – The Leading Diving Exhibition in the region, where the diving community of the UAE and the region meets alongside the Dubai International Boat show to discuss diving updates and share the latest dive gear in the industry. I have been asked in an interview prior to DMEX about the future of the diving industry in the UAE and will this sport still be booming in the region. My answer was clear; diving is a passion and the sport of diving and the diving industry in the UAE and the region will continue to grow, not only because the people of the UAE are the people of the sea, but also because of the amazing infra-structure that we have in this country and the long term development goals that the government has in place for the UAE as an international tourism destination. DMEX is the biggest so far this year and it is getting so popular that we managed to sell the whole exhibition space in a short time. We also noticed the increase in EDA memberships and dive centers, in addition to more than 3,000 Facebook fans.

I am looking forward to this year's Digital Online – EDA's Underwater Photography and Film Competition with lots of underwater photography gurus participating and sending EDA amazing photos and videos of the varied marine life from all the places our members have dived. I want to thank the members of the jury and wish them luck in their tough job judging amazing underwater photos from our members and I am looking forward to the awards ceremony in May.

You will also find in this issue, exclusive news and special offers for our members from our dive centers and clubs in the UAE. The diving industry is in for a busy 2016!

As you all know, EDA is an official Training Reef Check Facility in the UAE. We have allocated a lot of space for Reef Check News in this issue, with updates from Reef Check's Headquarters.

I also want to take this opportunity to thank our EDA members who continuously share their insightful diving experiences and underwater pictures with us. Your insights and articles are imperative in recommending when and where to go diving as well as what to look out for on trips.

We hope your passion and enthusiasm continues and you will continue to send us news about your next diving adventures, and we look forward to seeing your next batch of underwater world snaps!

I do hope you enjoy reading this issue of "Divers for the Environment". We have a busy year full of activities and events waiting for you. The EDA team is working tirelessly to make it another successful year and we're looking forward to seeing you all at the upcoming EDA events. Stay tuned!

Happy reading and DIVE SAFE!

Ibrahim Al-Zu'bi

Ibrahim N. Al-Zu'bi

# DIVE MIDDLE EAST EXHIBITION
## DMEX 2016 COMMEMORATES 10th YEAR

### THE DIVE MIDDLE EAST EXHIBITION

Whether you're a casual or seasoned diver, immerse yourself in a world of underwater adventure during the 10th Dive Middle East Exhibition, the only international event in the Middle East. Supported by the Emirates Diving Association (EDA), discover state-of-the-art diving gear and equipment, alongside a series of professionally delivered practical and interactive activities in our on-site demonstration pool, designed for divers of all levels.

DMEX
DIVE MIDDLE EAST EXHIBITION

**1-5 March 2016 | Open 15:00 - 21:30**
**Dubai International Marine Club, Mina Seyahi**

### THE VENUE – DIMC

Founded in 1988, the Dubai International Marine Club is one of the most established marina and watersports clubs in the region and has become the diving force behind the growth of national and international water sport events in the Middle East. Located on Dubai's rapidly developing waterfront, next to the Le Meridien – Mina Seyahi and the iconic Palm Jumeirah, DIMC is the ideal venue partner for the Dubai International Boat Show.

**TOURISM MALAYSIA**
**STAND NO:** D-44

Malaysia Truly Asia

Our Mission: Marketing Malaysia as a destination of excellence and to make the tourism industry a major contributor to the socio-economic development of the nation.

Our Objectives

- Promote Malaysia as an outstanding tourist destination.
- Showcase Malaysia's unique wonders, attractions and cultures.
- Enhance Malaysia's share market for meetings, incentives, conventions and exhibitions (MICE).
- Increase Malaysia's tourism revenue by increasing tourist numbers to Malaysia and extend their length of stay.
- Encourage tourism and its related industries in Malaysia.
- Help develop domestic tourism and promote new investments in the country, as well as provide increased employment opportunities.The growth of tourism would also contribute positively to the country's economic development and quality of life.

Our History: The Tourist Development Corporation of Malaysia (TDC) was established on 10 August 1972 as an agency under the former Ministry of Trade and Industry by an Act of Parliament.

With the inception of the Ministry of Culture, Arts and Tourism on 20 May 1987, TDC was moved to this new ministry; and became the Malaysia Tourism Promotion Board (MTPB) through the Malaysia Tourism Promotion Board Act 1992. Popularly known as Tourism Malaysia, its full focus is on promoting Malaysia domestically and internationally.

**AL BOOM DIVING**
**STAND NO:** D-85

Al Boom Diving

For those of you thinking about taking the plunge and finding out more about our daily diving and snorkeling trips and PADI Dive Courses, look no further than DMEX – D-85, where our multi-lingual team of PADI Dive Instructors will be eagerly waiting to answer your questions. Al Boom Diving is the leading diving and watersports specialist in the G.C.C. We operate dedicated dive centres in some of the most renowned and prestigious resorts, including Le Royal Méridien, Sofitel, The One & Only and Le Méridien Al Aqah Beach Resort, which offer unrivalled diving and snorkeling in the region. We also have a diving operation in the spectacular Dubai Aquarium and Underwater Zoo.

Al Boom's popular DMEX Dive Shop will be bursting with an array of our latest and greatest products from world-class brands including Aqua Lung. This year we will be launching two very exciting new products: The Aqua Lung Instrumentation line and the Aqua Lung Legend LX 70 regulator. The Aqua Lung Instrumentation line is a new venture for Aqua Lung, who have revolutionised Dive Computers and Analogue Instruments, which deliver on their promise of, 'Complex Made Easy'. The Aqua Lung Legend LX 70 regulator is a special 70th anniversary edition. These are very rare. Only 770 pieces were made globally. We have just four to sell. There is an enticing anniversary competition to celebrate the launch, where seven lucky winners will win a trip to the French Riviera. We will also be showcasing the brand new Michael Phelps race wear range for the first time in the Middle East.

**DEEP BLUE SEA DIVING CENTRE**
**STAND NO:** D-115

DEEP BLUE SEA DIVING

Deep Blue Sea Diving Centre is one of the leading dive centres in the UAE, established since 2004 and the 1st dive centre to be approved by DMC, Dubai Marine City Authority. Deep Blue Sea Diving Centre offers a range of courses from beginners to instructors & First Aid Courses. Our Diving Centre offers a full range of facilities including dive shop, classrooms, equipment rentals and a booking office. We also offer the full face mask with communication for non-certified divers.

Deep Blue Sea Diving Centre holds the exclusive dealership for Seabreacher, X-Jetblade, X-Jetpack, Jetovator, Shred Sled, Freedom Flyer, SUUNTO, OTS (Ocean Technology System) & Mares equipment in United Arab of Emirates. We are the regional representative for IDEA Middle East and also authorized to issue diving certificates by various global diving organizations such as PADI, CMAS & SSI.

We work closely with various corporate clients, providing recreational and professional diving training and one of the only dive centres that offers specialized and niche hydro sports activities.

Our team has been carefully selected, are well experienced, qualified from the U.S., bilingual and are able to cater to many nationalities.

**EMIRATES DIVING ASSOCIATION**
**STAND NO:** D-62

EDA
جمعية الإمارات للغوص
Emirates Diving Association

Inspiring People to Care About our Oceans Since 1995!

EDA is a non-profit voluntary federal organization and is accredited by UNEP as an International Environmental Organization. Our mission is to conserve, protect and restore the UAE marine resources by understanding and promoting the marine environment and promote environmental diving. Divers can prove extremely utile in conserving the marine environment through observing, reporting and preventing environmental abuse.

Come on over to say hello to the EDA team and collect a copy of EDA's March magazine issue, 'Divers for the Environment'.

For more information about EDA, go to **www.emiratesdiving.com**

**AEROTECNICA COLTRI**
**STAND NO:** D-80

COLTRI COMPRESSORS
MADE IN ITALY

Coltri Compressors are manufactured at our headquarters in Italy.

The Coltri family has been producing high pressure compressors and scuba diving equipment since 1954 when Carlo Coltri and his father, Giuseppe, first constructed a high pressure compressor to enable him to fill his own scuba tank and dive in Lake Garda.

Aerotecnica Coltri S.p.A was established in 1982. The company designs and produces high pressure compressors for breathing air and technical gases.

Low and high pressure compressors for:
- Pure Beathing Air
- Natural Gas (Methane)
- Nitrox ($O_2$ Enriched Air)
- Industrial Air
- Technical Gases (Nitrogen, Helium)
- Paintball and Air Guns

**www.aerotecnicacoltri.it**

**AQABA TOURISM**
**STAND NO:** D-34

aqaba
RED SEA WADI RUM·PETRA
Jordan

Discover the M40 tank and Cedar Pride ship wreck which is one of the top 10 in the world. Explore the coral reefs of the Red Sea, home to hundreds of different types of corals and sponges with hundreds of brilliantly colored fish.

Experience a fusion of history, nature, and city life surrounded by picturesque mountains

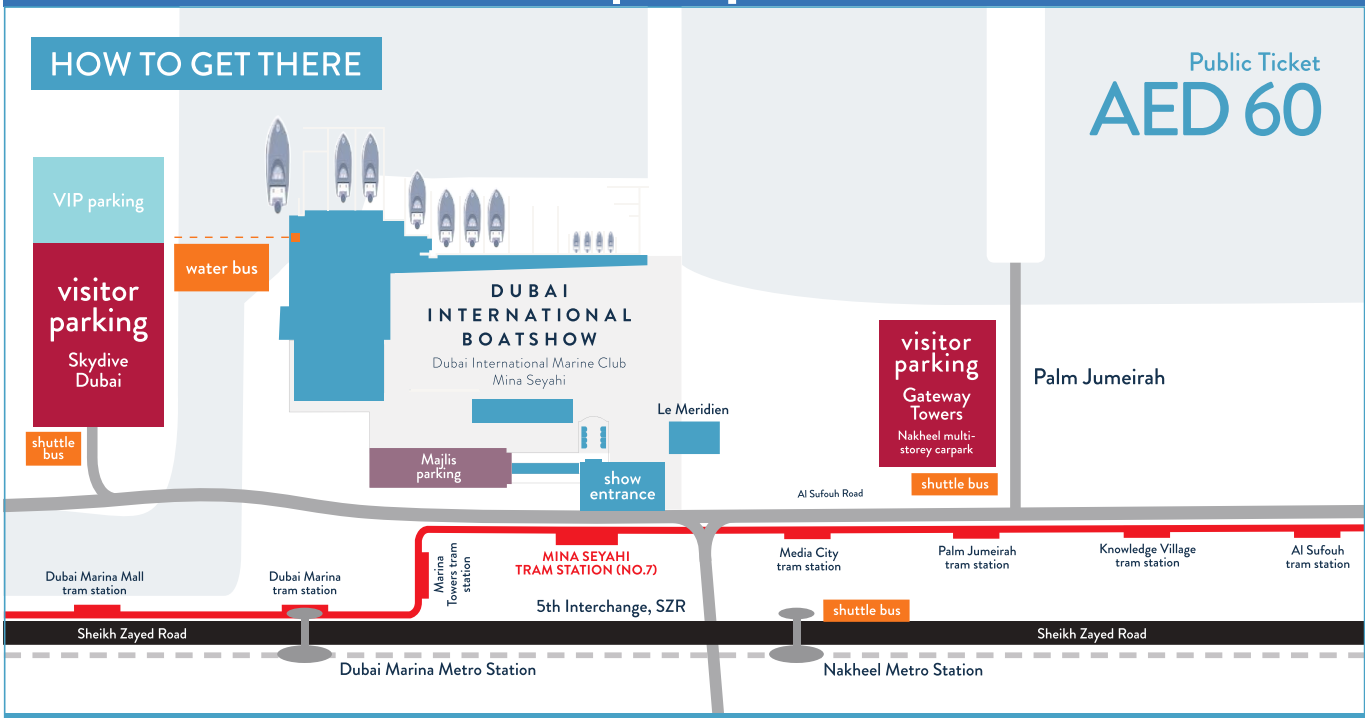
Visit the striking desert landscape of Wadi Rum; a UNESCO World Heritage site which offers a unique combination of desert wildlife, archaeological riches and the authentic Bedouin culture.

Live the Nabatean experience at the city of Petra, one of the World's Seven Wonders.

# 1-5 March 2016 | Open 15:00 - 21:30

## HOW TO GET THERE

Public Ticket
AED 60




- **Free shuttle bus** - Skydive Dubai , Gateway Towers and Nakheel Metro Station
- **Free water bus** - Skydive Dubai
- **Dubai Tram** - Disembark at Mina Seyahi Tram Station for show entrance

**THE PAVILION DIVE CENTRE**
**STAND NO:** D-40

The Pavilion Dive Centre is a PADI 5 Star CDC Centre. The Pavilion Dive Centre is located in the luxurious grounds of the award-winning Jumeirah Beach Hotel. As the only PADI Career Development Centre in the Middle East, Pavilion attracts diving professionals from near and far to gain quality professional development and a start in the diving industry. PADI Divemaster, Instructor Development (IDC), Instructor Specialty, IDC Staff Courses, EFR Instructor Courses and Instructor Examinations take place in our facilities at several times of the year on fixed schedules.

Besides PADI professional Development, our multilingual team of skilled PADI Instructors conduct the entire range of PADI Recreational Diving Courses for the young and old. The Pavilion Dive Centre also offers daily dive excursions to certified divers on both East and West coasts of the UAE and has a large selection of SCUBAPRO diving equipment along with PDC branded diving apparel.

**PREMIERS FOR EQUIPMENT**
**STAND NO:** D-10, D-70

A 100% local establishment based in Abu Dhabi, in the UAE. Founded in 2001 to be sole agents dealing with Government Authorities, Municipalities, Oilfield Companies, Divers & Diving Centers.

We are committed to provide a first class service to complement our quality products, and to offer our clients strong, local support along with the latest technology in the field of diving. Our main aim is to make diving easier and more enjoyable to discover the pleasures of the underwater world by offering you a complete range of reliable, top quality gear.

We are the dealer for Oceanic, OceanPro and Hollis-USA for sports, recreational & technical diving, Ocean Reef-Italy for full face masks & underwater telecommunications, Explorer Case for durable waterproof cases, Picasso-Portugal for spearfishing and Tovatec for diving torches, Lavacor-USA and TeknoDiver-Italy for thermal protection & custom-made wetsuits.

**UNIFIED TEAM DIVING**
**STAND NO:** D-28

Unified Team Diving is a global leader in scuba diving training and equipment manufacturing and a global community for like-minded divers. As a world-wide, high quality, fast growing dive training agency and online community, UTD is the only scuba education system that has created an in-house equipment brand and the only global scuba diving agency with a 100% worldwide safety record.

Aquateam is an online technical and advanced recreational equipment company, supplying the Middle East with everything from advanced technical fins through masks, backplate and wings, sidemount equipment, lamps, scooters as well as all those essential accessories required for DIR diving. We are the Middle East distributors for UTD, DTD and Suex.

**FILPESCA ITALIA**
**STAND NO:** D-95

Filpesca Italia is one of the leading brand names based in Southern Italy. They were established in 1989 as a wholesale company for professional sports fishing equipment.

With the initiative, agility and freshness of a young company, they are ready to hit the international markets and introduce their exceptional artisanal production line.

**DUBAI CREEK MARINA**
**STAND NO:** D-92

Situated along the banks of the Dubai creek. The Dubai Creek Marina offers protected moorings for vessels from 25 to 165ft. Facilities include a well stocked Chandlery, Fuel station, Charter and the region's best pleasure boat repair facility with a 50 ton travel lift. With connections to many top international boat manufacturers and dealers, we offer the very best warranty and service support available.

Freestyle is a UTD and PADI diving facility offering high quality, team oriented technical and recreational training, boat dives, technical gas fills and equipment rental on both UAE coasts. We provide a warm and friendly atmosphere where fun, quality and safety are at the core of everything we do. We operate an Ocean Friendly policy and organise regular expeditions for our dive teams. Finding, exploring and documenting wrecks is a particular focus for us and we regularly organise specific training and trips to share our passion for this exciting part of our marine heritage.

# 1-5 March 2016 | Open 15:00 - 21:30
## Dubai International Marine Club, Mina Seyahi

## BLUE FORCE DIVING
**STAND NO:** D-38

Blue Force Diving offers dive boat liveaboard trips in the Maldives and Egypt. 20 years of experience endorses us to guarantee our customers the highest quality service at the best price.

MALDIVES: 2 dive boat liveaboards with guaranteed weekly departures. We have the luxurious Maldives Blue Force One (Awarded by the Maldives Liveaboard Association as Best Built Livaboard 2014), a genuine 5-star cruise. Moreover, we provide our customers with the most expert and experienced guide team in the Maldives. True pioneers in the far Southern Hemisphere routes.
**www.maldivesblueforce.com**

THE RED SEA: 3 boats with complete dive boat liveaboard amenities and weekly departures are guaranteed. Find out about our schedules from Sharm El Sheikh, Hurghada and Marsa Ghaleb. We are specialists and highly experienced professionals in Wreck and Tek Cruises (trimix, rebreather, scooter, etc.).
**www.redseablueforce.com**

We provide the best hotel/daily dive packages in Sharm El Sheikh and Nuweiba, with optional tours in Cairo, and cruises on the Nile and Petra.

## PADI
**STAND NO:** D-110

PADI® the world's largest recreational scuba diver training organisation celebrates its 50th Anniversary in 2016!

Since its inception in 1966, PADI has issued more than 23 million certifications worldwide. With over 135,000 Professional Members and 6,200+ PADI Retailers and Resorts operating in over 180 countries, PADI truly is The Way the World Learns to Dive®. As the trusted authority for scuba training and education, PADI's Professional Members and Divers are passionate about diving and conservation of the aquatic environment.

Not been diving for a while? Come to the PADI stand and ReActivate®. Need information on the move? Download the awesome PADI App. Looking for your next PADI adventure? Let us help you decide where to go. Book a PADI course at DMEX 2016 and receive a Free PADI gift.

PADI Europe, Middle East and Africa
**Email:** customerservices.emea@padi.com
**www.padi.com**

## DAY & NIGHT DUBAI
**STAND NO:** D-60

We are a family-run company and aim to offer a professional, friendly and flexible service. Our wide selection of superb yachts offers a unique variety of sizes and designs. Our yachts are all privately owned and therefore each is unique with its own character.

We offer private yacht charters with a range of water sports facilities such as Flyboard, X-Jetpack, Jet Ski, Banana Boat, Thriller Ride and Try Scuba Diving. Our customers say the level of service we offer to both charterers and owners is the best in the business, as can be seen from our testimonials. This is reflected in the high level of repeat bookings and our continuing successful growth.

Our company certified from SME department in Dubai.

Our yachts are based at Jumeirah 5 Umm Suquim beside Burj Al Arab and at Dubai Marina Walk beside Marina Mall. We can easily monitor and carry out the maintenance, cleaning and preparation of the yachts to our own high standards. You are very welcome to pop in and take a look if you happen to be passing.

## DIVERS DOWN UAE
**STAND NO:** D-16

The Divers Down PADI Instructor Development Resorts are found on the West coast of the UAE in The Riva Palm Jumairah and on the East coast at The Miramar Al Aqah Beach Resort and Spa.

Offering pleasure diving, diver training from beginner to Technical Instructor.
- Gas blending facility
- TDI Technical Diving School

Distributors of diving equipment for Dive Rite USA and Waterproof Sweden.

## GULF MARINE SPORTS
**STAND NO:** D-1

Gulf Marine Sports is one of the leading companies in scuba diving equipment, it was established in 1998 in Abu Dhabi/ UAE and distributes a wide range of snorkeling equipment, Spear fishing and pleasure diving gear.

GMS offer a big range of the most reputable and leading brand names, such as: TUSA, BigBlue Lights, Beuchat, BARE, Cressi-Sub, Underwater Kinetics, Trident, Sea Pearl, ProBlue, Intova, Suunto, PADI, Aqua-Vu Cameras, STINGRAY Swim Suits, and many others.

## AMIT
**STAND NO:** D-42, D-120

مؤسسة عبد الله محمد إبراهيم للتجارة العامة
Abdulla Moh'd Ibrahim Gen. Trdg. Est.

AMIT was established in 1981 with the sole intention to cater for the growing demand of two important aspects of the Middle Eastern society, the love of "Bahar" & "Barr" (Sea & Desert) as people call them.

The company import, export, distribute, supply and carry after sale services of underwater diving equipment and special equipment, providing clients the finest international brands, latest products and superior services.

**UWAHU**
**STAND NO:** D-36

**FOUNDED:** 2004
**UWAHU:** Under Water Human

After many years of globetrotting, sailing and diving the tropics, Uwahu was born as the brain child of two diving buddies that share a passion for the ocean and marine life. Inspired by the big blue, colorful reefs and majestic underwater life they created a clothing line that would evoke feelings of diving with a whale shark in the Andaman Sea or just relaxing on the deck of a sailing boat watching the sunset reflect on tropical waters.

Combining the knowledge of a professional diver and the skills in graphic design is what brought Uwahu to life (man on the manta) as the logo suggests, the brand stands for utter freedom and love for the mysterious depths of our planet. A way of life that divers worldwide can relate to.

Today, Uwahu is a fast growing company specializing in casual scuba dive clothing, scuba dive t-shirts, diving sweaters and hoodies, diver board shorts and dive accessories ready to meet the needs of every scuba diver, free diver or nature lover. Uwahu makes it a priority using high quality materials and durable prints so all you aquanauts can enjoy wearing them as much as we like making them.

**NAUI MIDDLE EAST**
**STAND NO:** D-56

The story of the National Association of Underwater Instructors (NAUI) is the story of how an idea evolved into a vision of how diving instruction should be. It is a vision that is shared by thousands of people for whom scuba diving is not just a recreational pastime, but a passion. Imparting safe diving skills and working in unison to preserve the world's aquatic environments are the noble purpose shared by those pioneers who first formed NAUI. This history chronicles the dedication, hard work and perseverance, the conflict and resolution, and ultimately, the triumph of the philosophy "Dive Safety Through Education." As scuba diving continues to grow in popularity and in the number of participants, your decision to earn the right to join NAUI will be one for which you can always be proud.

Our diving school which is the official appointed Service Centre for the entire Middle East, offers a wide range of NAUI courses, including providing the only Arabic course material within this territory that specialises in:

- Deep Diver
- Dry Suit Diver
- Enriched Air Nitrox Diver
- Scuba Rescue Diver
- Search and Recovery Diver
- Training Assistant
- Underwater Archaeologist
- Underwater Ecologist

**ESAL TRADING**
**STAND NO:** D-94

ESAL started with ESAL Trading LLC as a value added FMCG distribution company in Dubai, UAE in the year 2006, dealing with well recognized international brands.

We gradually expanded our operations and coverage to reach the MENA region and some countries of the CIS.

Our ambition to grow and the experience we gained going through the learning curve of distribution of international brands and developing our in-house brands, made us decide on having our own production and manufacturing facilities in China to focus and specialize in the service of private label.

Now we strive to cooperate with corporates in order to accommodate their needs and create and manufacture new products holding their brand names while assuring the highest quality in accordance to their budgets, guaranteeing a professional standardized service and a solid supply chain and logistics that will make them focus on achieving their sales and operation objectives."

**AL MARJAN BOATS CRUISING**
**STAND NO:** D-24

Al Marjan Boats Cruising is an established, privately-owned enterprise offering marine trips to the offshore islands off Abu Dhabi for local businesses, residents and tourists. It was established in 2015 and is based in Abu Dhabi, the vibrant capital of the United Arab Emirates. Founded by Mr Hamad M Muhairi, whose entrepreneurship and love for both the city and the sea are the embodiment of his latest venture.

**OUR VISION:** To become the UAE's most respected and most innovative boats cruising provider.
**OUR MISSION:** To provide clients with unique experiences, stakeholders with outstanding results and become central to Abu Dhabi's growing tourist trade.

We know Abu Dhabi, and Abu Dhabi knows us, being from the city, we can offer something nobody else can – hidden insights into the hundreds of islands and stunning coastlines that make Abu Dhabi unforgettable. We offer vast types of activities, Scuba Diving, Snorkeling, Fishing, Jet Skiing, Parasailing, Cornish Tours, Traditional Dhow Trips, Swimming Lessons, Pearl Diving, Kayaking, and Camping.

# 1-5 March 2016 | Open 15:00 - 21:30
# Dubai International Marine Club, Mina Seyahi

**JALBOOT MARINE NETWORK LLC**
**STAND NO:** D-5

As the UAE capital's only private, scheduled and multi-destination passenger ferry service, Jalboot gives tourists and residents a new perspective of Abu Dhabi through 100kms of waterway. Seating up to 45 passengers and crew, with a host of on-board facilities, the ferries are the latest generation German design, fully air-conditioned, high-speed and are custom fitted for a safe, comfortable and exciting passenger experience.

Jalboot ferries conveniently link key Abu Dhabi destinations with four strategically located stops which include Etihad Towers, The Fairmont Bab Al Bahr, Yas Marina and Abu Dhabi Mall, with further stops to be incorporated in the near future.The route offers a 360 degree view of Abu Dhabi and is a superb sight-seeing experience and a relaxing alternative to a daily road commute. Boasting panoramic windows, skylights and comfortable leather seating, passengers can sit back and enjoy spectacular views of Abu Dhabi, safe in the knowledge that they're supported by highly trained crew, qualified to international standards.

Jalboot is a home-grown brand that was founded in 2013 by Emirates Consortium, its parent company.

**PURE TECH**
**STAND NO:** D-90

At Pure Tech we are committed to excellence, offering experienced scuba divers in the region only the most innovative services and equipment.

Pure Tech's mission is to provide the highest standards in both customer services and products from high quality brands, with an emphasis on safety and international guidelines.

As the authorized dealer for rebreathers and high end diving equipment in the Middle East, Pure Tech is the go-to hub for Rebreathers and technical diving.

We are the dealers for Halcyon, rEvo Rebreathers, JJ Rebreather, M3S Triton Rebreather, ISC, Shearwater, Bonex, DUI, Analox, Divelime and Ocean Technology Systems.

Our experienced staff and our focus on customer feedback drives us to always set the standards higher, be it in personalized guidance, training, and customer satisfaction.

**SCUBATEC DIVING CENTER**
**STAND NO:** D-50

A 5 Star IDC Center established in 1993 and licensed by PADI, well known in Dubai as one of the friendliest and busiest dive centers. Our team of dedicated and professional instructors will ensure that you gain all the knowledge and experience required to be safe scuba divers.

Scubatec prides itself on the personal touch and prefers smaller groups on dive trips so the divemaster and instructor can dedicate more time and attention to individuals. We also feel the same way about diving courses and can cater to one student at a time, ensuring that you the diver gets the best of our time. We will also fit the timings around your schedules, enabling you to do the courses at your own comfortable pace.

Diving is one of the worlds fastest growing sports. Allow us at Scubatec to show you the magic and thrill that the underwater world has to offer. With Scubatec you can be sure to have a memorable and exciting underwater experience. We sell the following brands: Oceanic, IST, Akona, Sherwood, Gopro and Sealife under water cameras, have a full time repair workshop, and rent diving and snorkelling equipment, as well as offer dive trips in the UAE and Oman.

**DEEP TREKKER INC.**
**STAND NO:** D-26

Deep Trekker Inc. will be unveiling a new underwater drone at the Dubai International Boat Show.

This underwater drone provides live HD footage directly to your handheld controller and is entirely battery operated.

Now anyone can dive deep into the ocean to discover marine life, treasure, sunken ships and more. Be the first to own a personal underwater drone and visit Deep Trekker in the DMEX area at stand D-26.

Learn more at **www.deeptrekker.com**

**DELMA MARINE**
**STAND NO:** D-64

Delma Industrial Supply and Marine Services, was established in 1979 making it one of the oldest marine companies in the UAE.

We offer our customers a wide range of products from internationally reputed companies such as Beuchat (diving equipment), Lewmar (marine accessories), Ultraflex (steering systems), Sea Ray, Boston Whaler, Bayliner and Quicksilver Boats, Marlow (marine ropes), Bob's Machine Jack Plates and of course, Mercury Outboard, Stern Drive and Inboard Engines. We have extended our footprint from our base in Abu Dhabi to Dubai, Fujairah and most recently Ras Al Kaimah.

**AL YOUSUF LLC**
**STAND NO:** D-46

Al Yousuf LLC goes back as far as 1953 when a trade organization was started by Mr. Yousuf Habib Al Yousuf. The main focus was trading between Dubai and other neighboring emirates and countries. Since then, the group has come a long way and currently possess the stature of Limited Liability Company (LLC) in the name of Al Yousuf LLC in the United Arab Emirates.

DMEX
DIVE MIDDLE EAST EXHIBITION

U.A.E. DOLPHIN PROJECT

Support us, report a sighting!

# WHEN THE PUBLIC HELPS SCIENCE…

## DOLPHINS STUDIED FROM LAND AT SAADIYAT ISLAND

FEATURE **DR. ADA NATOLI – FOUNDER OF THE UAE DOLPHIN PROJECT**

Humpback dolphins frequently occur along the Saadiyat coastline very close to the shore and they are easy to spot when the sea is calm. Photo by Alex Moreschini from Bake Public Beach.

The common belief is that dolphins inhabit deep waters in the middle of the ocean. Quite frequently though, dolphins are spotted close to shore. Coastal waters are the natural habitat for a good number of smaller dolphin species that would not consider exploring life in offshore waters, preferring to spend their time close to shore! The humpback dolphin is one such species and also one of the most frequently observed along the UAE coastline.

The UAE Dolphin Project's 'Report a Sighting' system has received over 300 sightings from the general public, since being started in December 2012, allowing us to identify hotspots of dolphin presence in UAE waters. Saadiyat is one of those areas and we now have over 62 recorded sightings thanks to the dedication and perseverance of the management and staff from the local venues at Park Hyatt Hotel and Villas Abu Dhabi, Bake Public Beach and from the local residents. This high number is dependent on the peoples' presence as Saadiyat is one of the most popular beaches in the UAE among tourists and residents.

Why do dolphins frequent this shoreline? How many are there? Are they always the same ones? Would they be the same individuals that frequent the Dubai waters? These questions together with the sighting data received, prompted us to start a survey from land to better assess the frequency of the dolphins and to understand how dolphins utilise the waters in front of the Island. With that, we have the ultimate target of providing more specific information to the authorities that will help them to formulate specific conservation measures to protect the species.

Thanks to the support from TDIC (Tourist Development & Investment Company) that granted us the permit to conduct the survey, and Park Hyatt Hotel and Villas Abu Dhabi whom agreed to give us access to a fantastic land post at the Rooftop bar, the survey succesfully started last December. A group of enthusiastic volunteers joined our effort and thanks to the support of the New York University Community Outreach Office, we also have a group of students eager to get 'hands on' experience in marine mammal research. We conducted the first workshop in December to illustrate the survey techniques and another workshop will be held soon.

Studying dolphins from land – although it sounds less exciting than climbing into a boat and cruising for hours on end – has its advantages. It is in fact the only way that dolphin behavior can be observed without any disturbance or interference. Dolphins can hear our boat engines from far before we can actually spot them, therefore potentially modifying their behavior! From a land post, it is easy to observe the group formation and the behavior and how this changes if there is disturbance.

Saadiyat is a great opportunity to get a better understanding of the local dolphin behavior also in relation to the constant human presence along Saadiyat's beaches. It also demonstrates how important the public involvement is in helping science and represents a great collaboration between scientists, local authorities, universities, venues and the rest of the public all focused to better protect our local marine species and environment.

Now it is a matter of getting the survey done and collecting all the data! Exciting research results will soon be revealed. Watch this space!

A special thank you goes out to Arabella, Alex, Sharis and Nathalie, all the volunteers and the Emirates Natural History Group for their continuous support.

If you would like to volunteer, please sign up at the UAE Dolphin Project website:
**www.uaedolphinproject.org/volunteering**

Surveys are conducted in the morning during weekdays and weekends depending on the weather conditions and volunteers availability.

Our observation point from the terrace of the Rooftop Bar at the Park Hyatt Hotel and Villas Abu Dhabi during a survey. It provides a perfect view of the Saadiyat shoreline.

Volunteers participating in the land based survey workshop held in December 2015 at Saadiyat at the Park Hyatt Hotel and Villas Abu Dhabi and learning about the techniques and protocols utilized during the fieldwork.

### REPORT YOUR SIGHTINGS

If you encounter a dolphin or a whale dead or alive, please send us the Date, Time, Location and we would also love to receive your photos of the dolphins encountered. You will be helping us track the individuals that we already know, or help identify new ones!

**Please send your data via the following available options of your choice:**

**Website:** www.uaedolphinproject.org
**Text:** 056 671 7164
**Email:** sighting@uaedolphinproject.org
**Facebook:** UAE dolphin project
**Twitter:** @UAEdolphinproje
**Instagram:** uaedolphinproject

Along the Saadiyat shoreline, humpback dolphins are often observed socializing, their behavior characterized by evident interactions amongst jumps and splashes. Juveniles and calves are frequently involved.
Photos by Alex Moreschini from Bake Public Beach.

# CORAL WATCH WORKSHOP REPORT 2015

FEATURE **MOHAMMAD GHAVASI – SENIOR EXPERT OF MARINE ENVIRONMENT**
QESHM DEPARTMENT OF ENVIRONMENT, QFZ, QESHM ISLAND, ARABIAN GULF, IRAN

## CORAL REEFS IN CRISIS

Coral reefs of the Arabian Gulf grow under extreme conditions of highly variable salinities and temperatures, thus representing excellent models to study climate change. In 1996, 1998 and 2002, there were massive losses caused by coral bleaching and significant coral bleaching occured in Iranian waters in August 2007, with few eventual affects in the southern Arabian Gulf. In 2015, according to NOAA's bleaching alert in the Arabian Gulf, bleaching occurred in most hard corals in the northern part of the region.

A survey done in August 2015 of Qeshm Island's southeastern reef, recorded water temperatures of 34.5°C and indicated that, based on a statistical analysis, it had a 70% likelihood of representing a small bleaching event. (Data submitted by Mohammad Ghavasi 26.08.2015). Small summer bleaching events had been recorded in recent years, but the number of bleached colonies are more now and include the massive corals belonging to the *Porites sp.* that are the dominant and resistant corals in this reef.

After a recent survey was performed on the bleaching of Qeshm reef, the critical situation has been observed to be due to specific characteristics which include, low depth, close vicinity to the town and frequent SCUBA diving and fishing activities. The Qeshm Department of Environment of QFZ, in collaboration with Green reef Group (GrG), have started to establish a series of coral reef conservation workshops to make local people aware of the change and encourage them to contribute in the importance of reef protection.

The workshops use the Coral Watch method to conduct surveys and report data to the Coral Watch database. The course includes two parts which can be done in a day or two:

1. Presentation about coral reef ecosystems, indicating their threats and how to work with them.
2. Out in the field to run a Coral Watch survey.

Green reef Group (GrG) is a science based institute in Qeshm Island for coral reef studies, conservation and collaboration with international institutes to perform international coral conservation projects. This institute was established by a group of marine biologists and enthusiasts to collaborate with those who want to help coral reefs.

The first workshop was held in September 2015 by Mohammad Ghavasi and joined by 15 volunteers to survey the Qeshm reef and submit data to the Coral Watch website. We had recorded water temperatures of 32°C on this reef, indicating it had a 70% likelihood of a small bleaching event. (Data submitted on the Coral Watch website by Mohammad Ghavasi 03.10.2015).

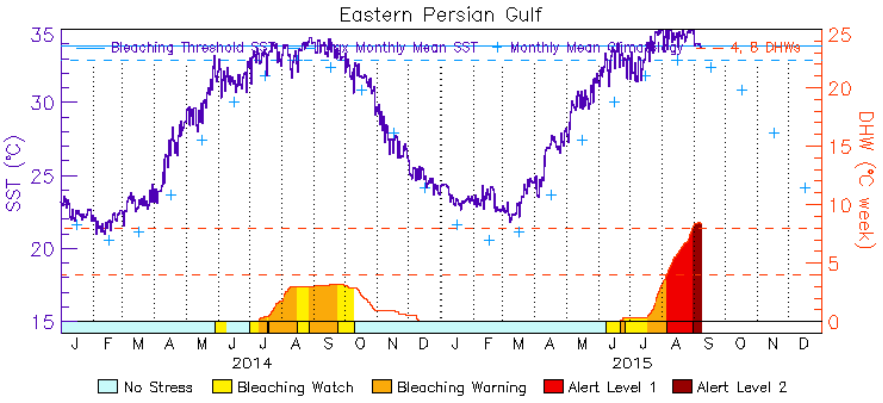
The results influenced other divers, and dive centres and their students to take part in future workshops. Workshops will be held once a month to continue submitting data to the Coral Watch website to monitor our reef conditions. Our future plan is to establish a permanent transect in Qeshm reef. We are looking for advice and donations to continue future conservation work.

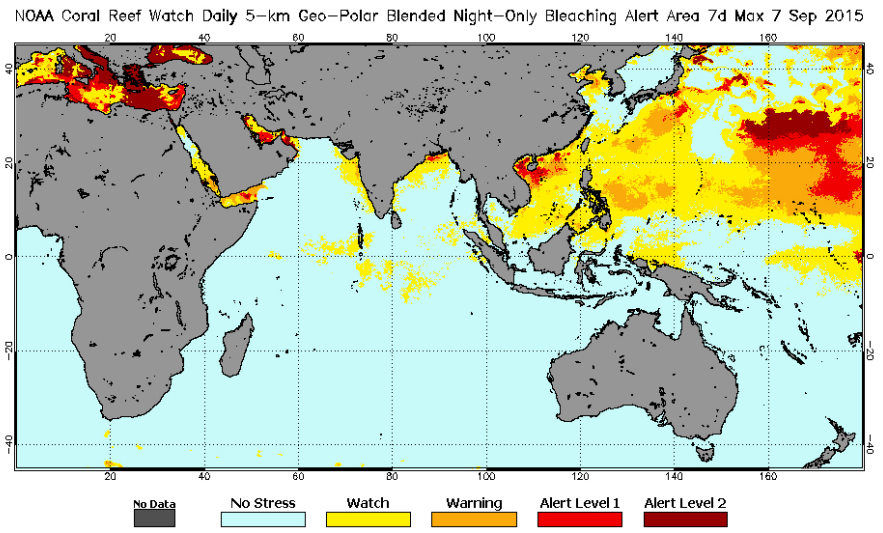
## ACKNOWLEDGMENT:

A big thank you to Mr. Samsam, manager of the Anahita Diving School for being a pioneer in our first workshop; Mr. Dakhteh, manager of the Qeshm Department of Environment of QFZ, for his collaboration, and all the divers that performed a survey and donated to our coral reef conservation.

Please email **marine.gh111@gmail.com** to make a donation, collaborate and/or to receive information about future workshops.





# CORAL REEFS & KIDS

FEATURE **MOHAMMAD GHAVASI – SENIOR EXPERT OF MARINE ENVIRONMENT**
QESHM DEPARTMENT OF ENVIRONMENT, QFZ, QESHM ISLAND, ARABIAN GULF, IRAN

**OCTOBER 20th, 2015** | The first workshop on coral reef education for kids was held in collaboration with Sabz Kanaz Co. who hold a variety of educational and recreational events for children on Qeshm Island, Iran, Arabian Gulf.

I talked with the children about the importance of coral reefs, as well as the impacts climate change and global warming have on the corals. This event was held on South Beach of Qeshm Island and included a sea creature sand sculpting contest.

A group of 25 children enjoyed learning about the coral reefs and their ecosystem. The event was greatly welcomed by families and the children that it encourages us to continue these educational events in the future.

**ACKNOWLEDGMENT:**
A big thank you to Mr. Kasra Ansarinasab, Miss Rabeeh Ansarinasab and Miss Homa Najibi – members of Sabz Kanaz Co. and thank you to Mr. Razazpoor, manager of Iranzamin Resort for their collaboration.

# NAUI GREEN DIVER INITIATIVE: GOLIATH GROUPER STUDY

FEATURE **SAM RICHARDSON, MANAGER NAUI GREEN DIVER INITIATIVE**

Goliath grouper. Photo by Evan D'Alessandro of the University of Miami.

Preparing research boats above and divers ready below for goliath grouper dive. Photos by Geoffrey Shideler.

The king of the grouper family, the goliath (*Epinephelus itajara*) is the largest of the western north Atlantic groupers, reaching up to 450 kilograms and over 2 meters in length. These majestic giants of the sea are a treasured sight for divers that flock to the coral and artificial reefs they call home.

Palm Beach County, Florida USA hosts the largest spawning aggregation of goliath grouper in the world. Each August through October, these extraordinary fish migrate hundreds of miles to South Florida waters to spawn. Divers from all over the world travel in droves to the region every year to witness this spectacular event.

After decades of heavy fishing in U.S. waters, the goliath grouper stocks reached historically low levels, which prompted the closure of the U.S. fishery in 1990 and the Caribbean in 1993. The International Union for Conservation of Nature (IUCN) has recognized the species as "critically endangered."

Recently, there has been a push for Florida fishery managers to lift the harvest ban, which could be detrimental to the species and to the diving community in the region. Professional divers want to keep the fishery closed due to the ecotourism value. But, what is the actual value of the goliath to the dive industry?

The NAUI Green Diver Initiative (GDI), thanks to a generous grant provided by The Henry Foundation, is one of the leading sponsors in a study conducted by the Palm Beach County Diving Association. The study aims to determine the value of the goliath grouper to the dive industry. For the first time ever, the dive industry will have concrete data to present to fishery managers.

The five month study, completed in late 2015, "was accomplished using various methodologies via intercept surveys as divers returned from goliath grouper dive trips," said Geoffrey Shideler, lead researcher. The study "required survey design, implementation and collection, and subsequent analyses of survey results," stated Shideler.

Currently the results of the study are under peer-review, but Shideler agreed to share the following initial summary (please note that these are preliminary results and are still under review and could be subject to change):

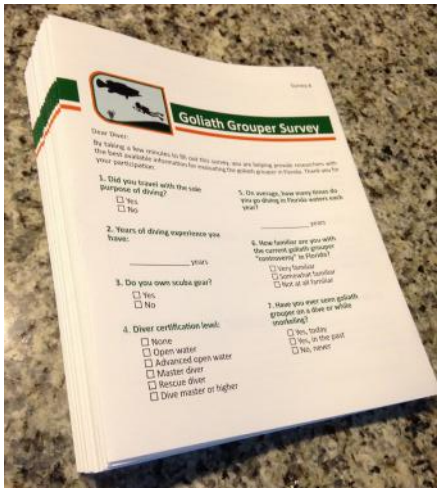
"A previous study estimated that resident anglers in Florida who wanted the fishery open were willing to pay between US$34 and US$79 to harvest a goliath grouper. Using a survey instrument with choice experiments, the present study estimated that divers (n = 1537) off eastern Florida would be willing to pay approximately US$111 to encounter one goliath grouper during the months of their spawning aggregation (August-October), and US$232 if there are 40 goliath grouper (such as is common on many spawning aggregation sites). Results suggested that divers coming from outside of Florida were willing to pay higher rates for goliath grouper encounters; and at spawning aggregations sights, willingness to pay was estimated at US$330.59 for these non-Florida divers. Based on life-history traits of goliath grouper and the high value of their spawning aggregation sites, we suggest any changes in goliath grouper policy that would negatively impact spawning aggregation numbers be made with caution."

The Goliath Grouper Study, conducted by the Palm Beach County Diving Association, is leading the charge by providing valuable data for the dive industry. The decision to open the fishery could have an impact not just on anglers and divers, but more importantly, the goliath they covet.

Visit **www.nauigreendiver.org** to stay up-to-date once the final study has been published.

**About the NAUI Green Diver Initiative:**
GDI is a grass-roots 501 (c) (3) organization fueled by NAUI Worldwide members and friends. Although divers are important to our community, we are open to everyone. Members may be environmental activists, scientist, beach-goers or boaters, all sharing a common and genuine concern for the vitality and sustainability of the marine environment.

We pride ourselves on giving back to our donors and members by providing grants and sponsorships for projects related to the preservation and conservation of our oceans and waterways. A vibrant and clean environment is vital for the long-term sustainability of the diving industry.




Goliath grouper Study Survey. Photo by Geoffrey Shideler.

# AL MARSA TRAVEL LIVEABOARD TRIPS






Travel 120kms from Dubai to the Musandam and be transported into a mystic world of nature as you discover the wonders under the sea. Call Al Marsa Travel – the diving and cruising specialists since 1999 – and check into the traditionally styled livable dhow, equipped with modern amenities. Trips can be booked for a minimum of one night and can go up to seven nights or more. Guests can either enjoy the incredible surroundings as the dhows sail across the picturesque bays or appreciate the exotic marine life spread across over 22 dive sites. An excellent trip for divers (of all levels) with 2-3 dives a day, each dhow is accompanied by a PADI/EFR certified diving crew member. Starting from Dhs750 (per person per night – full board).

Al Marsa Travel is a PADI 5 Star Dive Centre. We opened in 1999, and our office is located in the Dibba Oman Port, on the waterfront. We are also named by PADI as one of their 'Top 10 PADI Dive Centres' across the whole Musandam Peninsula. Over the years we have built a reputation as one of the Musandam's top dive centres, well known amongst the Musandam dive community for our good team spirit and level of professionalism. Dive with us and you can relax knowing you're in the good company of the Musandam's most respected dive operation with some of the region's most experienced professional dive team. We are also listed on www.tripadvisor.com as one of Dibba Musandam's top dive centres.

We are the main recommended dive centre for many national and international travel agents and tour operators offering tours in Oman and have been working with most of these companies for many years and continue to provide our services to their guests, such as Schoener Tauchen, Beluga Reisen, Dive Worldwide, Orca Reisen, SUBOCEA, Dive & Travel, Fun & Fly, and Worlwide Diving. We also have many loyal customers that return year after year and recommend us to their friends, and have therefore built up a good reputation by word of mouth, of which we are very proud.

At Al Marsa, we have a dedicated, permanent team who are all passionate about diving! Our Instructors, Dive Masters and maintenance crew are all highly skilled and qualified and have an excellent command of English. The team have worked with Al Marsa for many years and bring a wealth of diving knowledge and experience that covers all of the Musandam area.

We have many dive sites here in the Musandam, each unique in its own right and breathtakingly beautiful. Our dive team have a sound knowledge of all of the sites and will guide your divers around the best and most famous, including the amazing and famous Octopus Rock, Lima Rock, Ras Marouwi, Ras Sanut, Ras Lima, Om El Fayarin.

The centre is fully equipped with the latest scuba gear and we frequently purchase new kit, everything from the regulators to the fins, BCD's to masks are well known quality brands. We have our own compressor on site and a highly skilled maintenance crew.

## DIVING IN THE MUSANDAM

What really sets this diving apart from the Red Sea is that no one else is in the water within miles – you are out here alone and again that just adds to much of the experience. Given the choice between the overcrowded northern Red Sea or the Musandam peninsula, while the Red Sea definitely offers more variety and colourful reefs, this is a totally overlooked corner of an effectively private diving nirvana; also with guaranteed sunshine.

## QUEEN EXPLORES THE MUSANDAM

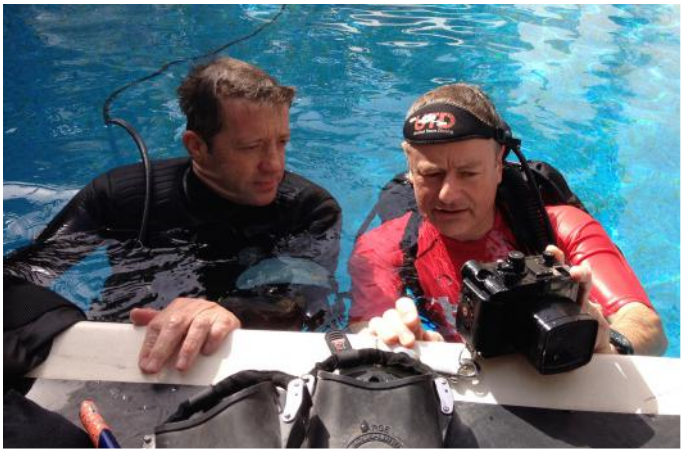
Al Marsa Travel is organizing seven night trips on the new Omani liveaboard, Queen of the Musandam, leaving every Sunday.

The 25m boat has six air-conditioned, en-suite cabins for 12 guests. Sightings on dives amid "dynamic underwater topography" include lobsters, rays, turtles, barracudas and jacks, plus the possibility of whale sharks, sunfish and pilot whales, with a wide range of critters making the Musandam "a macro photographer's delight".

**Al Marsa Travel and Tourism**
**Tel:** +968 2683 6550
**Mob:** +968 9936 3732 (Oman)
**Mob:** +971 50 482 4490 (UAE)
**reservations@almarsamusandam.com**
**www.almarsamusandam.com**

# FREESTYLE DIVERS RETURNS, WITH A DIFFERENCE!

FEATURE AND PHOTOGRAPHY **MARINE AND DARRYL OWEN**



## FREESTYLE DIVERS RELAUNCH

After a change of ownership at the end of 2015, our team has been working hard for the last few months to prepare the re-launch of Freestyle Divers.

We are returning to Dibba to operate out of a brand new dive centre located in Dibba port, from where the boats are already operating.

## UNIQUE UTD COURSE CURRICULUM

We will continue to offer PADI courses that will include some new specialities, however the big evolution will be the addition of the Unified Team Diving (UTD) course curriculum. This will provide a unique opportunity in the UAE for new and experienced divers to enjoy the benefits of the prestigious DIR style of training for both recreational and technical styles of diving.

## OCEAN FRIENDLY AGENCY

As an Ocean Friendly agency, UTD teach all of their courses in neutral buoyancy, right from the very beginning. At Freestyle Divers, we are passionate about protecting the aquatic environment and insist that our instructors and dive masters take care to avoid causing damage to the delicate underwater ecosystem while we are in the water.

## OUR COURSES

We offer a large range of courses that cover all aspects of diving; from teaching complete beginners using highly innovative training techniques, through to technical diving classes based on the most advanced standards in the industry. We have a unique way of teaching recreational and technical diving, complemented by a broad range of courses and activities including wreck discovery and exploration as well as marine science for both adults and children. We teach and dive using a team-oriented approach, using the full range of configurations including Backmount and Sidemount, open circuit and rebreather. For children over 7 years old, we have our Zuba program, which gets kids in the water in perfect safety to learn all the techniques they will use as divers when they get older. We have resident Instructor Trainers who can run local UTD Instructor Development Programs for advanced divers who wish to become Divemasters or Instructors.

## OUR SAFETY STANDARDS

Safety is a primary preoccupation for our activities, for both our divers and staff alike. We ensure that our boats and equipment are maintained to the highest quality standards and that all types of breathing gases are available. We supply the highest quality triple filtered air as well as Nitrox and Trimix blends for all divers who are qualified to use them. We teach Nitrox and Trimix courses as well as basic and advanced gas blending. During the DMEX show, we will be launching a new safety product called RescuEAN. This innovative device allows any nitrox tank or rebreather to be used as a source for emergency oxygen in case of an accident, please stop by for a demonstration, we will have this item for sale at the show.

## THE EQUIPMENT

We also ensure that the right equipment is available for all types of diving. We stock all kinds of basic and advanced equipment for sale and for rental. Whether you need recreational





diving equipment to complete your PADI course or a technical scooter with a set of double tanks, deco tanks and a drysuit for a 60m+ wreck dive, we will be able to help you out. We have a broad range of high quality, hard to find technical diving items at competitive prices that will meet most needs. If we don't have it, we'll do our best to find it for you!

## UNDERWATER MONKEY BUSINESS

Our scooters provide endless hours of fun. Why not come along to try some monkey diving or participate in the legendary Monkey Bash? If you're not sure whether our style of underwater monkey business is for you, feel free to visit us at stand D-28 at DMEX and we'll explain what it's all about.

## OUR APP

A core part of UTD's philosophy is based on unifying the team, both in the water and out. At Freestyle Divers, we include this in everything we do. As one example, we are launching our new mobile app at the DMEX show. It is designed to help all our customers actively participate in our community. You will be kept up to date on all our activities, you can reserve your place for dives and trips, pre-book rental gear or gas fills, participate in our loyalty program to save money and communicate with the whole community to buy and sell equipment, set up your dives or just share your favorite photos or videos. You can also store your diving qualifications on the app too, no need to bring your certification cards any more. All of this is in real time on your mobile phone or tablet.

## COMMUNITY SPIRIT

We are creating an environment that will promote a true community spirit, where fun, a love of the underwater ecosystem and marine archeology combine with a 100% safety record to make your aquatic adventures truly memorable.

## SURPRISES FOR 2016

We are planning a few interesting surprises this year, so if you are looking for some truly innovative ways to learn how to dive, to dramatically improve your existing skills or if you are passionate about diving wrecks or marine biology, please come and talk to us at DMEX. If you can't make the show, feel free to contact Freestyle Divers on Facebook or email us at **info@freestyledivers.me**. You can also find out more about us on our brand new website at **www.freestyledivers.me**.

## PRIZES TO BE WON

If you fancy trying out what UTD training can offer, there are 5 prizes to be won from Freestyle Divers during the boat show, each of them worth more than Dhs1,000. We will be offering five people the opportunity to participate in our Extreme Scuba Makeover course. This is a fantastic way to start your diving experience or to fine-tune your existing diving skills during an intensive one-day workshop. You will leave the course with a new understanding of fundamental techniques that will help you become a more ocean friendly diver.

## YOUR FREESTYLE DIVERS TEAM

We are all very excited about 2016. We have a host of innovative projects underway that will hopefully provide our community with some new and interesting activities above and below water. We look forward to hearing from you and to welcome you to our community.

UTD
Unified Team Diving™

# TREASURE ROOM

STORY BY PATRICK VAN HOESERLANDE ILLUSTRATION PETER BOSTEELS

It was morning and Skubba and Fred were sitting at the breakfast table. Today, they would go diving again. Skubba could now move underwater and he was looking forward to new discoveries. Fred wondered what his friend would ask him to solve next. He felt that there was still much to discover, but had no idea what that would be.

Skubba's mother listened to all their stories of buckets, pumps and windows... until she suddenly told them to put their coats on and wait for her outside. What was his mother up to?

She drove the car out from the garage and asked the boys to get in.

"Mommy, where are we going?" asked Skubba.

"Wait and see. You'll know soon enough," was all she said.

They both looked around to try and guess where they were being driven to. After a while, the car stopped and she parked the car along the side of the road. Where were they?

"Get out of the car boys. We are here," she said.

"Where to?" asked Fred, who had not said a word since they had left the house.

"Over there!" she said as she pointed towards a building with a blue and white flag. Fred thought it was a strange flag, because there was a piece missing.

The moment they stepped through the door, the boys stood rooted to the spot. They were in a room filled with treasure. There were strange things everywhere they looked. And all those things had something to do with water. They looked around with their mouths and eyes wide open.

"Where are we?" asked Skubba.

"In a dive shop. For a dive mask," answered his mother.

"A what?" asked Skubba.

"A dive mask," she said. You have dived long enough with your bucket. It is time we get you a real mask now."

The man from the dive shop showed them a lot of different masks. He said it was important that the mask fits well on the face. The mask had a strap to fit around the head which also had to fit well. Skubba had to pinch his nose while he tried a mask on.

"This way you can clear your ears," said the shop keeper.

Skubba had no idea what the man meant by that. He was not really listening either, as he was too curious about all the other things in the shop.

Fred, who did not want a mask, was wandering around the aisles. He touched everything. He looked at everthing with great attention to detail and read everything there was to read. With all this information, he would be able to help his friend later on.

As Skubba regained himself from the surprise, he now clutched a bag with a mask and a snorkel inside. He looked at them as if they were lumps of gold.

On the way back home, both boys were silent. Skubba dreamt of all the dives he would be able to do with his mask and all the things he would discover.

Fred wondered what all the things he had seen in the store were for. Thick rubber suits, big shoes with which you certainly could not walk. Belts with heavy blocks...

It was only once they had arrived home that they started to talk about all the new things they had seen, and all the things they were planning to do with them.

Skubba's mom? She just smiled.

# BAG DIVING

STORY BY PATRICK VAN HOESERLANDE ILLUSTRATION PETER BOSTEELS

With the autumn's falling leaves, the temperatures began to drop. The warm water at the surface disappeared a little more each day. Skubba had to shorten his time in the water because of the cold. And he did not like it!

Swimming with clothes only gave him a few minutes extra underwater. Once the fabric of his pants and sweater had sucked up the water, he got cold again. His mother was not happy when he came home with a bag of wet clothes, even though he tried to put them in the dryer without her noticing.

Skubba then thought, if you can put wet clothes into a plastic bag, then you can also keep your clothes dry with one. Diving in a plastic garbage bag was not a great success. Firstly, he did not succeed to don the bag without tearing it. Once in the bag, it was an almost impossible task to get into the water. Jumping directly into the water with a bag works well enough from a higher level, but difficult when having to walk in from a slope. During his first few trials, he fell over a few times. His clothes were not only wet, but now filthy. That made Skubba's mother unhappy. It did not help to tell her he was not diving with his clothes on, but instead told her he had fallen into the water. Strangely enough, she did not believe him.

When he finally mastered the art of getting into the water with the bag on, he faced another problem, with standing up above his knees as the bag constricted his legs. It got worse the deeper he went. At the same time, the top part of the bag began to fill with air. He couldn't understand it. This did not happen when he went diving in his swimming trunks. Where was Fred when he needed him?

When he wondered why the water grabbed onto his legs while wearing the bag, he heard laughter. It was Fred. Finally!

"You are just a pear standing in water!" he laughed out loud.

"Why don't you help me instead of laughing at me? Why is this happenening?"

"It's something to do with pressure," Fred explained.

"What pressure?" Skubba asked. "Where is the pressure coming from?"

Fred started to explain the reason step by step. "Pressure occurs when you apply a force on a surface. If you push your hand against a wall, then you exert a force against it3. But you can also consider that your hand exerts pressure. After all, your hand has a certain size which we refer to as the surface. The smaller the surface of your hand, the greater the pressure. If you exercise the same force on a very tiny area, such as the tip of a nail, you could probably make a hole through the wall. So, it is not only important how big the force is, but also how big the pressure is."

"Yeah, I now understand what pressure is, but what has that got to do with me looking like a pear?" asked Skubba after Fred's explanation.

# DIGITAL ONLINE

جمعية الإمارات للغوص

EMIRATES DIVING ASSOCIATION

**PHOTOGRAPHY AND FILM COMPETITION**

# ENTER DIGITAL ONLINE 2016

## EDA'S 8th ANNUAL UNDERWATER PHOTOGRAPHY AND FILM COMPETITION

**COMPETITION OPENED:**
Sunday, 3rd January 2016

**SUBMISSION DEADLINE:**
Thursday, 28th April 2016 @ 11:59 PM (GST)

**AWARDS & EXHIBITION NIGHT:**
Wednesday, 25th May 2016 | 19:00-22:00 | AUD

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# A SUMMARY OF 2015 AND THE GOALS FOR 2016

BY **GREGOR HODGSON, PHD – EXECUTIVE DIRECTOR** PHOTOGRAPHY **REEF CHECK**



Coral reefs and California rocky reef ecosystems are underwater, so they don't get the same attention as polar bears or elephants. Sadly, reefs are "out-of-sight, out-of-mind" for most people. So we need to work extra hard to raise awareness about the issues facing reefs and the solutions we are implementing. Therefore, your continued support for Reef Check is so important.

With your support we have moved to a new Marina del Rey office with classroom space for touch tanks for kids education programs. We also launched the redesigned Reef Check website. We continue to carry out training programs, surveys, outreach and conservation activities in California and around the world. Special highlights of 2015 include:

### TROPICAL PROGRAM SUCCESSES:

- Carried out training and survey expeditions in Indonesia, Maldives, Oman, Philippines and re-launched RC French Polynesia.
- Worked with both the United Nations Development Programme and the UN Environment Programme to raise funds from the Global Environmental Facility to design and implement the first six Marine Protected Areas in Haiti. This includes the "best coral reef in Haiti" that we discovered in 2014.
- Co-wrote a "Consensus Statement on Climate Change" for International Society for Reef Studies then helped to distribute this to key negotiators at the COP21 climate talks and achieve lowered emission targets.
- Prepared and started to implement an "Emergency Response Plan" for the ongoing Global Coral Bleaching Event. Set up and chaired a new Coral Reef Coalition with the National Oceanographic and Atmospheric Administration in Washington DC to address the biodiversity disaster caused by bleaching.
- Worked with RC Australia to produce their 15-year report on reefs of Eastern Australia.

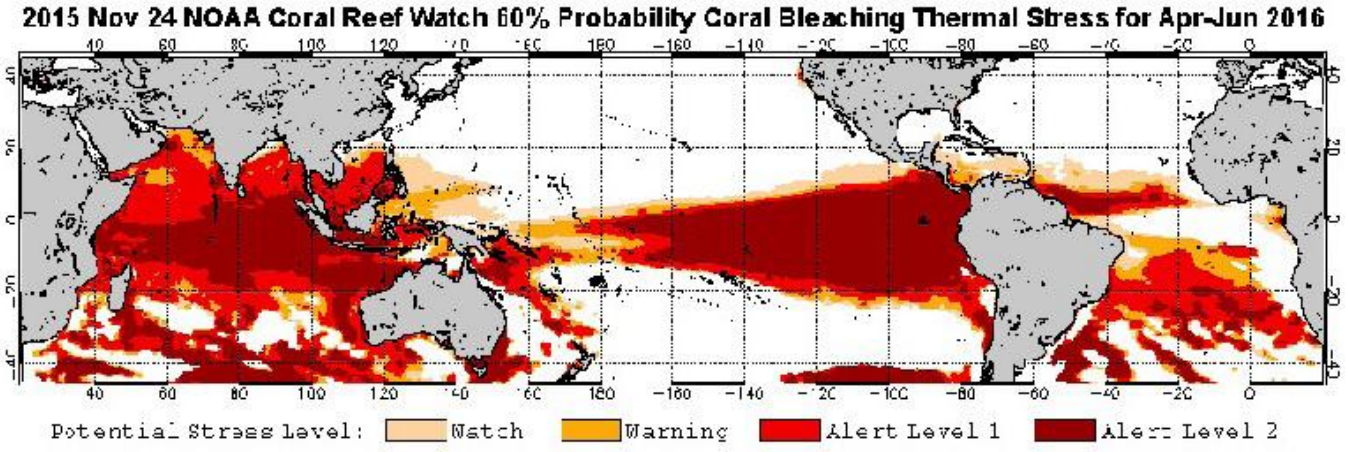
### CALIFORNIA PROGRAM SUCCESSES:

- Completed 17 public, university and aquarium training programs with 162 new EcoDivers trained (an increase of 50 over 2014) and two in Baja, Mexico.
- Completed 90 surveys (up from 75 last year) including 17 new sites.
- Funded Big Sur and Channel Islands surveys through Kickstarter.
- Surveyed Magdalena Bay in Baja California, a former Marine Protected Area.
- Published scientific analyses in respected journals Ecology and BioInvasion Records and co-wrote a report on the status of rocky reef ecosystems in Southern California.
- Working with TNC to design an abalone Fisheries Management Plan for Northern California.
- Designed classroom and on-board ocean education programs for Southern California in collaboration with AltaSea and Tall Ships.

### OUR GOALS FOR 2016 ARE TO:

- Provide incentive funds for tropical small island teams to track the global bleaching event so that managers are not "flying blind."
- Add a tracking function to better track the success or failure of conservation activities on our "Global Reef Tracker" database.
- Assist the government of Haiti, United Nations Environment and UN Development Programmes to design and implement the new Marine Managed Areas in Haiti.
- Add more volunteers and sites in California and internationally to fill in gaps.
- Develop abalone rehab program in Southern California.
- Expand our grades 4-12 student education program in California.

With your help, we can continue the world's only truly global reef monitoring program. Please make your tax deductible contribution to help save reefs at: **https://my.reefcheck.org/myaccount/make_donation.php**




The latest NOAA Coral Reef Watch predictions for the 3rd Global Coral Bleaching Event (April to June 2016) suggest serious bleaching damage will hit reefs from the Great Barrier Reef to Madagascar in a repeat, but worse, 1998 when we lost 15%. Coral reefs have existed for 150 million years and will continue to survive after this event so we all need to work harder to stop global warming and help reefs survive.

# INVASIVE SEAWEED SARGASSUM HORNERI SPREADING IN SOUTHERN CALIFORNIA

BY **CHARLEEN CONLOGUE, REEF CHECK CALIFORNIA VOLUNTEER COORDINATOR**

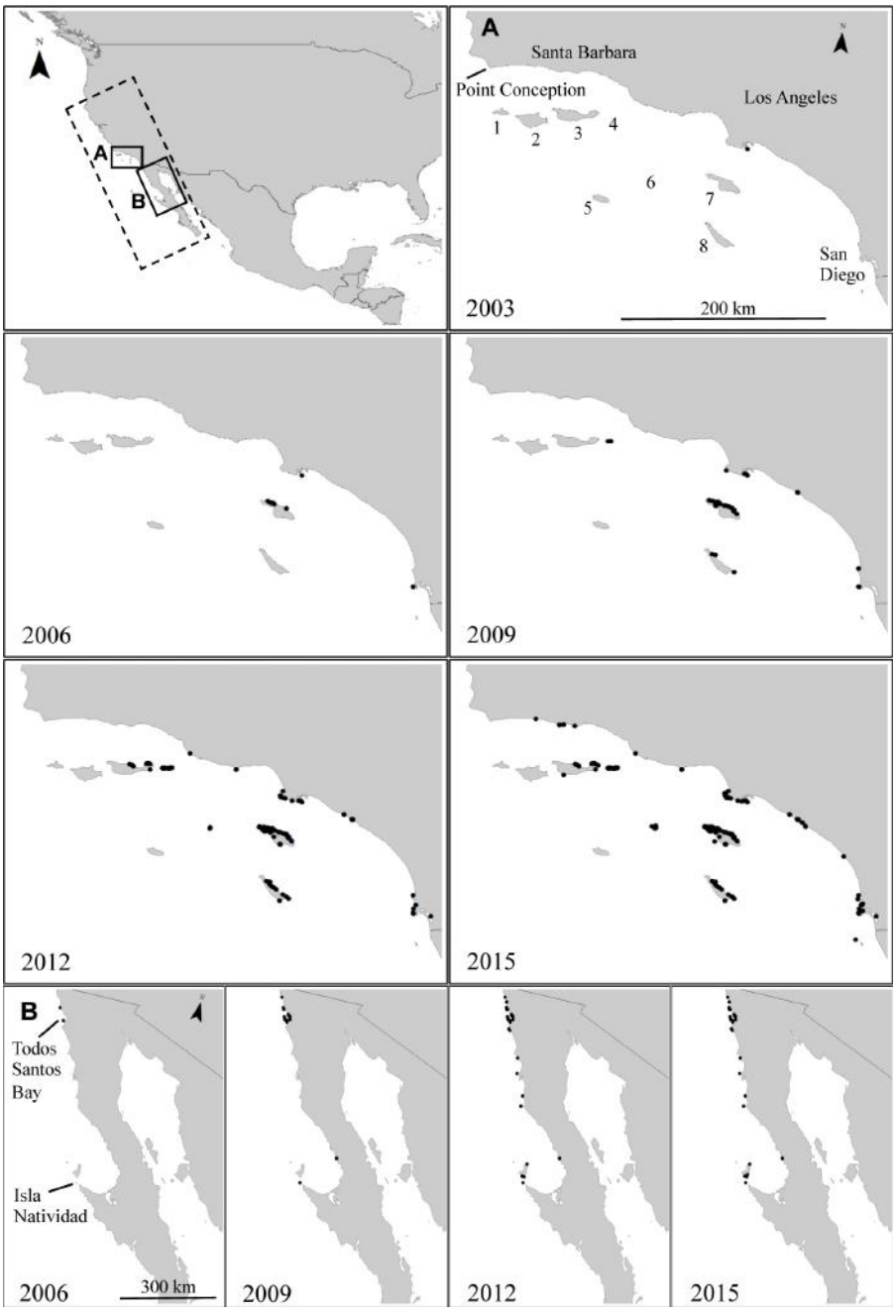
Above left and right: Reef Check divers recording the presence of *S. horneri* at Catalina Island in the spring of 2015. Below: Chronology of geographic expansion of *S. horneri* in southern California, USA (A) and Baja California, México (B) regions.

A recent scientific paper in the Journal 'BioInvasion Records' documented the rapid increase and spread of an invasive alga named *Sargassum horneri* along the coast of Southern California and down into Baja California, Mexico. The seaweed, which is native to the west coast of Japan and South Korea, was first detected in Southern California in 2003 when it was spotted near Long Beach. Reef Check has been tracking this species since 2006 and the data collected by our citizen scientists was used as the basis for this publication. The paper states: "The geographic expansion of *S. horneri* is characterized by isolated introductions to new islands and locations on the mainland widely separated from existing populations, followed by the steady colonization of surrounding areas."

According to co-author Dr. Jan Freiwald, who is also the Director of Reef Check's California Program, Reef Check's consistent monitoring of the kelp forest ecosystems throughout Southern California allowed us to track changes in the *S. horneri* distribution.

The rapid spread of *S. horneri* is affected by both natural dispersal and humans moving individuals unintentionally. For example, divers or boats dislodging algae or fouling of vessels might transport algae to new locations. Based on the water temperature that *S. horneri* typically prefers, researchers predict further spread of *S. horneri* along the Baja coast, and if the ocean warms in the future, it may cause *S. horneri* to continue expanding northward along the California coast.

In response to the rapid spread of this invasive algae, Reef Check California recently revised its monitoring protocol so that our citizen scientists are not only recording the presence or absence of this species at our monitoring sites, but also quantifying the amount of *S. horneri* found at each site. With 90 monitoring sites statewide and three monitoring regions in Baja, Reef Check California will continue to look for this invasive species and report on its spread. Reef Check's observations of *S. horneri* can be found on our online database – the Global Reef Tracker.




**Citation:** Marks, L. M., et al. (2015). Range expansion of a non-native, invasive macroalga *Sargassum horneri* (Turner) C. Agardh, 1820 in the eastern Pacific. BioInvasions Records, 4(4), 243-248.

# UPCOMING REEF CHECK ECOEXPEDITIONS

## REEF CHECK TOBAGO ECOEXPEDITION: **TRINIDAD & TOBAGO**


Photo by ERIC Tobago

Northeast Tobago comprises a diverse range of ecosystems that in turn support a globally valuable level of biodiversity in terms of at risk and endemic species, migratory, iconic and commercial species, including the IUCN critically endangered hawksbill turtle and the EDGE-recognised Orbicella coral.

A one or two week Reef Check EcoExpedition is your opportunity to make a valuable contribution to the development of conservation management in Tobago. Working alongside the marine biologists at ERIC, you will attain your Reef Check EcoDiver certification before carrying out daily Reef Check surveys in the area as well as exploratory research dives to help build a comprehensive understanding of the status of the local reefs.

Additionally, you may have the opportunity to take part in a visit to our tropical forests and engage in marine bird monitoring at one of the largest colonies of magnificent frigatebirds in the Caribbean, as well as attending evening presentations on topics of ecological and conservation interest.

For more information visit:
**www.eric-tobago.org**
**Email:** info@eric-tobago.org

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## REEF CHECK / BIOSPHERE EXPEDITIONS ECOEXPEDITION: **MALDIVES 9-15 JULY 2016 (ONLY $2490)**


Photo by Biosphere Expeditions

This SCUBA diving voluntourism expedition will take you to the beautiful 26 coral atolls that make up the Republic of Maldives. There you will help marine biologists study and protect its spectacular coral reefs and resident whale shark population. All this because the Maldives government identified a need for further research and monitoring work as far back as 1997. Biosphere Expeditions is addressing this need with your help and will train you as a Reef Check EcoDiver. With this qualification you will then gather important reef and whale shark data. This year you will document bleaching.

For more information about the Maldives EcoExpedition and how to sign up, please visit this link:
**http://biosphere-expeditions.org/maldives**

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## REEF CHECK / BIOSPHERE EXPEDITIONS ECOEXPEDITION: **MALAYSIA 16-23 AUGUST 2016**

This SCUBA diving expedition will take you to Tioman, the Malaysian island named by Time Magazine as one of the world's most beautiful. Working in a small group of fellow divers, and based on a very comfortable and modern liveaboard yacht, you will assist the local researcher to study and protect the local Marine Park's beautiful but fragile coral reefs. Diving two to four times a day, the expedition includes training as a Reef Check EcoDiver. Please note that you need to be a fully qualified diver to take part in this expedition (minimum PADI Open Water or equivalent).

For more information about the Malaysia EcoExpedition and how to sign up, please visit this link:
**http://biosphere-expeditions.org/malaysia**

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## REEF CHECK / BIOSPHERE EXPEDITIONS ECOEXPEDITION: **MUSANDAM, OMAN 23-29 OCTOBER 2016**


Photo by Wouter Kingma/Biosphere Expeditions

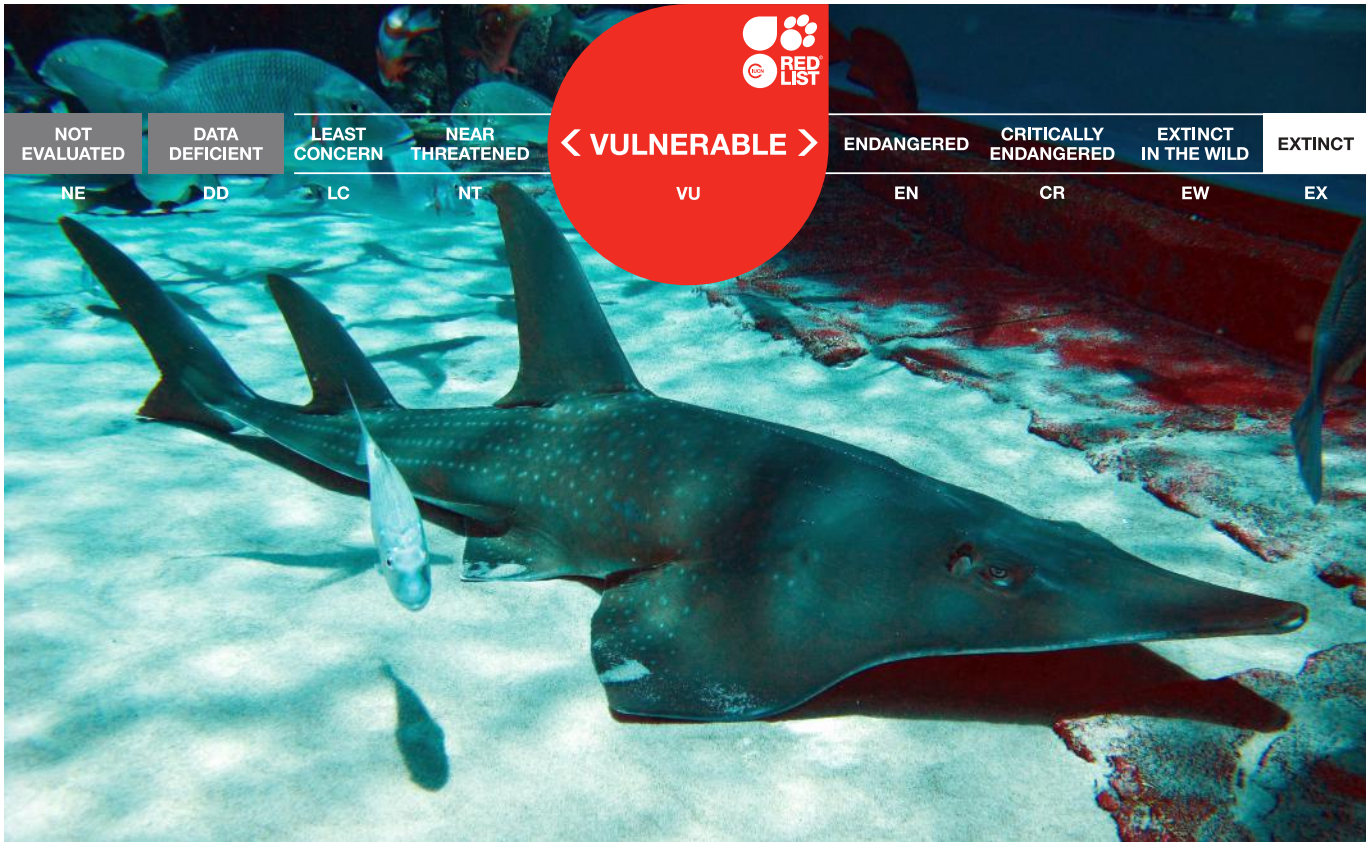
This SCUBA diving citizen science expedition will take you to the United Arab Emirates and from there to the remote and mountainous Musandam peninsula of Oman. There you will study the diverse coral reefs fringing the areas where the mountains plunge into the Arabian Gulf and the Gulf of Oman. The reefs boast a rich mixture of beautiful corals and a multitude of fish and other animals. This pioneering study to map this unique underwater environment has already led to the creation of two protected areas. More data on the biological status of the reefs and of population levels of key indicator species are needed for educational purposes and to be able to put forward more ideas for more and larger marine protection areas. Data collection using Reef Check methods will also be used to make informed management and conservation decisions within the area. The expedition includes training as a Reef Check EcoDiver.

For more information about the Oman EcoExpedition and how to sign up, please visit:
**http://biosphere-expeditions.org/musandam**

# FEATURE CREATURE

## GIANT GUITARFISH (*RHYNCHOBATUS DJIDDENSIS*)

FEATURE **IUCN RED LIST 2006** PHOTOGRAPHY **DR. RIMA JABADO – GULF ELASMO PROJECT**

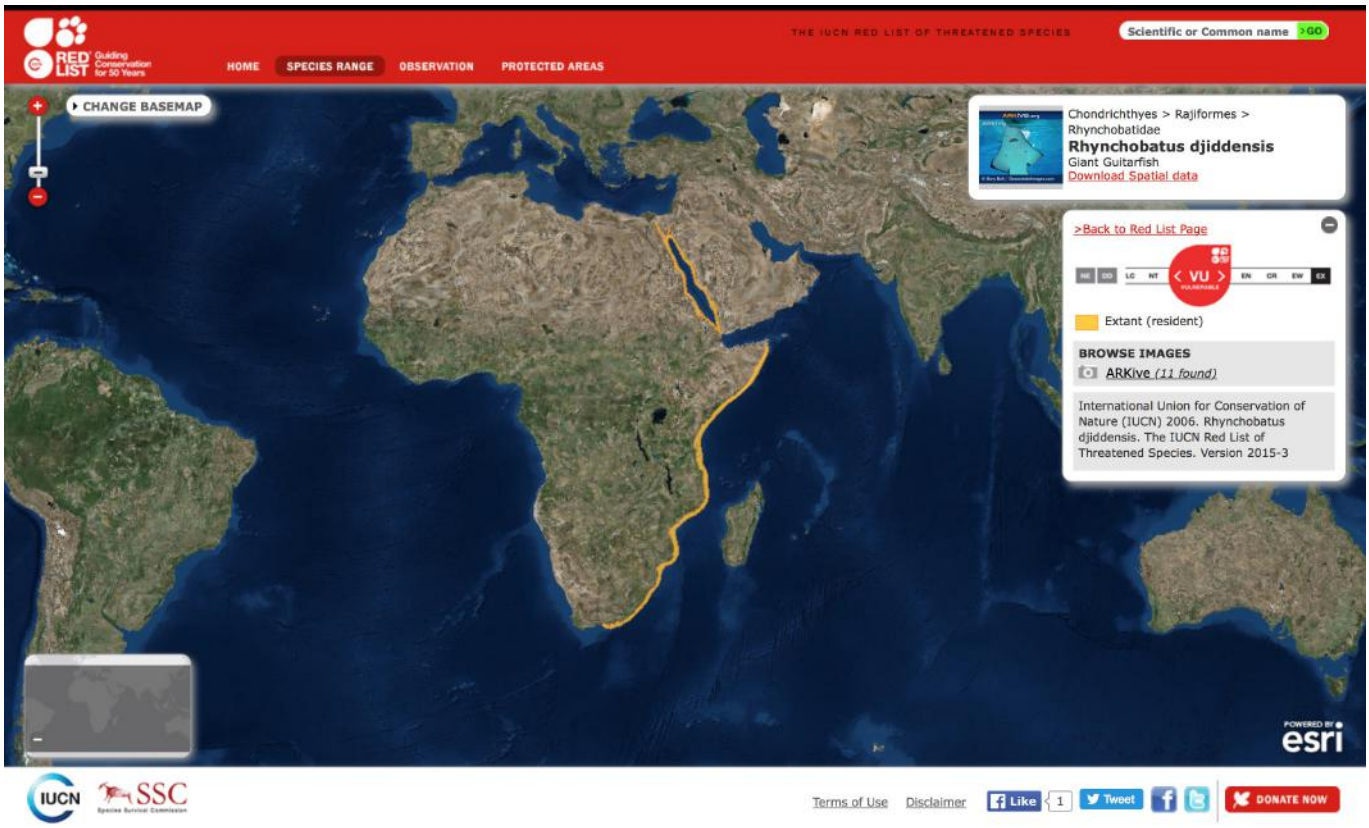



**RED LIST CATEGORY & CRITERIA: VULNERABLE**

**Scientific Name:** *Rhynchobatus djiddensis*
**Common Name(s): English:** Giant Guitarfish, Whitespotted Wedgefish

**Taxonomic Notes:** The species previously referred to as the wide-ranging *Rhynchobatus djiddensis* is a species complex of at least four species (L.J.V. Compagno pers. comm. in: Cavanagh et al. 2003). The current known range of *R. djiddensis* is in the Western Indian from the Eastern Cape Province, South Africa, to the Red Sea. It is not known whether it occurs off Madagascar, where at least two other species of *Rhynchobatus* do occur (L.J.V. Compagno pers. comm. 2003).

**Justification:** A large (reaching 310cm total length) Western Indian Ocean inshore guitarfish, distributed from the Red Sea to South Africa. There is little information available on the biology of the species. It does however have a low fecundity of four pups/litter and preliminary tagging data indicate very slow growth rates. In general, the large size and nearshore habitat of this species make it highly susceptible to artisanal fishing with gillnets and other gear, and to shallow water demersal trawling. Off Tanzania *Rhynchobatus djiddensis* is exploited commercially, primarily for fins, in bottom-set gillnets and possibly also by spearfishermen, and is also a component of the bycatch in prawn trawls. Although species-specific data are not provided, it is likely that *R. djiddensis* is an important component of coastal elasmobranch catches in Kenya where artisanal gillnetting as well as prawn trawling occurs, together with an established trade in shark fins. By inference the same would apply for Mozambique, where similar fisheries occur and where fins are the main product supporting shark fishing. Additionally, there are presently some 150 to 200 foreign vessels targeting shark fins off East Africa and the Middle East in the Western Indian Ocean. One of the primary target species of these mostly Taiwanese flagged vessels is giant guitarfish. This fishery is operating over a large proportion of the species' range and is known to be poaching from territorial waters where surveillance and policing are often insufficient. Recent arrests of foreign vessels illegally fishing off Mozambique have confirmed large catches of giant guitarfish occurring in this area. The only catch data series available for this species are from the protective shark nets and recreational angling in KwaZulu-Natal (KZN), South Africa, neither of which indicates a significant decline in catch, and from these fisheries significant numbers of *R. djiddensis* are released alive. In addition, prawn trawlers operating off central KZN take this species as bycatch. Most individuals are alive and released, although subsequent survival is unknown. Although the species faces less threats in this area, and the population there appears stable, catches are seasonal and it is possible the animals may also move to Mozambique, where they are being increasingly caught. The exceptionally high value of (among the most valuable of all elasmobranchs) and demand for the fins, palatability of the flesh and limiting life history characteristics, render the species vulnerable to overexploitation throughout much of its range. Although little data is available on the species' population status, given its susceptibility to capture by multiple gear types, the known heavy fishing pressure from local and foreign vessels in parts of its range and its high value fins, it is highly likely that numbers have been significantly reduced. Serious declines have occurred in populations of similar species for the same reasons, thus *R. djiddensis* is assessed as Vulnerable globally due to inferred population declines and continuing, unregulated high levels of exploitation. Information is required on this species from the Red Sea region, and species-specific monitoring and assessment of population status is essential throughout its




range as a basis for regulation of its exploitation and trade.

**Range Description:** Western Indian Ocean from the Red Sea to the Eastern Cape in South Africa.

**Countries occurrence: Native:** Djibouti; Egypt; Eritrea; Kenya; Mozambique; Oman; Saudi Arabia; Somalia; South Africa; Sudan; Tanzania, United Republic of Yemen.

**FAO Marine Fishing Areas: Native:** Atlantic – southeast; Indian Ocean – western

**Population:** In South Africa, although it reaches the Eastern Cape Province, it is common only in KwaZulu-Natal (KZN).

**Current Population Trend:** Decreasing

**Habitat and Ecology:** Occurs on the continental shelf to 70m (generally to 35m). A large (reaching 300cm TL) inshore guitarfish. Relatively little information is available on this species across its range. Off KwaZulu-Natal (KZN), South Africa it occurs mainly off sandy beaches during summer (van der Elst 1988), where it is especially abundant in the surf zone but does occur along the edges of deeper reefs down to 30m. Tagged animals have been shown to travel a mean distance of only 49km, reflecting local movement during the summer (Mann 2003). It is unknown where the animals go in winter but it is possible that they move north into the warmer waters of Mozambique.

Over the period 1981 to 2000 *R. djiddensis* catches constituted 33.5% of the total batoid catches in the protective shark nets of KZN, South Africa (Young 2001). Females dominated by 1.95:1, significantly different from unity. Catches are strongly seasonal, occurring primarily (77%) in the summer months of December to April. The median size of females caught (175cm precaudal length; PCL) was significantly greater than that of males (148cm PCL) and there was no significant change in size of animals caught between 1981 and 2000.

Initial indications from tagging data are that growth is very slow (Bullen and Mann 2003). This species is aplacental viviparous, with low fecundity (four pups/litter; van der Elst 1988), but little other details of reproductive biology are known.

Diet includes crabs, bivalve molluscs and small fish (van der Elst 1988).

## LIFE HISTORY PARAMETERS

**Age at maturity (years):** Unknown.
**Size at maturity (total length):** 150cm TL (sex not specified; van der Elst 1988).
**Longevity (years):** Unknown.
**Maximum size (total length):** 310cm TL (Compagno et al. 1989).
**Size at birth:** 60cm TL (van der Elst 1988).
**Average reproductive age (years):** Unknown.
**Gestation time (months):** Unknown.
**Reproductive periodicity:** Unknown.
**Average annual fecundity or litter size:** 4 pups/litter (periodicity not given; van der Elst 1988).
**Annual rate of population increase:** Unknown.
**Natural mortality:** Unknown.
**Systems:** Marine

**Major Threat(s):** The restricted coastal habitat, limited life history characteristics, susceptibility to capture in various gear types, and ever growing demand place coastal rhynchobatids amongst the most vulnerable chondrichthyan fish.

Most detailed information on catches of *R. djiddensis* is from South Africa and further data are required from throughout its range where the species faces a number of threats.

**South Africa:** The mean annual catch in the KZN protective shark nets, South Africa, over the period 1981-2000 was 118 individuals, of which 74% were released alive (Young 2001). There was no significant trend overall (Young 2001) but catch and catch rate declined during the 1990s. Survival of released animals is unknown but, of 460 netted animals tagged and released between 1988 and 2002, 32 (7%) were recaptured (Natal Sharks Board unpublished data). There was no change in the mean size of animals caught in the nets during the time period examined (Young 2001).

Catch rate (number of fish per angler hour) in competition shore angling in KZN showed an increase over the period 1977-2000, as did the mean mass of animals caught (Pradervand 2003). By contrast, anecdotal reports from anglers indicate that the species is less commonly caught than in previous years (Mann 2003). Pradervand (2003) notes that targeting biases do occur in competition shore angling. Hence it is possible that such biases may mask any decline in abundance. A popular target species for shore anglers because of its fighting ability, it has become common practice

to release these fish (van der Elst 1988). Of a total of 3,426 animals tagged (including those caught in the shark nets), 198 (5.8%) have been recaptured (Mann 2003).

*Rhynchobatus djiddensis* is taken as bycatch by demersal prawn trawlers operating in 20 to 45m depth on the Tugela Bank off central KZN, primarily in summer and at a rate of 123 to 231 per year (Fennessy 1994). Most (82%) of those caught in a sample of 100 trawls were alive and released, although subsequent survival is not known.

**Outside South Africa:** Various fishing activities impact *R. djiddensis* over most of its range outside of South Africa. In most, if not all cases, however specific data are limited. Increased local and foreign targeting and landing of giant guitarfish threatens the species across its range.

The fins from large animals of this species and other members of its genus fetch exceptionally high prices, creating a significant incentive for bycatch to be retained. The species is exploited commercially, primarily for its fins, off Tanzania in bottom-set gillnets and possibly also by spearfishermen (Barnett 1997, Saleh Yahya pers. comm. Institute of Marine Sciences, Zanzibar, September 2003). Given the ready accessibility of the species (due to its size and inshore habitat) and the high value of its fins, these catches are cause for particular concern (Barnett 1997). It is also taken as bycatch by prawn trawlers off Tanzania (Barnett 1997). In neighbouring Kenya there is artisanal gillnetting as well as prawn trawling, and there is an established trade in shark fins (Marshall 1997). Although species-specific data are not provided, it is likely that *R. djiddensis* is an important component of coastal elasmobranch catches in Kenya.

Similar fisheries occur in Mozambique (Sousa et al. 1997) and where fins were the main product supporting the shark fishing industry (Mihara and Donato 1986 in Sousa et al. 1997). Large *Rhynchobatus djiddensis* are landed for their fins by artisanal fisherman in southern and central Mozambique and this practice is increasing (Andrea Marshall, University of Queensland, pers. comm). Furthermore, catches of *R. djiddensis* by recreational anglers have also been recorded in southern Mozambique (Sousa et al. 1997).

Inshore fisheries (including gillnet and trawl) are also prevalent in the Red Sea, where it is an important landed species (Bonfil and Abdallah 2004). Catch data from this area are required.

It is not, however, solely local fishing activities that impact upon *R. djiddensis*. Of great concern is the large number of foreign vessels targeting guitarfish fin in the region. At the time of writing, there was some 150 to 200 Taiwanese operated fishing vessels (most Taiwanese flagged vessels, some Indonesian flagged) fishing for shark fin off East Africa and the Middle East in the Western Indian Ocean (IOTC 2005). The main target species for these fishers is reportedly hammerhead sharks and giant guitarfish (IOTC 2005). The fishing grounds targeted by these vessels can be divided into two areas: 1). Offshore Mozambique, Tanzania and Madagascar (almost year-round fishing season), and 2). Offshore Oman, Yemen and Somalia (April to July) (IOTC 2005). These areas represent large proportions of the giant guitarfish range. These foreign vessels are known to be poaching from territorial waters where surveillance and policing are insufficient (IOTC 2005). A recent report of illegal fishing by foreign vessels in Mozambican waters included a seizure of an entire cargo consisting of sharks, mostly *R. djiddensis*.

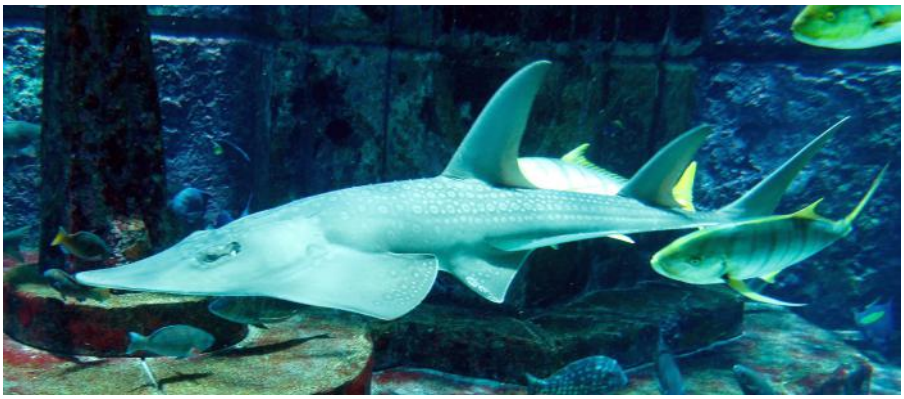
Habitat modification/degradation, including to inshore nursery areas, from human activities (fisheries, pollution, coastal impacts) are likely affecting this species given its inshore occurrence.

**Conservation Actions:** Monitoring and documentation and direct and indirect artisanal and commercial catches is required where the species is being fished. Species-specific catch and effort data should be collected throughout its range, which will require capacity-building, education and training programmes. Further investigation into the taxonomy, population and range, biology and ecology of *R. djiddensis* is urgently required. Harvest and trade management is needed, including control of fin trading activities where they occur and as such precautionary curtailment of commercial exploitation throughout its range is recommended given that it will not be able to sustain intense and uncontrolled targeting.

The recreational line fishery in South Africa is managed by a bag limit of one/species/person/day for unspecified *chondrichthyans*, which includes *R. djiddensis*.

The development and implementation of management plans (national and/or regional e.g., under the FAO International Plan of Action for the Conservation and Management of Sharks: IPOA-Sharks) are required to facilitate the conservation and management of all elasmobranch species in the region. See Anon. (2004) for an update of progress made by nations in the range of *R. djiddensis*.

**Citation:** Dudley, S.F.J. & Cavanagh, R.D. 2006. *Rhynchobatus djiddensis*. The IUCN Red List of Threatened Species 2006. **www.iucnredlist.org**



# A SECOND CHANCE FOR MAYA
## RESCUING A SEA TURTLE IN THE UAE

FEATURE **DANIEL BIRKHOFER – OUTDOOR UAE** PHOTOGRAPHY **DUBAI TURTLE REHABILITATION PROJECT**

It was the long Eid weekend, and we made the plan to explore the beaches in the western region of Abu Dhabi in the quest to find a nice camping spot. Despite the long coastline of the country, it is very hard to find any camping spots on the beach especially ones where you have the beach for yourself.

After a long drive, we finally found a nice spot after Jebel Danat with long beaches and a view of the open sea. The only bad thing was the rubbish and subsequent dirt, which is found on almost all the beaches in this area. Luckily the water was clean and crystal clear, so we enjoyed the water during the day to cool down, even though the sea was extremely shallow.

After an afternoon paddle, we were walking back in the shallow water when we saw a little sea turtle looking up at us. The turtle didn't make any attempts at escape as we moved closer. When we reached the turtle, we could see that she was weak and in distress, and so we picked her up for an inspection. The poor little thing was covered in barnacles and looked very thin. With the best of intentions, I carried the turtle to our camp in an attempt to help her, however, I didn't know much about sea turtles and what I should do. One thing was very clear though and that was that she needed help.

A few years ago, I had found a turtle in a similar condition, and trying to help her, we removed the barnacles and placed her back in the sea. We originally had the same plan for this small turtle which we affectionately named, 'Maya'. Ally Landes from the Emirates Diving Association was within our group, and knew a little bit more about sea turtles than we did. Ally identified Maya as a juvenile hawksbill sea turtle, which is listed as Critically Endangered by the International Union for Conservation of Nature. The hawksbill has recently seen a huge decline in numbers due to various human activities, and they are now at severe risk of extinction in the wild. Ally advised that the barnacles should not be forcibly removed, as this can cause pain and damage to the fragile sea turtle.

Ally then called David Robinson from the Burj Al Arab Aquarium Team and the Dubai Turtle Rehabilitation Project (DTRP) to get some expert advice. Based at the Burj Al Arab Jumeirah and Madinat Jumeirah, the DTRP is run in collaboration with Dubai's Wildlife Protection Office, with essential veterinary support provided by the Dubai Falcon Hospital and the Central Veterinary Research Laboratory. The day-to-day running of the project and the animal husbandry is managed by the Burj Al Arab's dedicated aquarium team. The DTRP is the only dedicated sea turtle rehabilitation facility in the UAE and rehabilitates hundreds of sick and injured sea turtles every year.

David explained that the barnacles, although they look bad, were not the actual problem. Sea turtles are reptiles and as such are cold blooded which means they gain their body heat from their environment, in this case, the surrounding seawater. Every winter, as the regional seawater temperatures start to drop, sea turtles (especially juvenile hawksbills), struggle with the colder water and some become lethargic and sick, and can wash up on the beaches, just like 'Maya'. Barnacles are natural parasites on sea turtles, and a healthy sea turtle can control its barnacle load by scratching them off on rocks and corals. If a turtle is found with excessive barnacle growth, this is an indication that something is very wrong with the animal itself and that this turtle has been sick for some time. Removing the barnacles from the animal causes damage to the carapace and internal bleeding.

With this new knowledge, I feel sorry for what I had done to that poor turtle I had found a few years ago. I think it is good to help if you can, and that it is okay to try to help, even if you make a mistake, but, if there are experts to help, you should call them and you should know who they are.

Everyone knows how to call an ambulance in an emergency and so, if you spend a lot of time on the sea or at the beach, you should know about the Dubai Turtle Rehabilitation Project and save their number (**+971 4 301 7198**). This way, if you are in a similar situation to us, you will know the right thing to do for the animal.

Maya is currently doing well under the care of the DTRP team, she is putting on weight and has been treated for several severe ailments. Later in the year when the sea temperatures warm a little, she will be released back into the Gulf and enjoy a second chance, thanks to everyone involved.




DUBAI TURTLE REHABILITATION PROJECT

Jumeirah
HOTELS & RESORTS
STAY DIFFERENT™

If you find a sick or injured sea turtle on the beach, please do not attempt to remove any barnacles (again, the barnacles are a symptom that something else is wrong).

**Tel:** +971 4 301 7198
**Email:** baaaquarium@jumeirah.com

To get more information about the DTRP, please visit:
www.facebook.com/turtle.rehabilitation

# IS THE UNITED STATES NAVY STILL USING DIVE TABLES?

FEATURE **PATRICK VAN HOESERLANDE** PHOTOGRAPHY **U.S. NAVY**

U.S. Navy photo by Mass Communication Specialist 1st Class Blake Midnight

The impact of the U.S. Navy dive program on the diving world is monumental. The major contributing source to scientific research in diving was undertaken by the United States government, and indeed the U.S. Navy in particular.

In 1898 the U.S. Navy led the way in the development of decompression theory through their involvement with the investigation of the USS Maine which had been mysteriously sunk off the coast of Havana, Cuba. Shortly after, the rest of the world saw the possibilities of having military divers and began developing their own diving programs.

In 1915, the U.S. Navy published a report featuring the Haldane tables that included schedules for dives to depths of up to 204fsw (62 meters). The introduction of an additional tank that allowed a diver to break free from the surface supplied air and venture to deeper depths, led the U.S. Navy to the publication of the Diving Manual of 1916 which included schedules for diving to depths of 250fsw (76 meters) on compressed air.

In 1924, experiments at the Bureau of Mines Experimental Station in Pittsburgh, Philadelphia clearly showed that there were immense advantages using helium-oxygen (Heliox) mixtures for diving to deeper depths. Three years later, the U.S. Navy opened the Deep Sea Diving School (DSDS) and the Experimental Diving Unit (EDU) at the Washington Naval Yard to find a resolution to oxygen toxicity limits. Oxygen toxicity occurs as a result of aspirating higher pressures of oxygen. Deep sea mixed gas tables that incorporated helium into the breathing mixture began to form.

The contributions of Cousteau, another colossus in the diving world, were immediately transferred to the war effort in 1943 and put into practical application by the U.S. Navy through the elite Navy frogmen, equivalent to today's SEALs. A mere six months later, Navy divers made dives to depths of 304fsw (93 meters) for salvage operations of the USS F-4 submarine, which had been sunk off the coast of Honolulu, Hawaii. Due to the depth and necessary decompression, the divers were only able to remain on the bottom for short 10 minute durations, during which they were highly affected by what we now know as nitrogen narcosis.

Dr. Wienke, in 1992, broke away from the Haldane theory which focused strictly on dissolved gas and formed the Reduced Gradient Bubble Matrix (RGBM) which included the mechanics for dissolved gas and bubble dynamics. RGBM was partly constituted for the habits of recreational divers, however, the U.S. Navy also was in need of such tables to combat the stress of repetitive shallow working dives. Civilian institutions started to drive the enhancement of decompression theory, but credit remains with the Navy for providing much of the initial research and testing.

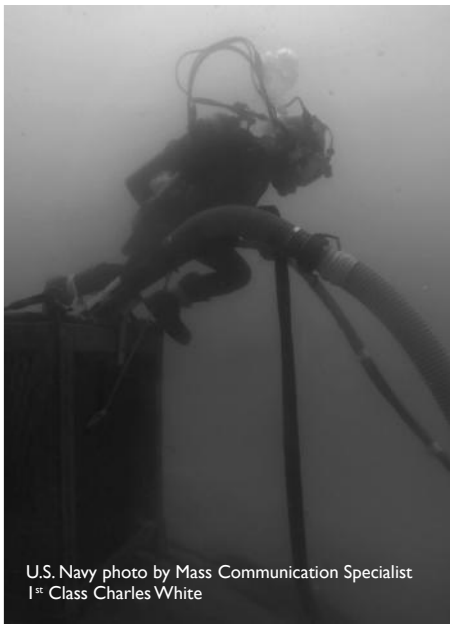
My admiration for the efforts done by the U.S. Navy started with my first manipulation of dive tables. Although they were a simplified version for SCUBA diving, the knowledge and experience captured in the original tables were still present. As I advanced along my diving career, the hunger for more in-depth knowledge led me to the U.S. Navy Dive Manual. Discovering this basic document felt like finding the Holy Grail. My temporary move to the USA created an opportunity to meet a U.S. Navy diver that I could not miss. The interview would give the possibility to get a vivid glimpse at grand history. And to get the answer to a burning question: Do the U.S. Navy still use their dive tables?

## THE INTERVIEW

The day of the meeting, I drove to the Joint Expeditionary Base Little Creek, Virginia Beach, Va. The directions in the e-mail lead me to a building with a giant "crab" as its guard. The front gives away that this is the home of an Explosive Ordinance Disposal (EOD) group – home to specialists that utilize dive techniques

U.S. Navy photo by Mass Communication Specialist 1st Class Charles White


U.S. Navy photo by Mass Communication Specialist 2nd Class John Callahan


U.S. Navy photo by Mass Communication Specialist 1st Class Charles White

to approach explosives underwater in order to neutralize them. Although diving is only a means of transportation, it is a means that you have to master to near perfection in the vicinity of a device designed for destruction.

As I stepped through the door, I felt like I was entering the front office of the Walhalla for divers. This is a once in a lifetime opportunity, and I have all intentions to make the most of it. My point of contact, Lieutenant Dougherty, picked me up and I followed her to a small room. There, I met the dive officer of EOD Group 2 (EODGRU2): Chief Warrant Officer 3 Coy Everage. Hearing the title 'Dive Officer', I expected to interview a person with the rank of an officer, but officers who dive are rare in the Navy and none of them are in an EOD position. This surprised me because the number of divers certainly warrants enough officer level positions. These officers could be influential in promoting the diving community.

After the introductions, we were ready to start the interview.

## SELECTION AND TRAINING

Divers are not specially recruited, meaning they all start in boot camp as every other recruit. Many do however, enter boot camp on contract to become Navy Divers. Additional recruits that have interest in becoming a diver may join special work-outs and pool training after the boot camp sessions to prepare them for the selection and training as a diver. This voluntary training, in addition to the hardship of boot camp, is considered as a kind of natural selection based on the will and motivation of the candidate to endure extra physical loads. Training is not the only thing done in boot camp; at the end of this period, the start of the selection process begins. After boot camp requirements and tests – which must be passed by all recruits – those interested in diving must wrestle through extra swimming, push-ups, sit-ups, pull ups and other tests.

A few years ago, the internal recruitment of divers – whereby active military in the Navy could become divers – was stopped. There is a possibility that this kind of recruitment will be reintroduced to supplement the recruitment during boot camp, should additional divers be needed.

After successfully passing boot camp and passing the medical section, the 'pool week' starts. This is a very intense in and under water training in the safe (all is relative of course) environment of the swimming pool. All dives are apnea dives with basic snorkeling equipment. The week serves to test the coolness and 'aquacity' of trainees underwater, even in stressful and difficult moments.

Pool week is the official start of diver training. The focus on education and training is one of the main differences between military and commercial diving. The possibility of encountering unforeseen, life-threatening situations during military action is much bigger, and a good way to increase the likelihood of surviving such a situation, is to train intensively.

To harness the expertise and experience into in-depth training, the U.S. Armed Forces have all divers trained at a sole diving school in Panama City, Florida.

From week 13 to 18 after the start of boot camp, the trainees are introduced to the art of surface supplied air diving. This is followed by 6 weeks of SCUBA diving courses wherein all theoretical and practical aspects are taught and trained. These two periods are known as the second class dive school.

After at least 6 years of being in the job, a diver can attend further training in the first class dive school. This is 9 weeks enrichment in surface supplied and SCUBA diving. Successfully ending this school gives a diver the credentials to take up the role of a supervisor.

The title of Dive Master can be reached after another 14 years of dive experience. Having achieved this level, the diver can become a dive officer, running a unit and leading the training of divers. This does not equal the qualification of an instructor, however, only providing the training necessary to sustain the level of performance of the divers in a unit.

All divers are trained in the use of air and Heliox. Nitrox is a possibility as a dive gas, but almost never used. The same is true for Trimix as warm water in a diving suit limits the positive effects of this mixture. Saturation diving is not common and limited to the 30 divers of the Experimental Diving Unit.

## SAFETY FIRST IN THE DAILY JOB

The work of a U.S. Navy diver can be divided into four categories. The first is submarine and ship's husbandry, and consists of commercial type maintenance work on all parts underwater. The second is Special Warfare in which the diver supports dive training of special operations personnel like Navy SEALs. The Navy divers working is this category do not go in operations themselves, but support the operators. Salvage divers, the third category, specialize in salvage operations and other tasks. The last category consists of EOD divers, who, as previously noted, deal with underwater ordnance disposal.

A diver starting in a category does not always have to stay in that category. On the contrary, during a career, the diver has to switch categories, a necessary condition to become a dive master. This broadens the diver's knowledge about diving in general, at the detriment of specialization.

Another difference with commercial diving is the credo 'Safety First'. From a military community you could expect a 'Mission First' approach, but not in the U.S. Navy. This kind of diving does not call for a combat approach,

although I suspect that in time of crisis that could change.

'Safety in numbers' must be the basic idea of the four person strong standard dive team. Planning and leading the team is in the hands of an experienced diver: the supervisor. Of course, there is the diver that has to do the job at hand. Supporting and aiding the diver is the tender. The fourth member of the team is the rescue diver, always ready to render assistance to the diver in case of dire straits.

Though the team may be the cornerstone of safe diving, procedures are certainly not neglected. Solo dives are never allowed. In case of potential danger like an EOD task, there is no use in risking the lives of two divers. Therefore an EOD diver will be tendered and is not considered a solo diver because the diver is able to communicate and the tender is able to keep a watchful eye on the events. When diving in pairs, the divers always use a floating buddy line. Work in enclosed spaces is not allowed. There must always be free access to the work spot. No dive starts without a decompression chamber nearby. There is also a limitation on the working depths: these conservative maximum depths are for air set at 190 feet (58 meters) and for Heliox at 300 feet (91 meters).

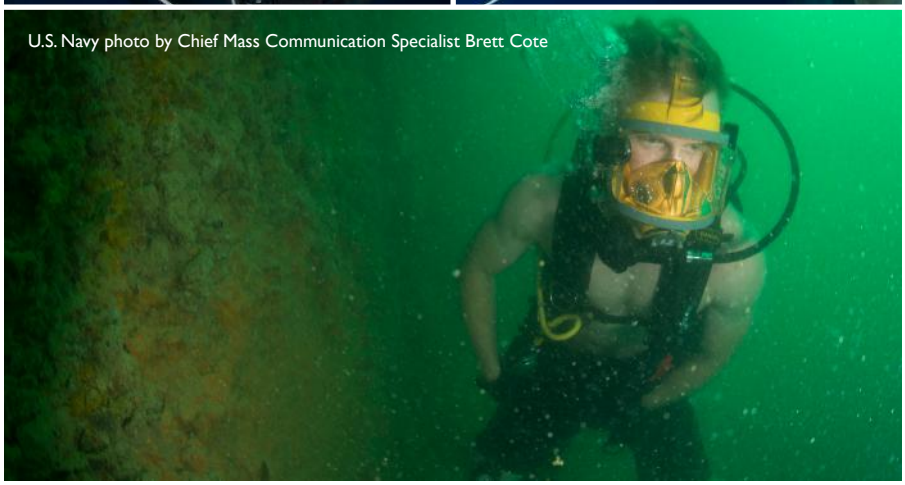
## THE FUTURE OF DIVE TABLES

In the early days, military diving led the market and certainly the development of new products. With only 1% of the market share, this is no longer the case. Most of the time, military diving has to follow the innovations of the commercial and leisure diving industry. This does not mean that the Navy allows the use of everything that can be found in a store. No, it keeps a close eye on what's out there and follows a rigorous testing scheme before releasing equipment to the Navy dive community (this list can be found online by searching 'dive equipment authorization military use' or www.supsalv.org/00c3_AMU.asp).

The widespread use of Remotely Operated Vehicles (ROVs) did not go unnoticed. Some of the tasks are now done by these underwater robots, but their use is not limited to that. They are introduced as an integral part of some dive teams. The ROV can join the diver for extra assistance and in a supporting role as a transporter. The robot gives the supervisor a better view of the situation and is the physical contact with the rest of the team at the surface. Having a better and closer follow-up of the diver is what the military is looking for on the market.

Another promising development is that of sensors. As sport divers, we saw the introduction of the heart monitor sensor to adapt our decompression scheme, but there are more possibilities out there. All kinds of sensors to monitor the diver's vital parameters could lead to timely warning of potential dangerous situations and better action in preventing negative outcomes.

U.S. Navy photos by Mass Communication Specialist 2nd Class Wyatt Huggett



U.S. Navy photo by Chief Mass Communication Specialist Brett Cote

As ROVs and other high tech equipment are adopted, one could expect that a more common and less technological element as the dive computer is standard equipment within the Navy. Although some types are allowed, they are not part of the basic equipment and there is no intention to change that. The dive community considers a dive computer as an extra check, but certainly not as the primary tool to plan and execute a dive. A dive is still planned as a no-deco dive based on the current U.S. Navy tables. The rare deco stops are preferably executed in a hyperbaric chamber. So a diver skips his deco stop to go straight into the safety of a chamber. This may sound very strange for a recreational diver as we see hyperbaric chambers as tools for treating the possible consequences of a dive that went wrong. The U.S. Navy considers the risks related to a diver at a wet deco stop much higher than a normal ascent combined with the comfort and level of control offered by a decompression in a caisson.

## EPILOGUE

After a few hours, the interview comes to the unfortunate and inevitable end. As I walk out of the building, I turn to have one last look at the "crab," the EOD warfare device so named for its resemblance to the small crustacean. I wonder if I've got all the important elements and if I will be able to integrate them into an article. The history and the influence of U.S. Navy diving in our world is too big to summarize in a few pages based on an interview. My hope is that I can transfer at least a bit of their heritage to you, my reader.

# SHARKS

## MONSTERS, MYTH, MYSTERY OR MAGICAL

## PART TWO

FEATURE **PAUL WARWICK** PHOTOGRAPHY **DR. RIMA JABADO – GULF ELASMO PROJECT**

Tagging a black tip reef shark (*Carcharhinus melanopterus*)

### DISTRIBUTION OF SHARKS

Sharks are found in waters throughout the world, from shallow water to the deepest parts of the ocean. Some species migrate vast distances, moving between various locations to breed and find the best sources of food. Some of these migrations are fairly easy to track. For example, every winter off the coast of Florida, Oceanic Blacktip Sharks head from the open ocean to the shore where they mate and breed. Thousands of these sharks migrate at once and come close to shore, making it easy for people to spot them and scientists to study them. But sharks migrating far offshore and traveling individually are more difficult to track, but modern tagging and tracking technologies are providing valuable information about their movements.

They will often place a computerized tag on the back of a shark that sends information about its GPS location back to the scientists on land. For example, it has been discovered that Great White Sharks have far more complex migration patterns than once thought, as they move throughout the Pacific in order to find food. New tagging and tracking technology has also allowed researchers to get a better idea of where the gentle Whale Sharks go after having gathered to feed on plankton off the coasts of Central and South America. Even so, new populations continue to be discovered, showing how much we still have to learn about the biggest of all sharks.

Several shark species also migrate between deeper and shallower water every day; these migrations are called "diel vertical migrations". The distance of these daily migrations range from 30 to 300 feet (tens to hundreds of metres) depending on the shark species. Blue Sharks for example, spend their nights near the ocean's surface (top 325 feet or 100 metres), but will dive down to depths of 1300 feet (400 metres) – and occasionally deeper to 1900 feet (600 metres) – and back to the surface throughout the day. One of the biggest changes when moving between depths is the temperature. In the blue shark study, water at the surface was around 79°F (26°C) and around 46°F (8°C) at 1300 feet (400 metres). That's a huge difference for a cold blooded animal and it's likely that the sharks are willing to put up with such cold temperatures in order to hunt deep water prey such as squids and octopods, and then return to the surface to warm up again. Other sharks like the Lesser Spotted Catshark spend their days in deeper water (65 feet or 20 metres), but swim to the surface at night, probably to keep warm

### ECO SYSTEM EFFECTS

Sharks can play a significant role in their respective ecosystems, no matter what their size or what their primary diet. Big predatory sharks require a lot of food, so the removal of too many large sharks can have a "ripple effect" on the populations of their prey: if you remove the sharks, too many prey are able to survive, and those then compete with one another (and other animals) for food, shifting the balance in the food chain, unless of course man then interferes to reduce the stocks of prey through overfishing?

One of the types of prey that can be greatly affected by shark removal is smaller sharks and rays. Often, large sharks are among the only animals that predate upon small sharks. And so when large sharks are overfished, there is sometimes an increase in populations of the smaller shark species. For example, as large sharks were fished out along the coast of New England USA in the 1970s, the catch of Dogfish (family Squalidae) increased fivefold in the 1980s suggesting that the Dogfish were able to thrive once their predators disappeared. But then, as fisheries went after dogfish at higher rates, their populations dropped in turn.

Large sharks also commonly prey upon sea turtles, seabirds and marine mammals; in fact, sharks are some of the few predators of large marine mammals. Because of this, their presence or absence can have a large effect on prey populations. The presence of Tiger Sharks

Pectorals in the front row and caudal fins in the back row

Juvenile tiger sharks (*Galeocerdo cuvier*)

Mako shark (*Isurus oxyrinchus*)

in Shark Bay, Australia, for example, changes the behavior of Sea Turtles, Dolphins and Dugongs, which avoid shark-infested waters even when food is in abundance.

One place where shark numbers have definitely decreased is on coastal coral reefs around the world. Healthy coral reefs far from human settlements have many sharks – far more than their top predator counterparts on land such as lions and bears. But when humans move in, sharks disappear, unless they are protected. A recent study found that in the Pacific islands, shark density is only 3-10 percent what it would be if no people lived in the area. Because humans have lived near reefs for so long, it's hard to know what these ecosystems should look like with a healthy number of sharks – and thus what effect the removal of sharks is having. Recent studies of remote uninhabited islands show that top shark predators outnumber their prey, in some cases making up 50 to 80 percent of the biomass on a reef! They are able to maintain this ratio because of the speedy transfer of energy up through the food chain.

## THE FOOD CHAIN

### FEEDING

Sharks are some of the predacious animals on the planet, far more so than any of their land based counterparts.

- **What they Eat:** You can find a shark that eats just about anything in and around our oceans and seas: the Whale Shark, the biggest fish in the sea, eats only tiny plankton, while Tiger Sharks have been found with license plates and nails in their stomachs. But most sharks are largely carnivorous and eat animals ranging from crustaceans (such as crabs) to squid, fish and marine mammals, such as seals and sea lions. Some sharks have even been found with giant squid beaks in their stomachs!

- **How they Eat:** Many sharks, however, have developed specific mechanisms that help them capture their prey. Some bottom dwelling sharks such as Wobblegongs (also called Carpet Sharks) hide and ambush their prey, sucking them up through small mouths. Some sharks swallow their prey whole, but others rely on very sharp teeth to break apart food – especially food larger than themselves. The Thresher Shark has a long tapered tail that is slaps into a school of fish to stun them and grab its meal. The Whitetip Reef Shark tends to hunt alone, sometimes chasing its prey into a crack and sealing the exit with its body. Saw Sharks, meanwhile, get their name from their saw-like snout that is used to scrape up invertebrates from the seafloor and to stun fish. There are also some large species of sharks that are plankton feeders. The Basking Shark, Megamouth Shark and Whale Shark all consume the tiny crustaceans. Their teeth are small and they have modifications on their gills that act like sieves to capture the plankton so they can swallow them in large gulps.

### PREDATION ON SHARKS

Large sharks have few natural predators besides other sharks (and man!), although some small juvenile sharks are eaten by birds and large fish. Sharks are primarily killed by humans both intentionally and unintentionally as bycatch. Because of sharks slow growth and low reproduction rates, the rate at which humans are killing sharks is endangering shark populations and ecosystems throughout the world. Having said that, sharks have no natural predators apart from themselves and man, there have been recorded instances where sharks have been actively hunted, corralled killed and subsequently eaten by Killer Whales. Although rare, could this be that sharks are no longer, "top of the marine food chain"?

### THREATS

It is an undisputed fact that sharks are in trouble around the world – some species more than others. Whether this has been to provide culinary delicacies for the rich and affluent, or holistic medicines for the Asian markets,


or in the name of sports fishing, or through ignorance and greed by the international commercial fishing industry. Whatever the reason(s), sharks have become the principle marine, "target of opportunity" for a very prosperous and thriving commercial and black market, mainly as a result of the huge sums of money which exchange hands for "parts" of these incredible animals.

**It is principally Asian markets which drive the demand for sharks, and specifically their fins:**

- Historically, shark fin soup was only affordable to the richest people, but as the middle class has grown, it has become a more mainstream menu item. The targeted shark fin fisheries around the world are trading the fins of between 26 to 73 million sharks every year, with a net worth of over $400-550 million. Driving this trade, is the demand for, and the consumption of shark fin soup, despite the fact that the fins add no flavour, or texture, or nutritional value whatsoever to the broth.
- Some shark meat is eaten as a byproduct of the finning and to justify the catch! In poorer Asian countries, it is a prime source of protein and a byproduct of the richer countries demand for the fins!
- Asian traditional medicine(s) call for dried shark fins to be used in holistic and complementary therapies, which again have no objectively proven medicinal benefits although it is accepted that our oceans and seas may possess curative medicinal compounds which have yet to be discovered.

Most sharks are humanely killed, but many have all their fins cut off whilst still alive and are then thrown back into the ocean (to save space on board for the more valuable fins) to drown – a practice euphemistically known as shark "finning". This practice is increasingly seen as cruel and wasteful, and around the world, regulations are being put into effect to end shark finning. Have you ever seen pictures or videos of a shark being "finned" alive and then cast back into the oceans and seas to drop to the seabed where they suffocate and die because they cannot force water through their gills to breathe? These are living animals that are abused in the name of greed.

Sharks are accidentally caught in nets or on long line fishing gear as bycatch. And because of the needless fear spurred on by films such as Jaws, the instinct for some is to hurt or kill sharks that come near – such as the controversial shark culling in Australia and the unregulated and ill-informed reaction to any shark attacks. Combined, these actions have decreased many shark populations by up to 90 percent since large scale fishing began over 50 years ago.

All of this puts these incredible animals – and the ecosystems in which they play a role – in jeopardy. To protect them, communities and companies around the world are enacting science-based fisheries management policies, setting up shark sanctuaries, and banning the practice of shark finning and the trade of shark fins.

## CONSERVATION

It is estimated that 80 – 100 million sharks are killed every year by commercial and recreational fisheries, both legally and illegally. Until recently, both fishermen and governments did not capture official records and information on shark catches. Instead of reporting shark catches by species, they would report all sharks collectively or even group sharks and rays together. That made it difficult to determine how many sharks were being fished historically. As a result of this unrestricted and unmanaged slaughter, it is estimate that 25% of all shark species, along with their ray and chimaera relatives, are threatened with extinction according to the International Union for Conservation of Nature (IUCN) Red List criteria.

Sharks are particularly vulnerable to overfishing. They grow slowly, reproduce late compared to other species of fish, and do not produce many offspring at a single birthing.

Pregnant females in the catch. Pups with umbilical cords attached.

Combined, these traits make them slow to replenish their populations when they are fished or otherwise killed at such rapid rates. A recent study comparing sharks with other large bony fish, found that sharks have more than twice the risk of extinction than any other species.

Some sharks are caught by fisheries targeting sharks specifically. Not all are caught intentionally, however. Sharks are often caught as bycatch (which means that, while the fishermen were trying to catch a different kind of fish, they accidentally catch sharks in their nets too). Some bigger open ocean swimming sharks are caught by longline fisheries aiming for big fish such as swordfish or tuna. For example, large shark abundance decreased by 21 percent in the tropical Pacific after industrial fishing began in the 1950s. The 90 percent of elasmobranchs (sharks, skates and rays) that live near the seafloor are particularly susceptible to fisheries that drag a net across the ocean bottom (trawling). This can change local shark populations dramatically. For example, between 1972 and 2002, after shrimping began in the Gulf of Mexico, some populations of shallow water sharks and ray species dropped by up to 99 percent. Such a big change doesn't just affect the sharks, but also their prey and the rest of the ecosystem.

## SHARK PROTECTION

Shark populations have been in trouble for decades due to overfishing. In 2009, the International Union for the Conservation of Nature (IUCN) reviewed the status of 64 species of open ocean sharks and rays and found that 32 percent were directly threatened with extinction. Governments and Non-Governmental Organisations (NGOs) and the commercial sector were called upon to meet a list of conditions to preserve and restore the species which included:

- Increasing protections of sharks through science based catch limits.
- End shark finning completely.
- Improve monitoring and research.

## INTERNATIONAL EFFORTS

International efforts and national efforts to control the overfishing of sharks and the trade in fins has been slow to materialise mainly due to the lack of verifiable information and the fact that many species of sharks are migratory and move around the world's oceans outside any protective measures which could be afforded by national boundaries. One of the major steps has been to actively pursue the reduction in demand for shark fins and shark products. This has been a major success as a result of education, advertising and political decisions in many Asian markets. It has taken a sustained effort by the world's marine scientific community, marine conservation groups and "pressure groups" to initiate this "step change" in attitudes which have been supported at the highest levels of Government and Enterprise.

Having said the international community was slow to react, is not strictly true. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) recommended that the Food and Agriculture Organization (FAO) of the United Nations establish a method to maintain biological and trade data on sharks in order to curb their over-exploitation. This led to the creation of the International Plan of Action for the Conservation and Management of Sharks (CMS). Countries that are a party to the United Nations participate in the International Plan of Action voluntarily.

The European Union (EU) collectively as a result of direct action and pressure by Conservation Groups has signed up to CMS and introduced appropriate and binding legislation which covers the exploitation of sharks, the protection of endangered shark species and the trade in all shark products within EU territories. Again a major step up in the recognition of the plight of all endangered marine species, including those which used to provide a livelihood in fishing for may EU residents.

## NATIONAL EFFORTS

Individual countries around the world have taken steps to protect sharks in the form of fishing regulations, shark finning bans, sale and trade bans, transport bans and shark sanctuaries where no (or limited) shark fishing is allowed. Regional fisheries management organizations, such as the Northwest Atlantic Fisheries Organization (NAFO) and the International Commission for the Conservation of Atlantic Tuna, manage fish species that travel between international lines. They have various shark finning prohibitions and regulations among 17 geographic regions worldwide.

**The USA was the first to act unilaterally on a national basis:**

- Shark finning has been officially banned since 2000 when the Shark Finning Prohibition Act banned the catching, possession or transportation of sharks fins within 200 miles of its coastal waters. Numerous "loopholes", which organisations and individuals exploited to continue the trade in both sharks and fins, were closed in 2011 when the Shark Conservation Act passed into law. This banned shark finning, the possession or transfer of fins and the landing of any shark without its fins "naturally attached." The Shark Conservation Act did not however specifically address the trade of shark fins once they were caught. The State of Hawaii was the first US state to ban the possession, sale and trade of all shark fins, and was quickly followed by a handful of other states on both the east and west coasts.
- In addition to finning bans in the USA Federal and State laws, shark populations are managed under the National Marine Fisheries Service in Regional Fisheries Management plans. These plans reflect the results of research, population assessments and work with fishermen. Additionally, two populations of Scalloped Hammerhead Sharks were listed under the US Endangered Species Act in July 2014, making them the first sharks to be protected under the law.
- Reducing the accidental catching of sharks as bycatch has also been an important goal. In California, for example, the banning of nearshore gillnets has reduced shark mortality. Similarly, changes in hook and fishing line design make it easier for sharks to escape and improve their ability to survive after their release when they are caught by mistake.

Palau became the first country to implement a shark sanctuary in 2009, banning all shark fishing in its 240,000 square miles of territorial water. Many countries have followed suit with various levels of protection. The Chinese government will no longer serve shark fin soup at official functions, and a number of hotels and supermarkets have pledged not to sell or serve shark fin products. Even some airline companies are banning the transport of fins on their planes.

## SHARKS AND THE UAE

There are over 31 recorded species of sharks which either inhabit or transit through the Arabian Gulf and the waters around the UAE, from the large pelagic species such as Whale Sharks, the Great Hammerhead Shark, Bull Sharks, Oceanic Whitetip Sharks to the smaller varieties of coastal shallow water sharks such as the Bamboo Shark, Silky Shark, Milk Sharks and the Spottail Shark. Many have been the target of fishermen for whom the shark meat has been a bycatch of the far more lucrative fins which they have been able to sell on the open market – until now. Definitive action by the Ministry of the Environment and Water now actively supports the work of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species (CMS). In February 2014 the UAE, along with seven other Arab countries, signed the Memorandum of Understanding (MOU) on Conservation and management of Sharks (CMS) which currently has the written support of the entire European Union and 26 other countries worldwide.

**Since July 2014, the UAE has enacted National Legislation which:**

- Bans the export of ALL shark products from sharks caught in UAE waters.
- Placed major restrictions on the annual shark fishing season to avoid migratory periods.
- Extended the designated zoning of fishing grounds.
- Stipulated the types of fishing equipment which can be used.
- Directed the release of protected species of sharks caught as bycatch out of season.

In addition, having been the fifth largest exporter of shark fins in the world after countries such as Indonesia, Taiwan and Spain, the UAE is now at the forefront of the region's measures to restrict the trade in all shark products no matter where they originate. National Decrees now severely restrict the passage of all shark products through the UAE and place definitive legal, scientific, commercial and moral responsibility upon those who deal in this trade. As a first step, this is a major accomplishment, but more needs to be done to actively protect sharks in the region and conserve them as part of the UAE marine heritage.

## SO WHAT NEXT?

Species are disappearing from our natural environment every single day, some are simply unable to adapt or evolve to our ever changing world whilst others are simply hunted to extinction or displaced from their natural habitat(s) by man's unrestricted activities. Conversely new species are also being discovered all the time in even the remotest and hostile of environments. Whilst the destruction of habitats is undoubtedly the greatest threat to all flora and fauna, the destruction of marine bio-diversity is perhaps the greatest single threat not only to our natural world, but to humanity itself. We are all "linked" through evolution and the common factor is water – it is this which "binds us" to all living things. If we as human beings know anything instinctively, it is that nature is all about "balance", upset the balance and the results can be unforeseen and catastrophic.

The one thing we humans are really good at, is "hindsight" – "if we had done this or if only we had done that" and generally we realise too late to have any real profound effect on the situation we ourselves have normally created. The future of sharks, especially the bigger migratory species, is at a critical juncture, we cannot go on hunting these animals in the name of luxury and affluence. It has been proven that they are critical to the health and wellbeing of our oceans and seas and the maintenance of both biodiversity and balance within the various ecosystems. To say the health and cleanliness of our oceans is critical to our continued existence is not an overstatement; we totally rely on the oceans and seas huge contribution to water, carbon and oxygen cycles of our water world which drives climate, temperature and weather, as well as the quality of our life giving air.

Let us protect and manage our oceans and seas, and the life that lives in them as a way of life not a chore, otherwise animals such as sharks will just become creatures of myth, we will lose the magic of their predatory magnificence and mystery of their life cycle and interaction in our oceans.

**"Always Keeping the Fun in Diving"**

Sandbar shark (*Carcharhinus plumbeus*) being measured and tagged. Photo by Jon Farrer.

# SHARK SHEPHERD

FEATURE AND PHOTOGRAPHY **BENJAMIN VON WONG | WWW.SHARKSHEPHERDS.COM**

"Sharks are almost always depicted as menacing and terrifying, yet it is humans that are responsible for killing them in the millions just to make soup. I wanted to create a series of images that would help break those stereotypes and show that it is possible for us to co-exist together in perfect harmony."

Fiji is known to ecotourists around the world for its world-class shark dives.

As a photographer looking to create meaningful work, this was the perfect opportunity for me to create a series of images that would promote their beauty while advocating for their protection.

Sharks are almost always depicted as menacing and terrifying, yet it is humans that are responsible for killing them in the millions just to make soup. I wanted to create a series of images that would help break those stereotypes and show that it is possible for us to co-exist together in perfect harmony.

Finding a dive shop that would be interested in helping me transform my vision into reality was a huge challenge. Not only did they have to be available, they also had to believe that creating a shot like this would be possible. Although there was some interest, it wasn't until a few days after I landed in Fiji that things started to fall into place.

Through the help from a couple of supporters, Ropate and Konrad, along with a half-dozen emails and phone calls, I was finally introduced to the right people: Tourism Fiji and the Barefoot Collection. Despite the tight time frame, they provided us with a full team of support divers, including their in-house marine biologist and shark expert, Thomas Vignaud. Just like that, we found ourselves creating a shark shepherd to promote shark conservation.

Shooting a model with sharks was even more complicated than shooting models in an underwater shipwreck.

In addition to the standard complications of shooting underwater – Limited oxygen, complex communication, specialized equipment and experienced divers – we only had a tiny two-hour window slot each day, between 11am and 1pm, where the sharks would be active and light rays visible.

For each and every shot, we had to weigh Amber Bourke down – our champion freediver – onto the perfectly lit rock formation where light was falling. The ethereal white dress, designed specifically for this shoot by Ali Charisma, had to be carefully placed so that it would flow beautifully into the image. When all was finally in position, we would hand over the three-piece plastic shepherds crook to Amber, and begin the wait.

Over the course of three days, we waited over six hours.

Though popular media would have you believe that sharks come swarming at the slightest scent of blood, death and suffering, our experience with them was the complete opposite.

Similar to squirrels at a park, the white tipped reef sharks would hover around us curiously, only to scamper off if anyone got too close.

Hoping to get the sharks in perfect position, our entire team tried their best to hug the walls and not make any sudden movements to not startle the timid creatures.

Once one of them got deep enough into the cave and we thought there was a good chance of us capturing a shot, Amber would take a deep breath, rip off her mask and strike a couple of poses for as long as she could.

Having the privilege to dive with sharks, learn more about them and showcase their unique beauty, was one of the most amazing experiences that I have ever had the opportunity to be a part of. Although sharks are currently on the road to extinction, it is still possible to find pockets of magic such as these.

I hope that everyone gets the chance to experience their grace in person – but until then, join me in encouraging the creation of shark sanctuaries by signing this petition.

**GEAR USED:**
Sony A7r-ii, 16-35mm – Nauticam Housing + 180mm Dome Port

**THE PROJECT'S CREW:**
**Photography:** Von Wong
**Video Editing:** Adam Frimer
**Sound Design:** Andrew Kesler
**Model:** Amber Bourke
**Dress Designer:** Ali Charisma
**Underwater Video Operator:** Steve Hathaway – Young Oceans Explorers
**Drone Operator:** Joost Glaser
**Shark Expert:** Thomas Vignaud
**Dive Team:** Lydia Murray, Kris Mcbride, Rachel Young, Carlo Acosta
**Special Thanks:** Barefoot Collection, Tourism Fiji, Nauticam
**Screenwriting:** Yonatan Kanaskevich
**Copywriting:** Marlies Gabriele Prinzl
**Conservation Partner:** Shark Stewards

**LINKS OF INTEREST:**
- Sign the Petition
  **www.sharkshepherds.com**
- Benjamin Von Wong Photography
  **www.vonwong.com**
- Conservation Partner
  **www.sharkstewards.org**
- Sharks are Worth more Alive than they are Dead
  **http://is.gd/XtwrkX**
- Why Sharks Generate more Money Alive than Dead
  **http://is.gd/JxQHFq**

# INTERNATIONAL SUPPORT FOR MASIDI & THE CREATION OF A MALAYSIAN SHARK SANCTUARY

## THE PETITION AT CHANGE.ORG

Sharks generate more money alive than dead for local communities.

Well designed, administered and enforced Marine Protected Areas have been scientifically demonstrated across the globe to benefit fish and marine ecosystems. While the fins from a dead shark may be worth US $100 to a local fisherman, through ecotourism, a living shark can support an entire island community and its surrounding ecology by bringing in over US $1.9 million over the course of its lifetime.

Together with Shark Stewards, an organization dedicated to combatting the shark fin trade, we are collecting signatures from the online community to prove to governments and organizations that travelers have a tangible interest in seeing sharks alive.

We hope to begin saving sharks in my parents home country of Malaysia, in the heart of the coral triangle.

Ecotourism is a major economic product of Malaysia and has increased over 20% in 2015 alone. Surveys among dive tourists indicate they will pay more to dive with sharks and big fish. Without healthy sharks, sea turtles and reefs, the dive business in Malaysia is likely to decline, and local communities will suffer economic loss and ecological destruction.

Saving sharks would not only help revitalize the ocean ecosystem but could open up an entire new industry of dive ecotourism.

Shark Stewards have successfully combated the shark fin trade and implemented shark conservation policies including the ban of shark finning, and the regulation of the shark fin trade in the USA and the Pacific Rim.

With your support and your signature, we hope to support Masidi Manjun in his efforts of creating shark sanctuaries in Malaysia.

## FIVE SHARK FACTS:

1 Sharks are a keystone species and are responsible for the health of ocean ecosystems. They eliminate the weak, the diseased and the dead, maintaining the ecological balance and the future health of the ocean.

2 Every year, tens of millions of sharks are killed by humans. On average, sharks kill less than 10 people a year.

3 Shark fins contain mercury and have nearly no nutritional value. Most shark meat is unpalatable. It is mostly eaten as a status symbol by the Chinese.

4 Currently, shark ecotourism brings almost US $1 Billion worldwide, and is expected to grow twofold over the next twenty years.

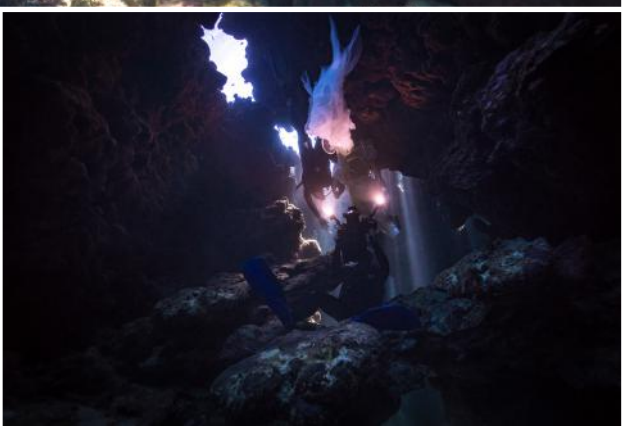
5 There are over 450 species of sharks, most cause no harm to humans.

Saving sharks will help save the ocean and the future of ocean and human health.

The ocean needs our top predators.

Let's start at the top, by fighting to save them.

**Sign the petition here:** www.sharkshepherds.com
**Or scan the code:**



# ENTER DIGITAL ONLINE 2016

## EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION

**SUBMISSIONS OPENED:** SUNDAY, 3rd JANUARY 2016 | **SUBMISSIONS CLOSE:** THURSDAY, 28th APRIL 2016 @ 11:59 PM (GST)

**AWARDS & EXHIBITION NIGHT:** WEDNESDAY, 25th MAY 2016 | 19:00-22:00 | AUD

**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 (both professional and amateur).
- To discover new promising underwater photographers in the UAE.

**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.**

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

Digital Online was realised in 2009 by Marcelo Mariozi, a professional underwater photographer who had previously been involved in the organisation and set up of underwater photography competitions in his native country of Brazil.

As there were no underwater photography competitions existing in the UAE at the time, Digital Online was introduced by EDA for resident photographers to develop a relationship and human interaction with those unfamiliar with the underwater world and environment.The film category was introduced as an extension to the competition in 2012 to share our underwater world through motion pictures.

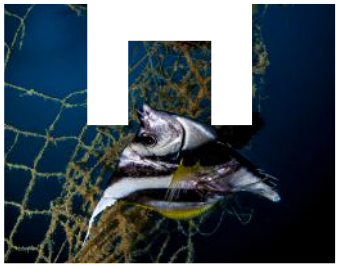
The event now in its eighth year, has seen the steady growth of underwater photography participation, the enthusiasm, and the passion step up to another level.The event has attained equal success within the non-divers who come to support the participants at the Awards and Exhibition night.

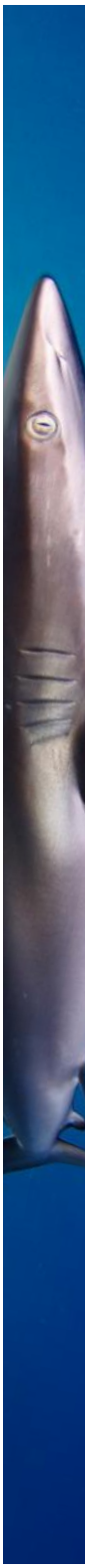
We would like to thank all our devoted and new sponsors for all their wonderful prizes for 2016; Canon, BFC Travel Management, Tourism Malaysia, Al Marsa Musandam, Grand Stores, Anantara Sir Bani Yas Island Al Sahel Villa Resort and Al Mahara Diving Center, Le Meridien Al Aqah Beach Resort Fujairah, Millennium Resort Mussanah Oman and Oman Sail, Nomad Ocean Adventures, Atoll Scuba, The Dive Centre, MTM Marine LLC, The Pavilion Dive Centre and Al Boom Diving.

We would like to thank our printing sponsor, Print Works who provide all the prints for the Digital Online exhibitions each year and a big thank you to the American University in Dubai (AUD) who will be hosting the event for the third year running in their Rotunda Gallery.

We would also like to thank Imran Ahmad, Nuno Sá, Jonathan Ali Khan and Christophe Chellapermal for being Digital Online's asset guest judges. We are privileged to have such amazing people and photographers/film makers be a part of this event.

Digtial Online 2015 Winners and Sponsors





## 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 renewed if expired or acquired in order to take part.
- 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 share respect for the underwater world during the process of taking their stills and video. Be advised that any damage to the protected underwater world, including the disruption of the natural habitat of the marine life, provocation through touching, displacing, feeding or annoying, is prohibited and will disqualify the images or the photographer/videographer.

## ADDITIONAL RULES

- 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 winning images in the 'Divers for the Environment' magazine, EDA's social media pages and on the EDA website. Winning 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.
- Competition organizers will take the utmost care in handling digital files submitted to the competition. However, competition organizers will not be held responsible for any loss of the submitted material at the time of uploading images. No media such as CD's, DVD's, memory cards and sticks will be returned to the participants.
- Images (photos or videos) must not have already been submitted to previous Digital Online Competitions.
- Photos and videos must be taken underwater unless specified in a category description.
- Manipulation is restricted to colour correction, brightness, contrast, sharpening and cropping. The Digital Online judges reserve the right to examine untouched images 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.
- The deadline for all entries is Thursday, 28th April 2016, at 11:59pm (GST – Gulf Standard Time).
- The finalists will be announced and their work displayed at the Award Night and Exhibition opening on Wednesday, 25th May 2016 at the American University in Dubai (AUD). Participants who do not make it to the evening of the event will be asked to collect their prizes from the EDA offices.
- 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 judge's decisions are final.

## REGISTER & UPLOAD ENTRIES

- Registration and submission entry was open from Sunday, 3rd January 2016 and the final deadline is on Thursday, 28th April 2016, at 11:59pm.
- The participant must have valid EDA membership. Submit entries via email to **photo@emiratesdiving.com** with the category information requested below.
- File names should include photographer's name and the category. (eg. TSmith-Macro.jpg, TSmith-WideAngle.jpg, TSmith-BestoftheUAE.jpg, TSmith-Black&White.jpg, TSmith-Compact.jpg).
- 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 AdobeRGB 1998 or sRGB colour space.
- Video submissions must be in mp4 format and can be sent via WeTransfer or Dropbox with file name of the Videographer.
- The preferred method of entry is electronically, however, if this method is not possible due to lack of proper internet connection, you are able to submit via DVD, memory card or stick. Please note, media will not be returned.
- You will receive an email to confirm your registration and photo/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 2016! 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 photograph's 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.

## PHOTOGRAPHY CATEGORIES

Photographers may enter one photo per category.

Information to include with each photo submission:

- Photographer Name
- Category
- Location
- Story behind the Shot
- Camera Gear
- Settings

1. **MACRO** (DSLR/MILC ONLY)
   **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** (DSLR/MILC ONLY)
   **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** (DSLR/MILC AND COMPACT)
   **Definition:** Any underwater subject taken in the UAE and the Musandam.

4. **BLACK & WHITE** (DSLR/MILC AND COMPACT)
   **Definition:** Black and white photography is timeless and elegant. Focus on tonal contrast, shapes and textures and the composition of the shot.

5. **COMPACT CAMERA** (COMPACT ONLY)
   **Definition:** Point & shoot photographers only. Any subject of choice.

## VIDEO CATEGORY

BLUE OCEAN

**Definition:** Looking for films of all genres – documentaries, narratives, shorts and animation films. Film subject must focus on all aspects of our blue ocean including but not limited to, ocean exploration, wildlife, environmental, conservation and oceanography. Lengths including credits: 5 minutes or less.

- 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.

# DIGITAL ONLINE 2016 SPONSORS AND PRIZES

EVENT BY EDA

EDA
جمعية الإمارات للغوص
Emirates Diving Association

EXHIBITION VENUE

AUD | AMERICAN UNIVERSITY IN DUBAI
School of Architecture, Art and Design

PRINTING SPONSOR

PRINT WORKS

PRIZE SPONSORS

BFC TRAVEL MANAGEMENT · TOURISM MALAYSIA · It's more fun in the Philippines · AZURE DIVE & YOGA RESORT · AL MARSA Musandam · Canon · Grand Stores · Le MERIDIEN AL AQAH BEACH RESORT FUJAIRAH · AL MAHARA DIVING CENTER · ANANTARA · MILLENNIUM RESORT MUSSANAH · SEAOMAN Discover, Explore, Experience · OMAN SAIL · NOMAD OCEAN ADVENTURES · ATOLL SCUBA · MTM Marine LLC · Al Boom Diving · iQ-UV www.iq-uv.com

Digital Online's 20 Prize Sponsors are giving this year's lucky winners 28 prizes to choose from!
**Note:** Participants are only able to win one prize or prize package each. Entrants with multiple winning entries will be given priority in the points awarded.

**1.** BFC TRAVEL MANAGEMENT (3 packages sponsored)
1. Destination Package – 5 days/4 nights in Bali, Indonesia.
2. Destination Package – 4 days/3 nights in Terengganu, Malaysia.
3. Destination Package – 4 days/3 nights in Aqaba, Jordan.
Includes the accommodation, breakfast, diving (2 days), airport transfers and transportation between dives for one person.

**2.** TOURISM MALAYSIA
Destination Package – 5days/4nights to Sipadan, Malaysia.
Includes one domestic return Economy Class ticket for KUL/Tawau/KUL, accommodation on full board basis, return ground & boat transfers (Tawau/Semporna/Mabul), and 2 days of diving excursions for one person. Does not include, weight, belt and tank rental, or the Sipadan permit fees.

**3.** PHILIPPINES DEPARTMENT OFTOURISM (2 packages sponsored)
1. AZURE DIVE & YOGA RESORT
Destination Package – 5 days/4 nights superior deluxe accommodation for one person in Dumaguete, Philippines.
Includes complimentary breakfast and 6 fun dives.
www.azuredive.com

2. MARCO VINCENT DIVE RESORT
Destination Package – 6 days/5 nights with breakfast and 12 guided dives for one person in Puerto Galera, Mindoro, Philippines.
Not included: nitrox use, equipment rental or transfers to the resort.
www.marcovincent.com

**4.** AL MARSA MUSANDAM
2 Night Liveaboard Trip in the Musandam
Includes all meals, tea, coffee, water and soft drinks, 6 dives, tank and weights, diving equipment, kayaking and fishing.

**5.** CANON (3 prizes sponsored)
1. Powershot G7 X
2. EOS 700D + 18-55 DC
3. Powershot D30 (Underwater Camera)

**6.** GRAND STORES (2 prizes sponsored)
1. [Qudos] Action Light by Knog
Waterproof up to 40m, 3 light modes with 70-400 lumens. Pairs with GoPro and comes with a cold shoe accessory for DSLRs.

2. Rollei Actioncam 7s WiFi
Powerful 16 Megapixel WiFi Action Camcorder with convincing 4K 12fps Video Resolution (4096x2160 pixels).

**7.** ANANTARA SIR BANI YAS ISLAND AL SAHEL VILLA RESORT & AL MAHARA DIVING CENTER
Two nights stay at Anantara Sir Bani Yas Island Al Sahel Villa Resort in a one bedroom villa for 2 with sumptuous breakfast in the Savannah Grill restaurant and 2 dives (tank & weights included).

**8.** LE MERIDIEN AL AQAH BEACH RESORT AND SPA (2 packages sponsored)
1. Weekend night stay in a Superior Room inclusive of Breakfast Buffet for two at Views Restaurant.
2. Summer Promotion – 2 night stay during summer months in a Superior Room with Breakfast Buffet for 2 at Views Restaurant.

**9.** MILLENNIUM RESORT MUSSANAH AND OMAN SAIL DIVE CENTRE, OMAN
2 night stay for two adults in Superior Room, room only basis, valid from 30th April until 30th December 2016 with 2 tank dive package.

**10.** NOMAD OCEAN ADVENTURES (4 prizes sponsored)
1. Underwater Photography book by Tobias Friedrich.
2. TDI Advanced Nitrox Course in Fujairah.
3. TDI CCR Air Diluent Diver Course in Musandam, Oman.
4. 2 days/2 nights, chalet package (4 dives) for 2 in Musandam, Oman.

**11.** ATOLL SCUBA
A package of 10 dives with Atoll Scuba on the island of Rasdhoo in the Maldives for one diver.
www.atollscuba.com

**12.** THE DIVE CENTRE (2 prizes sponsored)
1. One complimentary dive from Dubai or Fujairah dive centre.
2. One complimentary dive from Dubai or Fujairah dive centre.

**13.** MTM Marine LLC (3 prizes sponsored)
1. Mares Abyss 22 Nitrox Din Regulator
2. Mares Dragon AT BCD
3. Mares Cruise Captain Bag

**14.** THE PAVILION DIVE CENTRE
PADI Divemaster Course.
The crewpack and PADI membership fee are not included in the package.

**15.** AL BOOM DIVING
Voucher for 2 dives on East Coast with full equipment for one diver.

**THE PEOPLE'S CHOICE AWARDS PRIZE SPONSOR**
**16.** iQ-UV (3 prizes sponsored) UV Protection you Wear | www.iq-uv.com

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

# DIGITAL ONLINE JUDGES

## IMRAN AHMAD | PROFESSIONAL PHOTOGRAPHER

Imran Ahmad Photography and ESCAPEINC Dive & Photography

Imran Ahmad has been capturing the magnificence of life both above and below the water's surface for over 20 years. A celebrated and internationally published professional photographer, Imran is committed to showcasing, preserving and protecting the ocean's environment and its surroundings. Clients can find photographic solutions for corporate, commercial, wildlife, creative arts, publishing, photo clinic and underwater projects. A graduate from Middlesex University with a Bachelor of Arts in Film making, he is the brand ambassador for RGB Lights (Japan), and a member of the Ocean Artist Society.

**PUBLISHED BOOKS**

Seychelles Unexpected Treasures (Underwater Photo Art)
Ocean Tapestry (Underwater Photo Art)
Hidden Sanctuary (Mabul & Sipadan Underwater Look Book)
PURE Series

**WEBSITE:** www.escapeinc.com.sg
**FACEBOOK:** Imran Ahmad Photography

## NUNO SÁ | WILDLIFE PHOTOGRAPHER

Professional Photographer Specializing in Marine Life

Nuno has been a professional photographer since 2004, specialized in marine life photography. He is the author of three books and several dozens of articles published in National and International magazines. He is the co-author of the "Azores Diving Guide" – Portugal's first published diving guide, and a regular collaborator of several magazines, such as National Geographic Portugal.

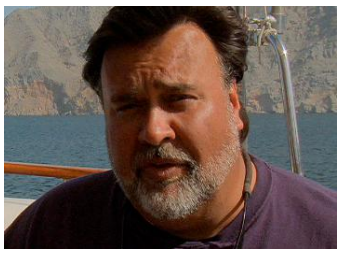
He is the first Portuguese wildlife photographer nominated in some of Europe's major nature photography competitions, such as: Wildlife Photographer of the Year and Asferico International Nature Photography Competition, amongst others.

Nuno is also on the Wild Wonders of Europe's team of top European nature photographers. This is the world's biggest ever nature photography project with an expected public of over 100 million people, a project supported by the National Geographic Society.

**WEBSITE:** www.photonunosa.com

## JONATHAN ALI KHAN | WILD PLANET PRODUCTIONS

Managing Director – Natural History TV Production, Underwater filming specialists, video production and photography.



JAK is a topside wildlife and underwater camerman, producer, director and editor with a strong passion for the natural world having worked on a wide range of unique projects in the region and is recognized as an authority on environmental, conservation and diving related issues.

His fascination with filming all started after years of working as a photojournalist and shooting underwater stills. His primary interest is in marine subjects that led to the creation of Ocean World Productions in 2003. In 2008, JAK left Ocean World Productions in order to focus entirely on natural history TV development, leading to the recent creation of Wild Planet Productions.

**WEBSITE:** www.wildplanetfilms.org
**FACEBOOK:** Wild Planet Productions

## CHRISTOPHE CHELLAPERMAL | PADI & TEK TDI REBREATHER INSTRUCTOR

Founder and Owner of Nomad Ocean Adventures

Christophe Chellapermal arrived in the UAE when he was 7 years old and has been living in the Middle East region ever since. His love of water started as a young child and he has been a diver since he was 12 years old. Chris became a PADI Scuba Instructor in 1998 and with 25 years of diving experience and 17 years of teaching experience, he has gained much knowledge in the aquatic realm. He is a TEK TDI Rebreather Instructor with Submatix and can teach CCR up to 60m. Founder and owner of Nomad Ocean Adventures since 2004, he loves the ocean and the planet and does all he can to involve Nomad Ocean Adventures with environmental conservation. Being a photography and nature lover, he spends hours in the water taking photos of his underwater adventures.

**WEBSITE:** www.discovernomad.com
**FACEBOOK:** Nomad Ocean Adventures Musandam

## ALLY LANDES | EMIRATES DIVING ASSOCIATION

Events Coordinator, Editor, Graphic Designer, Photographer and Videographer

Ally has worked with EDA since December 2004 when she created and introduced the quarterly magazine, 'Divers for the Environment', as magazine Producer, Editor and Designer.

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 keeps busy within her fields of passion, always looking to fill gaps with improvements, developing EDA's brand, designs and managing all the EDA social media and FAM trips.

As a qualified PADI Instructor, she utilizes the experience within everyday life at EDA.

# A LONG WEEKEND IN PARADISE

FEATURE AND PHOTOGRAPHY **SIMONE CAPRODOSSI**

Beautiful accommodation, caring staff, fantastic diving, friendly turtles, amazing stingrays, stunning sunsets, perfectly white sandy beaches and turquoise blue waters make the Maldives an enjoyable and relaxing long weekend destination with some great diving to boot!

One of the many perks of living in Dubai is easy access to some beautiful tropical locations for a long weekend; which makes friends back in Europe very jealous, especially during November! In October last year, Emirates Airlines launched a promotion to fly to the Maldives for only a handful of air miles, and unable to resist, we booked a last minute trip.

The flight left Dubai at 2:45am on a Friday morning, and we were lying on the idyllic beach by 10am. It's a long night of traveling, but by choosing a resort in the Male Atoll that can be reached via speedboat, the connection is very quick. We treated ourselves to a stay at Jumeirah Vittaveli, a wonderful 5-star resort on Bolifushi Island in the South Male Atoll. Jumeirah has a welcome room in the small Male airport, so once through arrivals, you are taken care of all the way to the luxury speedboat transfer. After a pleasant 30 minute ride, we were sipping our welcome drink on the islands pier.

Bolifushi is a long, thin island with beach villas on both sides. Water villas on the lagoon and 12 ocean villas that beautifully dot the horizon which are only accessible by boat.

We checked into a beach villa on the sunset side of the island. All the villas are private with their own beautiful swimming pool – just incase the turquoise sea ever gets boring; the temptation to stay in the villa is extremely high.

We planned to stay for four days, allowing for a first and last day of relaxation and snorkelling on the house reef, and two days of diving.

As the island is quite long, all guests are given bicycles so that they can move quickly from one side of the island to the other. After a relaxing first morning, lunch and then a quick nap to recover from the flight, we cycled over to the dive centre which is a good three-minute cycle away. When we arrived, Johan the dive centre's manager welcomed us, we then discussed our two-day dive plan and sorted our dive gear out. Having only four dives to do, we agreed to experience the reefs of the South Male Atoll without venturing too far from the island.

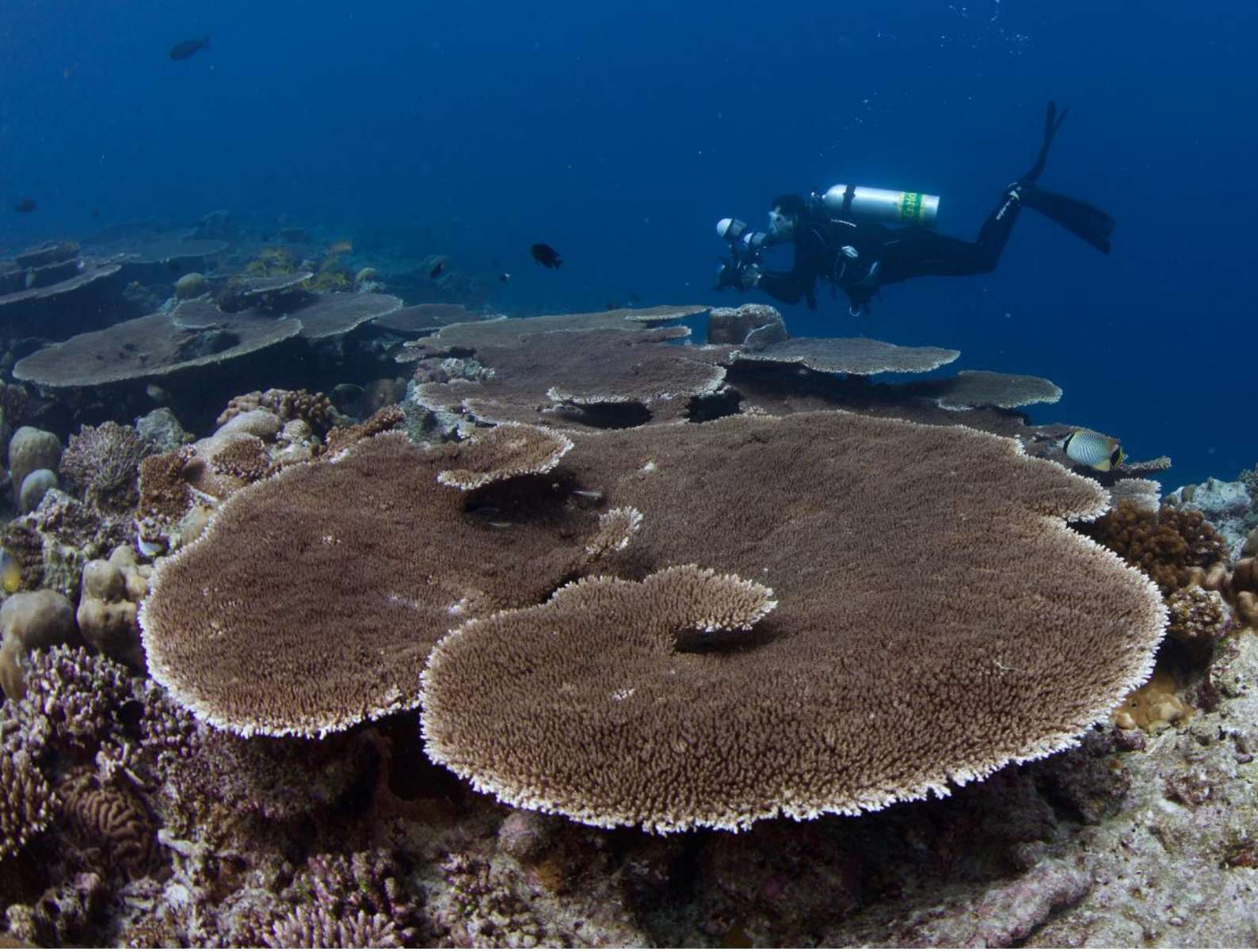
Back at the villa, we assembled our underwater camera gear, just in time for sunset. As we were situated on the sunset side of the island, it was easy to take the few steps required from our villa into the sea and take a few pictures. As the sun went down, we tried to catch some split levels of the shallow reef formations with the cloudy sunset in the background.

The next morning, we clumsily cycled to the dive centre with our camera housings in bags hanging from our shoulders, and our masks and fins popping out of the bike basket. On arrival, e had the pleasant surprise to be the only diving guests on arrival. We boarded a beautiful refurbished and polished version of the traditional wooden Maldivian fishing boat with a dive guide, the captain and two other staff members all to ourselves and headed out for our first day of diving.

As we jumped into the water, we were amazed by the richness of the reef and the abundance and diversity of fish life. We descended into a cloud of majestic bannerfish, onto a beautiful shallow reef and then continued along a sloping wall along the outer reef.

A pleasant surprise was the number of hawksbill sea turtles that we encountered. We saw a minimum of four turtles on every dive and all turtles were extremely friendly and inquisitive, making for excellent photos. One particularly curious male hawksbill proceeded to bump repeatedly into my glass dome port, apparently very interested in his reflection. He even tried several times to bite his imaginary rival, providing a very close view of his beak-like mouth from which the hawksbill turtles get their name.

The sites that we dived were extremely pleasant, slowly drifting along the reef on a light current and enjoying the stunning coral life. We saw whitetip and blacktip reef sharks swimming along the reef as we drifted, and moray eels poking their heads out of rocky outcrops. Reef life is abundant and there is



high biodiversity with many different species of butterfly fish, angel fish, trigger fish and surgeon fish, as well as a variety of different anthias species creating explosive clouds of colour around the gorgonian fans and coral formations.

On the second day, we dived a beautiful site called 'Embodoo Caves'. The wall at this site was steeper than the previous dive, and it featured many ledges and multiple small caves. The soft coral formations along the cave edges were extremely colourful and vibrant, and there were many beautiful anemones offering protection to busy clownfish. Large coral bommies created narrow passages along the wall with thousands of anthias creating a halo of bright orange. The shallower reef consisted of mainly hard coral, with huge acropora tables and massive stag horn coral formations and in amongst them, an astonishing diversity of many smaller hard coral species. Whitetip reef sharks occasionally swam past in the shallower waters, and small hawksbills were seen casually drifting around and nibbling at corals.

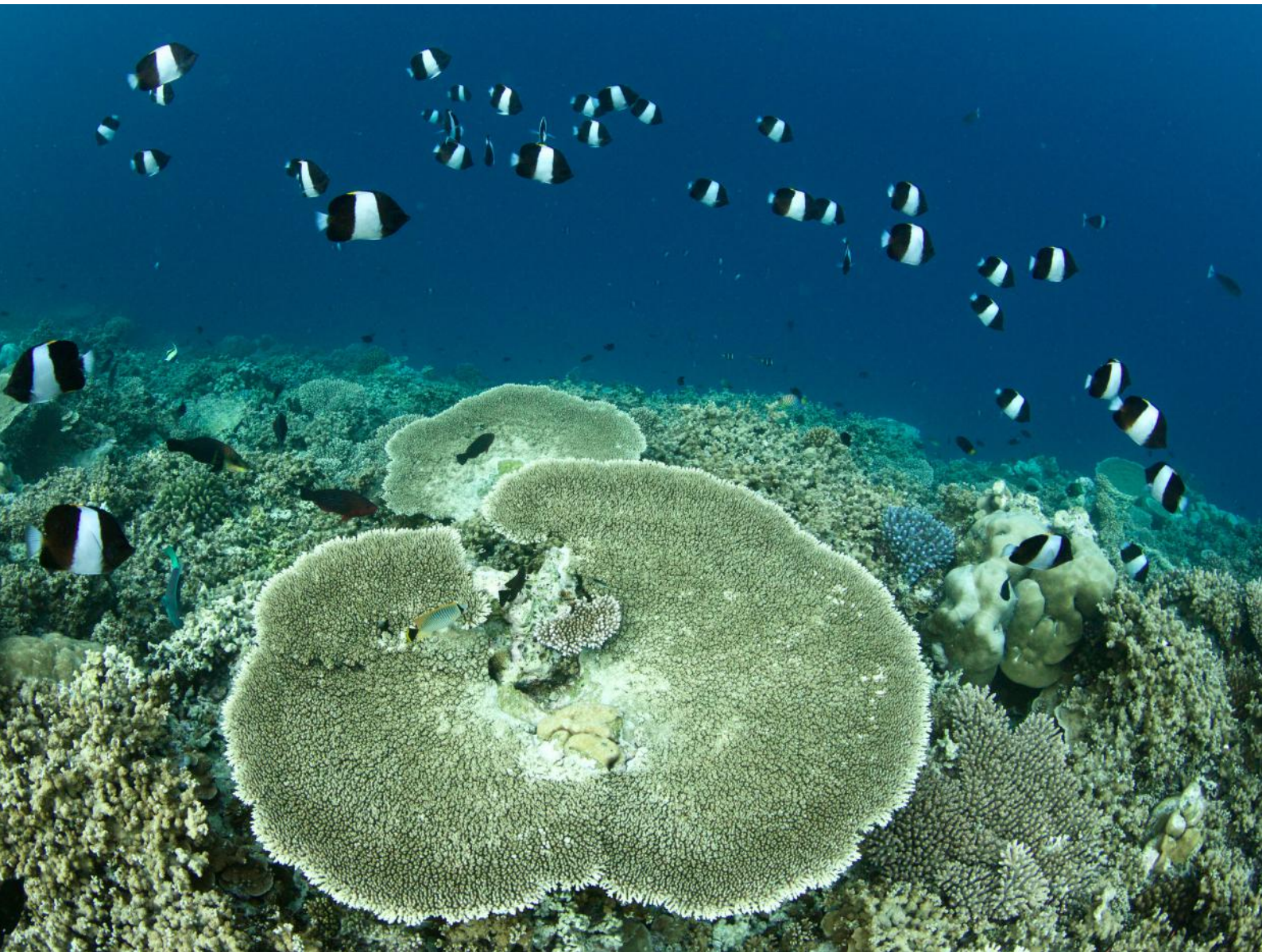
At the end of each dive, hot tea and fruits were served and with the two to one staff to guest ratio, we were pampered all the way. In the late afternoon, we had the opportunity to get the cameras wet again. Every day before sunset there is a stingray feeding session next to the island's main pier. Lots of big stingrays and a few big jacks arrive at the shallow shore to grab an easy snack. Being in the water is forbidden during the feeding session to avoid the risk of injury to the stingrays or people. However, the clever stingrays start to gather close to the shoreline about an hour or so before the feeding begins. When we saw the rays, we asked for permission to sit carefully on the very edge of the shore and dip our cameras into the water to catch some stingray images. Without food in the water, the rays approach quite calmly without stirring up the sand, and we manage to capture a few lovely stingray portraits between the white sand the and blue surface reflection.

The return flight to Dubai takes off at 10pm, so we had a complete final day to relax and snorkel the house reef. Check out for the hotel is normally at noon, but as we had the whole day, the hotel kindly moved us to one of their amazing water villas until our departure. We had enjoyed the beach villa but the water villa was a different experience altogether. The villa had a private infinity pool looking out to sea, a huge and luxurious bathroom, a stunning view of the island, and parts of the villa floor were made of glass; a fantastic experience.

After a couple of hours of morning relaxation at the new villa, we forced ourselves to leave to explore the reef. From the water villa we simply jumped into the water and snorkelled around to the reef. Parts of the house reef were impressive and soon after we set off, a very friendly hawksbill appeared and let me follow her for a while, whilst she grazed the corals and surfaced for a few breaths. The reef is really healthy and interesting along the Male side of the island, and as we moved further along and closer to the pier, the substrate turned sandy with the occasional coral formation. The staff on the island had chosen this area to locate a coral regeneration project and had placed some metal structures with coral frags attached, ready to grow into a new reef. We were told that sometimes guests get involved and help the staff to set up the coral frames, a very nice initiative indeed. After an enjoyable afternoon of snorkelling, we made it back to our luxury water villa just in time to watch the sunset one last time.

Beautiful accommodation, caring staff, fantastic diving, friendly turtles, amazing stingrays, stunning sunsets, perfectly white sandy beaches and turquoise blue waters make the Maldives an enjoyable and relaxing long weekend destination with some great diving to boot!


Dolphin 02



# GREAT DIVE SITES IN MALAYSIA

FEATURE AND PHOTOGRAPHY **HAJI SYED ABD RAHMAN**

Diving in Malaysia is like entering an underwater playground. From micro marine life to wartime shipwrecks, diving in Malaysia is exploration to a whole new level.

There are over 3,000 species of fish in the waters of Malaysia and hundreds of types of corals, with new species of marine life constantly being discovered. With an average temperature ranging from a high of 31°C and a low of 24°C, Malaysia has among the most consistent weather in the region, with the longest favorable dive periods. In general, the best months to dive are between February and September, when the waters are at their calmest, sunny days at their longest, whilst rainfall and humidity are relatively low.

With the monsoon season affecting the east coast islands, Peninsular Malaysia is temporarily closed from November to March. Some of the most beautiful dive islands such as Mabul and Sipadan in Sabah, are protected by the Borneo landmass and remain open all year round. Depending on where you dive, the currents of Malaysian waters are gentle that scuba diving becomes a relaxing and a stress relieving experience.

## 1. SIPADAN

One of the world's renowned oceanographers, the late Jacques Cousteau, described Pulau Sipadan in Sabah as an untouched piece of art, while divers around the world have voted it as the best diving spot in the world. Malaysia's only oceanic island is very small at only 12 hectares in size. A 25 minute walk is all that is required to circle this Sabah Island on foot. Surrounded by crystal clear waters, this crown jewel is a treasure trove of some of the most amazing marine animals.

Pulau Sipadan offers some of the best wall diving in the world. The water's edge presents a drop of more than 600 meters (3,000 feet) just 9 meters (30 feet) from the beach.

All the dive sites are within easy reach by speedboat. Thousands of healthy marine life, big and small, inhabits Pulau Sipadan, making it one of the most exciting dive locations in the world.

Some of the main attractions of diving in Sipadan are the vortex schools of barracudas, schools of bumphead parrotfish, and the thousands of trevally close to the surface. Healthy families of turtles await to be photographed and white and blacktip sharks roam the reefs.

**Getting There:** From Kuala Lumpur International Airport, you must get a domestic flight to Tawau Airport in the state of Sabah, then take a bus from Tawau to the coastal town of Semporna. From there, it's about a 30 minute boat ride to Sipadan Island.

## 2. MABUL ISLAND

Mabul Island is reputed to be one of the best places in the world for underwater macro photography. Located in the clear waters of the Celebes Sea, off the mainland of Semporna's coastal town of Sabah, it is surrounded by gentle sloping reefs, 2-40 meters deep. Diving is the main activity on this island and it can be done all year round. Marine life that can be seen here include healthy turtles, sea horses, exotic starfish, fire gobies, crocodile fish, pipefish, mandarin fish and snake eels. There are over eight popular dive spots, each with its own specialty.

**Getting There:** From Kuala Lumpur International Airport, you must get a domestic flight to Tawau Airport in the state of Sabah, then take a bus from Tawau to the coastal town of Semporna. To reach Mabul Island, it is a 30 minute boat ride from Semporna and 20 minutes from Sipadan Island.

## 3. LAYANG-LAYANG

Layang-Layang or Swallow Reefs, as it is better known, lies about 300 kilometers north of Labuan near the famous Spratly group of islands. It is a world-class diving paradise. Some rate it as the wall diving Mecca of Southeast

Asia. Its coral walls plunge a staggering 2,000 metres down to the floor of the South China Sea. Its warm waters are crystal clear. Large shoals of pelagic life, including mass numbers of hammerhead sharks, barracudas and jacks frequent these waters.

The island is also a sanctuary to thousands of migratory raptors and is a delight to birdwatchers. Layang-Layang has a 1,067 metre airstrip and a comfortable 90-room, 4-star resort. There is a comfortable restaurant, full serviced recreational dive centre and a swimming pool as well as a souvenir shop. A must destination for serious divers.

**Getting There:** From Kuala Lumpur International Airport, you must get a domestic flight to Kota Kinabalu International Airport in the state of Sabah. If flying to Layang-Layang, you may need to spend the first and last night of your stay in Kota Kinabalu due to the flight timings. Layang-Layang Island can only be accessed as part of an exclusive tour run, by Layang-Layang Island Resort. Access to the resort is between February and October.

### 4. PULAU TIOMAN

This is considered one of the most beautiful islands in Malaysia. Tioman is the largest island off the east coast of Peninsular Malaysia and one of the most developed islands part of the Pahang Marine Parks. If you are in Tioman, start with the dive site of Pulau Renggis, which lies off Teluk Tekek. Here, a myriad of reef life in vast gardens of hard corals such as cuttlefish, angelfish, barracudas and turtles await divers. Deep diving enthusiasts will love Pulau Chebeh, the site of several giant manta sightings, while wreck divers will be fascinated with the Soyak Wreck with its many soft and hard coral adornments.

**Getting There:** Tioman is easily accessible by flight from Subang International Airport which is about 40 minutes from KL International Airport. It is also accessible by land and sea as there are also a few daily ferry services with 90 minutes travel time. If you are traveling by ferry, they leave from Tanjung Gemuk jetty in Rompin, Pahang or through Mersing in Johor.

### 5. PULAU REDANG

Located off the coast of Terengganu state on the east coast of Malaysia, with waters that sparkle in different shades of aquamarine, Pulau Redang is a must-see for any traveler keen on exploring the best of Peninsular Malaysia's diving. The reefs of the Redang archipelago are home to over 55 types of corals and 100 species of fish. The Redang archipelago, is comprised by Pulau Redang, Pulau Ling, Pulau Ekor Tebu, Pulau Kerengga Besar, Pulau Kerengga Kecil, Pulau Paku Besar, Pulau Paku Kecil and Pulau Lima.

This group of islands boast white sandy beaches, spectacular coral reefs and crystal clear waters, making it one of the best dive spots in Malaysia. Among the dive sites, Terumbu Kili offers an exciting diving experience with great coral variety such as soft corals, mushroom corals and gorgonian sea fans attracting many reef fish and a fair share of green turtles.

There is also a dive site known as Big Mount, considered by many to be among another best dive site in Malaysia. Gigantic boulders dominate the vista with a carpet of hard and soft corals, sponges, sea anemones and their clownfish inhabitants. From its beautiful plateau, this site lures you downwards to the deep where more dive treasures abound.

**Getting There:** Pulau Redding is accessible by air with Berjaya Air offering daily flights to the island from Subang Airport which is about 40 minutes from KL International Airport. The traditional way to reach Redang is by ferry. The main jetty is at Syahbandar in Kuala Terengganu's town centre with an hours trip to the island, or alternately from Merang, some 30km north of Kuala Terengganu. From Merang, the trip to Pasir Panjang takes about 45 minutes on comfortable, large speedboats during the regular seasons in March to October.

### 6. PULAU TENGGOL

Tenggol lies not far from the town of Kuala Dungun in Terengganu's mainland and is a favourite site to those who have dived there. The island offers the experienced diver over 20 dive sites and the thrill of wall diving. Pulau Tenggol is about 50 hectares in size and is famous for its spectacular rocky cliffs that offer many excellent dive sites. Here, one can find pristine coral formations and a number of submerged rocks with excellent coral growths. The deep waters surrounding the island, offer healthy marine life with occasional sightings of whale sharks with good visibility, especially during the months of April until June.

Marine life that can be seen here includes reef sharks, rays, nudibranchs and a wide variety of hard and soft corals. For those who are into wrecks, the Kuantan Wreck is renowned here and is easily accessible to divers. It attracts a veritable array of fish life, including batfish, leopard sharks, moray eels and even turtles on occasion.

**Getting There:** Pulau Tenggol is 40 minutes by speedboat from Kuala Dungun, a small fishing village about one and a half hours north of Kuantan and about one hour from Kuala Terengganu. It's located midway between Kuantan and Kuala Terengganu.

### 7. PULAU PERHENTIAN

Pulau Perhentian's (Perhentian Island) group of islands are the northernmost islands off the east coast of Peninsular Malaysia. There are two main islands known as Pulau Perhentian Besar and Pulau Perhentian Kecil. Dive sites in Pulau Perhentian are located close to one another. These dive sites are rich with healthy coral and marine life which includes stingrays, nudibranchs, black corals, moray eels and colourful reef fish. Turtles come up to lay eggs between April and September.






For the ultimate relaxing dive, a night time shore dive from the Perhentian Kecil's Long Beach is recommended. You will encounter blue-spotted stingrays, cuttlefish and plenty of reef fish.

**Getting There:** The departure point for all ferry rides to the islands is from the coastal town of Kuala Besut, a fishing village about two hours drive from Kuala Terengganu or 30 minutes from Kota Bharu in Kelantan. There are a few ferry services to choose from. You may want to take the fast speedboat (30 minutes) or the slow ferry (45 minutes - 1 hour), and let the boatman know which island you intend to stop at. Generally, the fast boat makes a few trips to/from Kuala Besut per day while the slow boat, makes only two.

### 8. KUCHING, SARAWAK

Kuching, the state capital of Sarawak is growing in popularity as a destination for scuba diving enthusiasts. The Satang and Talang Talang Marine Park Islands is one of the most popular diving spots. You may explore numerous heathy hard and soft corals covering the reefs such as anemones, sponges, crinoids, coral fish as well as other creatures including lobsters that thrive here. Just off The Santubong Coast in Kuching is the The World War Two Japanese Historical Wreck of Katori Maru and Hiyoshi Maru which lies about 20 metres underwater just waiting to be explored. One of them has a huge coral formation with hard and soft corals in colourful arrays of colour.

**Getting there:** From Kuala Lumpur International Airport, you must get a domestic flight to Kuching International Airport in the state of Sarawak, followed by an hour bus ride to the coastal town of Santubong. The dive sites are no more than 30-40 minutes away from the mainland and the hotel accommodation is both comfortable and affordable.

### 9. MIRI, SARAWAK

Miri is known as an oil city in Sarawak, despite its laid-back appearance, Miri, Sarawak is growing in popularity as a destination for underwater enthusiasts. The Miri Reef is one of the most recently discovered diving spots. One may explore numerous hard and soft corals covering the reefs such as anemones, sponges, crinoids, coral fish as well as other creatures that thrive here. Beneath the waters, the downward slope of the shore tapers out into calm bottoms that host the richest reef life in Malaysia. One of them is Lennon's Memorial, which is a huge coral bommie festooned with hard and soft corals in hues of oranges and reds. There are also two shipwrecks lying 18 metres underwater just waiting to be explored.

**Getting there:** From Kuala Lumpur International Airport, you must get a domestic flight to Miri Airport in the state of Sarawak. There are dive operators in Miri and all the dive sites are no more than 20 minutes away from the mainland. The hotel accommodation is both comfortable and affordable.

### 10. LABUAN, SABAH

The main attraction of Labuan is its four shipwrecks all spread out to the southwest of the island. One of the famous wrecks is the Australian Wreck. It is actually a Dutch steamship that sank during World War II. Here, the broken hull is exposed and hosts an assortment of fish and marine life.

**Getting there:** From Kuala Lumpur International Airport, you must get a domestic flight to Labuan Airport in the state of Sabah. All dive sites including the wrecks are about 40 minutes away from the mainland. The hotel accommodation is both comfortable and affordable.

### 11. PULAU AUR

Just off The Coast of Johor, Pulau Aur is located 65km east of the coastal town of Mersing. This island and its surrounding islands – Pulau Dayang, Pulau Lang and Pulau Pinang






– are rated by divers as the best scuba diving destinations within the Johor Marine Park area.

The waters here are deeper than around the inner islands. Due to its remoteness from the mainland, visibility is excellent with healthy coral and marine life with regular sightings of pelagic fish. One may explore numerous hard and soft corals covering the reefs such as anemones, sponges, crinoids, coral fish, as well as other marine creatures here. Beneath the waters, the downward slope of the shore goes out into calm bottoms that host the richest marine reef life in Malaysia.

**Getting There:** Mersing is about a 4 hour drive from Kuala Lumpur and a 2 hour drive from Singapore. Most local dive shops organize regular weekend diving trips to Aur during the diving season. Boats leave from either Mersing Jetty or Tanjung Leman Jetty which is about 30 minutes from Mersing Town. Due to the distance from the mainland, the boat trip to Pulau Aur takes about two hours by fast speedboat.

## 12. PULAU PAYAR MARINE PARK

Pulau Payar Marine Park is an island just off the well-known Duty Free shopping heaven islands of Langkawi in the state of Kedah, the island comprises of four uninhabited islands of Payar, Lembu, Kaca and Segantang which make up Malaysia's oldest marine park sanctuary.

These islands, famous for the varied and colourful and healthy marine life that they support, offer the best well known diving sites on Peninsular Malaysia's west coast. At Pulau Payar, the largest of the four islands, you will find the Marine Park Centre, which was set up and operated by the Fisheries Department. Here, you will find useful information on the do's and don'ts while visiting this marine park.

The waters of Pulau Payar have an additional attraction of artificial reefs built from tyres, concrete blocks and old boats, which over the years have developed into mature reef formations that are teeming with marine life.

**Getting There:** From Kuala Lumpur International Airport, you must get a domestic flight which takes approximately an hour to Langkawi International Airport. Pulau Payar is located approximately 15 nautical miles west of Kuala Kedah and about 19 nautical miles south of Langkawi Island and 32 nautical miles north of Pulau Pinang. Most people depart from Kuah Jetty in Langkawi on a 45 minute trip with a speedboat or catamaran to Pulau Payar.


### ABOUT THE AUTHOR

Haji Syed Abd Rahman is the Founder and Director of Kids Scuba in Malaysia. He is a PADI Master Scuba Diver Trainer and is currently the Chairman for the ISO Recreational Scuba Diving Standards Committee for Malaysia. He was also the former Vice President of the Malaysia Scuba Diving Association MSDA.

Syed loves teaching and motivating kids and teenagers. His passion in the sport inspired him to start Kids Scuba in 2004.

With the importance to instill conservation awareness to the kids and teenagers, Haji Syed is committed to sharing his knowledge with them to help make the dreams come true of those who want to become scuba divers. From his continued dedication to sharing the sport with children, teenagers, orphaned and disabled youths, it has earned him the International Awards & Recognition for Kids Scuba since 2005.

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# PULMONARY OEDEMA IN FREEDIVERS, A POSSIBLE SOLUTION

FEATURE **DR. DIEGO OLIVARI – DIVING AND HYPERBARIC DOCTOR** PHOTOGRAPHY **ALICE CATTANEO**


My studies of the pulmonary oedema in breath-hold diving started two years ago during my employment as a diving doctor in the Italian Freediving National Team. I worked with a lung ultrasound to follow up the pulmonary oedema in patients with heart failures while working as an emergency doctor, and I started to apply this technique to monitor freedivers (apnoea divers) with problems caused by a squeeze or blood in the sputum after a breath-hold dive. Following my evaluations, I noticed a high frequency of ultrasound detectable signs of oedema in freediving athletes with no signs of symptoms. A great team of specialists from the Milan City Hospital Niguarda started working on this project to understand how an oedema starts and how it can be avoided. I would like to thank all the specialists that have planned and performed the research protocols, the data collections and the statistic analysis: Dr. Sergio Arlati and Dr. Enrico Storti – Critical Care Department of 1st Anesthetic and Reanimation Services; Dr. Rossella Giacomello and Dr. Sara Sher Soreu – AAT (Emergency Department), 118 Milan; Dr. Sonja Felicita Lamberti – 1st Internal Medicine; Dr. Fabio S. Garuti – Hyperbaric Medicine Centre; and Dr. Silvia Guenzani –Technical Medicine Consultant of the Italian National Freediving Team.

## A BRIEF REVIEW OF THE RESEARCH

Extra-pulmonary water in lungs often increases after a deep breath-hold dive. The amount of water accumulated usually ranges from minimal (clinically silent) to moderate (e.g. scarce pink foamy sputum) although a symptomatic pulmonary oedema can occur. Previous studies have estimated the prevalence of pulmonary oedema among breath-holding divers from 5% to 50% (or more) depending on the accuracy of diagnostic methods (usually based on a physical examination).

Lung ultrasound (US) examination is a standard method for detection of even minimal amounts of extravascular water in lungs in both clinical and experimental medicine. Moreover, the US is the only reliable, non invasive and repeatable method that allows for an accurate assessment of pulmonary water in an outdoor setting such as a freediving session at the seaside. The increased extravascular water is easily detected by the appearance of "B lines" (lung comets) – artefacts arising from reflections of ultrasound waves on the thickened alveolar septa. In previous studies, the appearance of lung comets has been detected in over 70% of elite apnoea divers.

After recognizing this frequency of occurrences in apnoea divers, we started to look for a method that could help the recovery of the lungs. Starting a new diving session with a pulmonary oedema, also without symptoms, could reduce the elasticity of the pulmonary tissues and increase the risk of rupture of the alveoli after a lung squeeze.

Continuous Positive Airway Pressure (CPAP) is universally used for the treatment of a pulmonary oedema in both clinical and out-of-hospital settings. The application of CPAP allows for more rapid re-expansion of collapsed alveolar units and the reduction of liquid in the lungs. Moreover, it allows for faster relief of respiratory symptoms as dyspnoea, shortness of breath, cough and chest tightness.

However, both the feasibility and effects of CPAP in relieving post-dive lung water accumulation has not yet been tested, as the general perception is, that CPAP implementation in an outdoor setting, carries severe logistical difficulties.

After a deep breath hold dive, elite apnoea divers are made to descend back down to shallower depths for a few minutes to breathe a mixture of air and oxygen. This practice is believed to encourage faster relief of fatigue and shortness of breath, although it is unclear if this practice has an effect on reduction of post-dive water accumulation in the athletes' lungs. In an immersed diver, a positive or negative pressure may be exerted across the respiratory system due to the difference between the pressure of the gas delivered by an open circuit breathing unit and the external hydrostatic pressure at the centroid of the

lung (Lundgren). In the head-up position, the difference between mouth pressure and lung pressure is negative, but in the head-down position, the pressure has positive analogous to the clinical application of CPAP.

After this evaluation, we decided to verify the efficacy of CPAP in reducing the amount of post-dive water accumulation in the lungs. The goal was to test if a head-up immersion had any positive effects on the reduction of water in the lungs and to verify the efficacy of CPAP produced by a head-down immersion in water.

Elite and amateur apnoea divers were studied in five distinct sessions. Elite divers were members of the National Italian Team in constant weight apnoea. They were examined during three day workout sessions at Y40, a 42 metre deep indoor pool near Padua (Italy) and six day sessions in Sharm-el-Sheik (Egypt) respectively in April and May 2015.

Amateur divers were studied in the summer of 2015 during three distinct diving sessions at the Verbano Lake, Orta Lake and Garda Lake (Lombardy, Italy). During each session, 15 minutes of CPAP using the Boussignac system was compared to a no-CPAP (Y-40-Padua and Verbano Lake), head-up immersion while using an open circuit breathing apparatus for 15 minutes at 5 metres depth (Sharm el Sheik) and then a head-down immersion while using an open circuit breathing apparatus for 15 minutes at 0.5-1 metre depth (Orta Lake and Garda Lake).

Each subject was examined with a lung ultrasound before (T0) and immediately after the dive (T1). If the T1 lung ultrasound was positive, a further examination was performed 20 minutes later (T2). Each set of measurements included at least two or three measurements.

## HEAD-UP AND HEAD-DOWN POSITION

Head-up immersion was performed according to divers' habits. The subjects remained submerged at about 5 metres depth, breathing from a SCUBA diving apparatus fixed to a vertical line permanently attached underwater (up-line). In the head-down position, the subjects breathed from a SCUBA diving apparatus at a depth of 1 metre. The divers' head was held under by a step from the pool's ladder or the lake entry stairway, while the feet floated freely on the water's surface – this way, the divers' mouth remained 10-15cm below the level of the lungs. The SCUBA diving apparatus was fixed underwater at the ladder with a second stage set to free flow to facilitate breathing.

## CPAP TREATMENT

Continuous positive airway pressure was administered by the Boussignac-CPAP valve. This is a compact portable system capable of delivering pressure by constant oxygen insufflation. It includes a plastic tube with four funnel-shaped micro channels in the tube wall. When oxygen or air is injected into the micro channels, the gas molecules accelerate and turbulence occurs, creating a virtual valve. The speed of the gas flow determines the CPAP level which makes the pressure flow-dependently. A face mask was placed over the divers' face and connected to a disposable CPAP device, allowing the delivery of +10cm H20 of constant-flowing pressure of oxygen insufflating from a portable source.

8 elite divers and 71 amateur divers participated in the study. 61 measurement sets were obtained by elite apnoea divers during the sessions in Y40 and Sharm el Sheik. About 7-8 dives were performed by each athlete with 12 hours between two consecutive dives. 71 sets of measurements were obtained by amateur divers during three lake sessions. A total of 132 sets of measurements were achieved. The median depth of the dives was 70 metres (42-87 metres) for elite athletes and 25 metres (18-31 metres) for amateur divers. No symptoms were reported among elite divers while a small amount of red sputum occurred in two amateur divers. Although we did not find a further increase in the lung score, the CPAP was immediately started in these two cases, with resolution of haemoptysis and an almost complete disappearance of B-lines. In the second symptomatic diver, an abundant haemoptysis occurred after a dive to 50 metres in cold water (less than 10°C). Although his score at T1 was 5pts only, we started CPAP anyway. After 15 minutes, all the B-lines disappeared and breathlessness was substantially reduced, but the haemoptysis persisted for a few hours. Lung ultrasound was positive at T1 27.4%, 29.5% from elite divers and 25.3% from amateur divers.

The statistical analysis of data revealed that CPAP was superior to any other treatment in obtaining the reduction of the score from T1 to T2. The head-down immersion was superior to head-up immersion, although not significantly.

Our study demonstrates that CPAP is feasible in the field (outdoors) after a deep breath hold dive by using a portable oxygen source. It is easy to guess that SCUBA tanks might be used as portable gas sources to make the use of CPAP more accessible. This seems important with increased popularity of breath hold diving worldwide and the number of reported accidents. Our results suggest that a CPAP system should be available during every apnoea freediving competition and in all diving clubs to ensure valuable first-aid to amateur freedivers.

CPAP proved to be a superior method for clearing the water accumulated in the lungs compared to any alternative procedure. Our data indicates that 75% of water disappeared within only 15 minutes. Although minimal increases of water occurred, the efficiency of CPAP proves its reliability and feasibility, suggesting its use in even more extreme settings, for example, a rescue boat.

Without a systematic analysis, I noticed in other cases that the B-lines (with or without symptoms) are more common after a dive during which the freediver had performed a compression and a contraction of the abdomen and chest muscles (sometime it seems enough to pull himself on the rope to start the ascent). It could suggest that the pulmonary oedema starts because of the blood shift. and it increases after a compression of the chest due to not being relaxed or a wrong movement.

New studies have been planned with the use of ultrasound while underwater to understand how and when the oedema appears. This research will start in a new diving medicine research centre in Dubai.

# DIVING BEYOND RECREATIONAL LIMITS

FEATURE **PETER BUZACOTT & MIROSLAW ROZLOZNIK** PHOTOGRAPHY **CRISTIAN PELLEGRINI**


Beyond recreational depths, the "technical" diving community pushes the frontier of "recreational" diving steadily to deeper and less-forgiving environments.

Rebreathers, once almost exclusively used by the military, are now commonplace the world over. Blends of helium and EANx are more commonly available than ever, along with the training to use such mixtures. Using long-range scooters, technical divers are reaching further and further into caves, often with decompression schedules that are experimental in nature. Let us now look at some of the consequences of these developments.

Firstly, the clinical manifestations of DCS are often different after breathing multiple gas blends on the way back up from 100m depth. Inner-ear DCS has become widely reported in just the last 25 years and, research has shown, is often associated with the "hole-in-the-heart", known as a Patent Foramen Ovale (PFO).

Consensus of medical opinion is that the risk of DCS in recreational divers with PFO is between 2.5-6.5 times higher than in divers without a PFO, so the risk is still so small that routine screening for a PFO is not justified. In technical diving however, divers go beyond recreational limits and often require decompression before surfacing. At least one technical diver training agency recommends screening for PFO before engaging in decompression dives.

Rebreathers are typically quite unforgiving if the diver makes an error. These hightech devices require more detailed and exhaustive training, as well as proper maintenance including a far lengthier pre-dive check. For example, if a recreational diver forgets to turn his SCUBA tank valve on, then he will realise this when he first attempts to breathe and cannot suck any air. He will then normally be able to surface and have his valve turned on: an incident, not an accident. With many rebreathers however, if the diver forgets to turn on the oxygen cylinder, no immediate consequence follows. The oxygen already in the breathing loop however slowly and unnoticeably gets consumed – until the diver suddenly "blacks out" into unconsciousness and death, even with the mouthpiece in place. This is known to have happened in very shallow water.

While the exact increase in risk over ordinary SCUBA diving is not yet known, the consensus of opinion is that rebreathers have a much higher mortality risk. A recent analysis estimates the increase in fatality risk between 4 and 10 times. Considering that the risk of fatality while diving open circuit is thought to be between 0.6 and 2.1 per 100,000 dives, then the absolute risk of death on a rebreather may not be as high as some might expect. Even so, until recently, rebreather diving was specifically excluded from some recreational dive insurance's coverage. As the situation becomes clearer, rebreather divers are now able to purchase insurance that is equal to that offered to recreational divers.

Another relatively recent development in recreational SCUBA diving is the availability to begin diving at a younger age. At least one major training agency now offers children SCUBA diving lessons from age 10, albeit with depth and supervision restrictions. Meanwhile, research into the effects of diving among children continues. Similarly, though at the other end of the scale, only now that SCUBA has been so widely available for 40 years are we starting to consider the long-term effects of diving. We know that bubbles often form in our bodies even after dives considered "safe", and that these decompression bubbles cause measurable effects on the cells and function of the endothelium, the inner lining of our blood vessels. Will a lifetime of deep decompression diving cause memory deterioration or other undesirable late effects? A recent article suggested that there might be very minor

changes in cognitive functions of recreational divers, however, with no negative effect on their "quality of life". Nevertheless, there is some limited evidence available in professional divers.

Meanwhile, diving is here to stay and it is easier than ever to learn to dive and, thereafter, to rapidly progress to ever-deeper depths. Dive equipment has never been so affordable either, or so user friendly. Indeed, most modern dive computers will display decompression information, or at least emergency decompression information, for repeated dives well beyond recreational limits. Before dive computers were common, older divers and medical specialists would have assumed, for example, that anyone diving to 50m would know that they best not dive there again in the afternoon, that it is safer to allow at least a full day for their body to desaturate. However, it is not uncommon these days for divers to present to hyperbaric chambers with DCS after exactly such "unsafe" deep, repetitive dives.

While the technology has progressed, there is a growing concern that basic diving knowledge is dropping to lower and lower levels. In many cases, modern dive course students do not even learn about the dive tables anymore, and fail to appreciate the relationship between depth and no-stop time or to learn the rules for exceptional exposures. It is little wonder then, that some divers may be learning these rules for the first time at their local hyperbaric chamber. Even in technical dive courses it has become rarer to learn dive planning with tables and, thus, the newly-minted technical diver might one day find himself unsure what to do when his rechargeable dive computers go flat during a long dive.

## WHERE TO NEXT? – THE FUTURE

We predict the face-to-face component of diver training will continue to diminish. Over this century the Internet has become so commonplace that diving course students now regularly complete the cognitive development portion of the course online. It is only a matter of time before fully online dive courses become available.

Already at least one rebreather manufacturer is offering online certification for their particular model of rebreather, with no face-to-face component.

It is also plausible that redundancy of specialised diving equipment will be more and more considered, leading to the development of very modular and redundant diving equipment. Such new concepts will probably ease the reconfiguration of equipment underwater in case of non-standard and or emergency situations, allowing technical divers to rely on their equipment even more than now.

Of particular concern to the "old school" technical diver is that the use of dive computers is being adopted as fail-safe for decompression planning. The marriage of PC-based decompression planning software and diver-worn wrist computers has been welcomed by recreational as well as technical divers but this should not mean the fundamentals of dive planning are allowed to be handed over to a computer. A solid grounding in the theory that underpins the relationship between diver´s physiology, physical fitness, depth, time, decompression obligations and gas consumption gives a technical diver the ability to spot weaknesses and flaws in computer-based modelling.

While dive computers continue to improve in reliability as well as the approximation of human tolerance for decompression stress, tablebased dive planning should continue as a staple of technical diver training. This is akin to learning the Slide Rule during the earliest availability of the electronic calculator when, until computing power matched the demands of scientists, engineers, etc., it was prudent not to abandon the old ways. We are in a developmental transition phase now and not yet quite ready to totally rely on dive computers. One training agency has even taken a stand against using them, because their success at safe decompression remains to be scientifically evaluated.

Concomitant with this development is the worry that technical divers are swapping to dive computers and automated gas consumption calculations without a commensurate increase in their ability to respond to emergencies when these automated procedures fail the diver. This happens regularly, for example, when divers make repetitive dives to serious depths because "the computer didn't give any warnings" or when they do not have enough gas for deco and surface earlier than planned because "the computer said I would have enough". As we transit towards a reliance on technology, let us keep sharp those skills that got us this far.

More than one diver has had a total computer failure during deco and pulled out his trusty wet-notes for a contingency plan. Wearing more than one computer should not mean technical divers do not need to cut out-of-gas and contingencydepth plans. The decompression of non-standard dives, (e.g. reverse profiles, yoyo or repetitive diving), commonly seen in cave diving and to some extent also in deep diving, is not yet fully understood and possibly requires re-consideration in the face of new in-field research.

Lastly, as our training and procedures evolve we urge all technical instructors to stay abreast of the latest research and technical developments. This can be done by attending conferences such as EuroTek, Techmeeting and/or OZTeK, reading technical diving magazines and participating in technical dive forums.

So, our last word is: Soak up technical diving knowledge but be aware that not all of it is accurate. Half of what you've been taught is probably untrue – unfortunately, it is not yet known which half.

So prudence and conservatism is the only sensible option. It is too much of a pity to have to treat a bent diver who was not aware of the risk he/she was taking when embarking on that dive!

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The article is an excerpt from the book "The Science of Diving, Things your instructor never told you".

Published by Lambert Academic Publishing, it can be purchased online here, or can be ordered via any bookstore using ISBN number 978-3-659-66233-1. The book is sold at €49.90 and all royalties from the sales are donated to EUBS, to promote further diving medicine research.

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# PREVENTING BREATHING-GAS CONTAMINATION

FEATURE ORIGINAL TEXT BY **BRITTANY TROUT**, ADAPTATION BY **FRANCOIS BURMAN** FOR THE EU STANDARDS

Incidents involving bad breathing gas — be it air, nitrox, trimix or another mixture — are rare, yet they do occur. Health effects on divers vary depending on the contaminant breathed. Among the most severe symptoms of breathing contaminated gas are impaired judgment and loss of consciousness, both of which may be deadly underwater.

Sources of contamination include hydrocarbons from compressor lubricants, carbon monoxide (CO) from engine exhaust (or overheated compressor oil) and impurities from the surrounding environment such as methane and carbon dioxide ($CO_2$). Dust particles in breathing gas can also be hazardous, potentially impairing respiratory function or damaging diving equipment. Excessive moisture can cause corrosion in scuba cylinders and other dive gear and may cause regulators to freeze due to adiabatic cooling (heat loss subsequent to increased gas volume).

| CONTAMINANT | SIGNS AND SYMPTOMS |
|---|---|
| Carbon Monoxide (CO) | Headache, dizziness, weakness, nausea, vomiting, shortness of breath, impaired judgment, confusion, unconsciousness, potential death. |
| Carbon Dioxide ($CO_2$) | Hyperventilation, dizziness, confusion, unconsciousness. |
| Volatile Hydrocarbons | Fatigue, headache, confusion, impaired judgment, numbness, cardiac arrhythmias, unconsciousness. |
| Oil (condensed) | Headache, nausea, impaired respiratory function. |
| Dust (particles) | Impaired respiratory function. |
| Methane | Asphyxia due to dilution hypoxia. |

## RECOMMENDATIONS FOR COMPRESSOR OPERATORS

Compressor operators can help prevent gas contamination and mitigate the risk of dive accidents in several ways.

**Attentive compressor maintenance:** Proper compressor maintenance helps ensure breathing-gas quality as well as extends the life of the compressor. Breathing-gas contamination is less likely in well-maintained and properly functioning compressors. If maintenance is neglected and the compressor overheats, the lubricating oil may break down and produce CO and other noxious byproducts.

**Effective procedures:** A fill checklist can help ensure safety procedures are remembered when cylinders are filled. Before starting to fill tanks, the operator should inspect the compressor's filters for damage and note the presence of contaminants such as cigarette smoke, paint fumes or engine exhaust near the intake. If the operator notes any chemical or oily odours after filling has started, he should shut down the compressor immediately. Other useful strategies for reducing the risk of gas contamination include keeping records of air fills and maintenance, ensuring operator qualifications are up to date, using proper oil and filters, and maintaining a clean and organized tank-filling room.

**Air-quality testing:** As a diver descends and ambient pressure increases, the amount of gaseous contaminants breathed also increases. This explains why a contaminated gas that is not toxic at the surface may be at depth. Breathing gas must be tested for a variety of contaminants both regularly and continuously to ensure compliance with diving-adjusted contaminant levels.

Compliance with breathing-gas quality standards is not strictly enforced, and most of the responsibility for testing lies with the operator. Several methods of testing are available to compressor operators, and they vary in price and complexity. Continuous CO-monitoring devices include electrochemical sensors with colour indicators. Devices that continuously monitor moisture levels are also available. Operators can perform analyses on site, using typical indicator tubes or they can send a breathing-gas sample to an accredited laboratory for analysis of oxygen, CO, $CO_2$, moisture, oil/hydrocarbons and even particulate matter; this is recommended on a quarterly basis.

## RECOMMENDATIONS FOR DIVERS

Ask questions and be observant. If you are unsure about the breathing-gas quality at a filling station, ask questions about compressor maintenance, procedures and testing. Ask if the compressor operator monitors for CO and how often they send samples to a lab for analysis. Look for posted breathing-gas-analysis reports, and note whether the fill room is clean, organized and well ventilated. Observe the proximity of the compressor intake to sources of exhaust, and look to see whether the compressor has an hour meter that can be monitored for regular maintenance.

Always conduct a predive gas check. If your breathing gas has an unusual odour or taste, do not dive with it – this is a red flag for oil or combustion contamination. However, keep in mind that not all contaminants can be detected this way; CO, for example, is odourless and tasteless. Electronic CO detectors or products such as CO-PRO can be used to detect the presence of CO in breathing gas. Divers should always use oxygen analyzers to determine the level of oxygen in a nitrox mixture to prevent oxygen toxicity.

## CONFIRMING CONTAMINATION

Identifying contamination incidents based on symptoms alone is difficult, as the associated symptoms are often similar to other diving-related and nondiving illnesses. If a diver suspects he was exposed to bad breathing gas, he should seek a medical evaluation and have the gas tested. Observing the health of other divers who had their tanks filled at the same source may be helpful in determining whether a diver's symptoms are related to contamination.

**The Co-Pro™:** A quick and effective way to detect CO in breathing air. If the air is contaminated by CO, the Sensor within the balloon will change colour. You can discover this and many other safety materials in the DAN Shop.

DAN Europe Launched the Air Quality Safety Campaign in 2014.

If it wasn't for scuba cylinders that give us the possibility to breathe underwater, we wouldn't be able to enjoy the wonderful marine life. However, that is no reason to blindly trust your breathing gas. There are various kinds of contaminations that can turn your underwater life support into pure poison. The slogan "Safety is in the air" wants to make divers attentive to the risk of contamination in the breathing gas.

**Discover more about this and other DAN Europe safety campaigns:**
www.daneurope.org

**Join the campaign on our Facebook page:**
DAN-Europe-Divers-Alert-Network-Europe

**Follow the campaign on Twitter:**
#breathinggasquality #divingsafety

### AIR QUALITY SPECIFICATIONS FOR RECREATIONAL DIVING

| CONTAMINANT | MAXIMUM LEVELS |
|---|---|
| Oxygen | 20-22% |
| Carbon Dioxide | 500 $ppm_v$ |
| Carbon Monoxide | 10 $ppm_v$ |
| Total Hydrocarbons, including Methane | 25 $ppm_v$ |
| Oil/Particles | 0.5 $mg/m^3$ |
| Water Vapour<br>• up to 20 Mpa<br>• up to 30 MPa | <br>62 $ppm_v$<br>31 $ppm_v$ |
| Objectionable Odours | No odour |

Source: EN 12021*: Compressed Gas Association (CGA) Grade E, National Fire Protection Association (NFPA) 1500, American National Standards Institute (ANSI/CGA G-7.1'97)
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# WEIGHT UP!

DAN® DIVERS ALERT NETWORK EUROPE

FEATURE **MARTY MCCAFFERTY, EMT-P, DMT,** AND **PATTY SEERY, MHS, DMT**

Early in dive training, students learn that there are three elements involved in buoyancy control: the buoyancy compensator (BC), weights and lung volume. Although most divers are familiar with the need to be properly weighted, many do not understand all that it entails. Students and experienced divers alike make two common errors when it comes to weighting: diving while overweighted and failing to adjust the amount of weight used in response to changes in equipment and environment.

## DON'T WORK TOO HARD

Improper weighting makes it harder to achieve neutral buoyancy. Many divers who wear too much weight do not even realize they are overweighted. The excess weight means that to achieve neutral buoyancy the diver has to put more air into the BC bladders, which can create a more upright profile in the water. The upright position increases drag when swimming, causing the diver to expend more effort and consume more air. Underweighted divers can also become significantly fatigued while trying to stay down. In addition to increasing breathing-gas consumption, extra exertion can elevate decompression stress.

## GET IT RIGHT

You may have heard a diver say, "This is how much weight I always use." While field testing and prior experience can be useful, this statement shouldn't be the endpoint of a dialogue about weighting. Proper weighting requires thought and practice, and the amount of weight worn is not fixed. Over the course of our lives, we experience change in muscle mass, body fat and physical fitness. Equipment, including wetsuits, wears out and gets replaced. Dive environments differ. All these factors affect buoyancy and require adjustments to the amount of weight used.

To determine how much weight you need, consider your body weight, the exposure protection you will be wearing, the weight of your equipment and the environment in which you will be diving. Start with weight equivalent

to 10 percent of your body weight, which is a good baseline for a 6mm full wetsuit. For a 3mm suit, use 5 percent of your body weight. Remember that these percentages are simply starting points.

Drysuits and thick neoprene necessitate more weight to counter the suits' buoyancy than do thin neoprene or dive skins. Body composition (muscle density, for example) will influence whether more or less weight is needed. Diving with an aluminum tank requires more weight than diving with a steel tank.

Saltwater is denser than freshwater, thus increasing the buoyancy of immersed objects and requiring more weight to descend. Dive training typically begins in freshwater environments such as pools, quarries or lakes, so new divers should consider that even if they are wearing the same exposure protection they will need to add weight for ocean diving. The exact amount of additional weight needed will vary from person to person. Performing a buoyancy check in each situation will help determine the correct amount of weight to add.

## SECURE IT

There are several options available for how and where to secure your weights. A weight belt is the most common method of wearing weights; there are belts that accept slide-on weights as well as pocket belts that can accommodate either solid weights or soft weights (bags filled with lead shot). Weight belts are easy to ditch in an emergency as long as you keep other gear clear of the belt. A shoulder harness is sometimes used when the buoyancy of thermal protective suit requires more weight than can comfortably be worn around the waist.

Integrated weight pockets and harness systems offer a couple of advantages over belts: They can be considerably more comfortable, and they offer improved ability to adjust trim. But unlike belts, which have a single point of release, harnesses and integrated systems may have more than one release point. This is crucial information for the diver and dive buddy to discuss prior to diving – and to remember in the event of an emergency. A downside to using weight pockets is that it may be more difficult to add or remove weights if adjustments need to be made.

## STAY TRIM

In addition to wearing the right amount of weight, make sure it's positioned to optimize underwater trim. Creating a level profile in the water makes you more hydrodynamic. Distribute the weights as equally as possible from side to side; you should never feel as though you are listing to one side while diving. You should also consider the weight of your scuba tank and the style of your BC when placing your weights. The tank can be moved up or down in the tank band to facilitate optimal body positioning in the water. Back-inflation BCs have a tendency to push the diver forward (face down) in the water, so placing weights toward the back can help to counter some of this forward pitch, especially at the surface. While weight pockets on the back of your BC can help with trim, they also present a hazard in an emergency because buddy assistance is required to remove them if ditching weight becomes necessary.

Fins can be positively, neutrally or negatively buoyant, and each type may require compensation. Ankle weights can help offset a more buoyant lower body half, but they may be a challenge to ditch, because you have to reach to release them. If your fins are negative and create a downward pull on the lower half of your body, moving weights higher on your body or shifting your tank higher in the band can move up your center of gravity to promote a more level profile.

Reviewing where and how your buddy's dive weights are placed is an essential component of every predive check. Each buddy needs to know how to jettison the other buddy's weights in an emergency.

Learning to determine proper weighting will enhance your enjoyment of dives as well as your safety. Having a good understanding of your baseline weighting needs and the factors influencing your buoyancy will aid you in adjusting to a variety of environments and conditions.

## HOW TO PERFORM A BUOYANCY CHECK

Start in water too deep to stand in, and release all the air from your BC. Inhale a normal breath, and the water should be at your eye level. When you exhale, you should sink so that the water is just over your head and then rises to your eye level as you inhale normally again.

Adjust your weights in small increments (e.g., 1kg at a time). Consider adding a little extra weight to offset the potentially positive buoyancy of a partially emptied aluminum cylinder at the end of the dive.

If you are properly weighted, you should be able to hover effortlessly at 4.5m at the end of your dive with 500psi in your aluminum tank and no air in your BC.

# FLYING AFTER DIVING:
## FINALLY THE FACTS (NOT JUST THEORY)

FEATURE **STEFANO RUIA**


The study of data collected in the first research campaign of DAN Europe's Diving Safety Laboratory (DSL) "Flying bubbles" project has concluded. The results are somewhat surprising, to such extent as to merit publication in Aviation Space and Environmental Medicine, a revered scientific magazine.

### DIFFERENT THEORIES

We have seen what comes before, what goes on during, and now… there will be a "what happens after." In the realm of post-dive flights, DAN's "Flying bubbles" project marks the divide between theory and fact.

Before this project there were varied recommendations of how long to wait after a dive before taking a plane in order to avoid the risk of decompression problems, caused by cabin depressurization. However, all this was based only on theory: in DAN's case, the duration of the wait period was established by monitoring actual decompression illness situations, while in other cases, it was based on the assumption that "until now there haven't been many problems, so let's just keep doing what we're doing."

Those who have used the old U.S. Navy tables probably have vague memories of having to be categorized as group "D" before flying. In certain cases it was even possible to fly immediately! Subsequently, fixed intervals were added (24 or 48 hours), depending on whether the last dive was a single or a repetitive one, and whether within the curve or outside the curve. Even among commercial divers and military divers, the times to wait before boarding a commercial plane varies from 2 to 24 hours.

In 1989, the first "Flying After Diving" workshop was held; organized by the Undersea and Hyperbaric Medical Society. The guidelines provided at the workshop, according to DAN, were not very restrictive and were implemented to improve diving safety. However, many of the dive center owners protested, saying that such implementation would damage dive center affairs on islands.

From 1992 to 1999, DAN carried out experiments in Duke University Medical Center's F.G. Hall Laboratory, monitoring over 500 subjects in 800 flight simulations. They were simulations because these "flights" took place in a hyperbaric chamber. DAN further investigated the relationship between the risk of decompression illness and the surface interval before flying in a case controlled study, an analysis of past events where incidents occurred or did not occur.

However, in many areas of medicine, laboratory studies have yielded, and can yield, results that differ from those obtained in "the field." Also, some phenomena cannot be replicated in the laboratory. You can find evidence of this discrepancy in an article published by Alert Diver (European Edition, 3/2006) by Dr R. Vann: "Flying or reaching high altitudes after multiple dives over a span of days cannot be an object of study in a laboratory (hyperbaric chamber)."

In 2011, while returning from a research trip in the Maldives, Dr. Danilo Cialoni and Massimo Pieri, both part of our research department (Diving Safety Laboratory), had a fascinating idea that would involve DAN Europe Research (in particular Prof. Alessandro Marroni and Prof. Costantino Balestra): a research project that sounded like a challenge… to administer cardiac echoes directly during a flight proceeding a diving trip.

### CARDIAC ECHO IN FLIGHT

Conducting such a challenge was difficult, almost impossible, especially getting through all the red tape. In this, two DAN partners, Albatros Top Boat and Neos Air, were fundamental. In order to obtain the EMI (Electro Magnetic Interference) certification, necessary to use the echo during flight, DAN Europe technicians and researchers had to spend many hours of the night at the Milan Malpensa Airport. In the end, the challenge was overcome, and for the first time, we were able to see what really occurs in the body of a diver during flight.

In just the first week of research in the Maldives, over 4,000 files were registered, which has obviously been followed by a long and accurate analysis.

The methodology of cardiac echo monitoring consists of four control phases. The first takes place during the outbound flight when the diver has not been on a dive in at least 48 hours. These first tests are useful to have data that has not yet been influenced by hyperbaric exposure, and to determine what in medical jargon is referred to as the "echocardiographic window." Registering an accurate measurement of the cabin pressure every 15 minutes is made possible by using the Dive System "iDive Pro" dive computer, a partner of DSL and DAN Europe.

In the second phase, echocardiography and other tests are administered after each dive over the span of a week on a cruise. Weeks of

specific research become part of the regular rhythm onboard the beautiful "Duke of York" cruise ship; not so dissimilar to a normal cruise to the Maldives, but with a routine of scientific importance: Each time a diver surfaces, he/she must go to the spa, which, for the occasion, has been transformed into a "research room" and medical care center, and undergo various tests.

Dive profiles are checked by the computer and downloaded for the following tests. All the dives are done within the safety curve, surfacing happens at the correct speed, and a safety stop of 3 minutes at about 5 metres depth is always respected. None of the divers have ever suffered decompression illness.

The third control phase takes place in the airport, where cardiac echoes are taken of the divers right before boarding the plane, after a 24 hour surface interval.

In the final phase, during the inbound flight, all divers are monitored by cardiac echo and doppler exactly 30, 60, and 90 minutes after the aircraft reaches cruising altitude.

## DATA ANALYSIS

The research project was presented in 2013 at the EUBS (European Underwater and Baromedical Society) conference, and received the Zetterström Award for the best scientific poster presentation.

Some of the collected data is easy to understand. For example, during examination on the outbound flight no bubbles were observed in any of the divers participating in the study. Although it seems like an obvious result, this test needed to be done because it gives proof that if bubbles were to be found in the divers during the return flight, they would not have been caused by the flight itself, but by the combined effect of diving and subsequent depressurization in flight.

Other data revealed by the study was unexpected. For example, it has always been believed that a flight of long duration poses greater risk in respect to a flight of medium duration; instead it is exactly the opposite. This is most likely due to the altitude of the aircraft pressurization, approximately 1500-1800 metres above sea level for travel to the Maldives, and 2400 metres above sea level (maximum allowed) for trips to closer destinations.

The examination of divers in the airport before the return trip, in which no bubbles were observed, has allowed us to estimate that an interval of 24 hours wait time is sufficient when remaining at sea level, so no bubbles can form.

Obviously, some divers develop more bubbles than others, even for those with very similar dive profiles. The examinations during the week on the cruise allowed the subjects to be divided into three categories: those who do not develop bubbles, those who occasionally develop bubbles, and those "bubble-prone" divers who develop bubbles after every dive. To obtain a consistent comparison, the dive profiles must have little influence on the categorization (it is obvious that a weighty profile can show more bubbles than a light one).

The analysis in flight has revealed that the majority of divers did not develop bubbles during the return flight with a 24 hour interval after the last dive, but the "bubble-prone" divers did. Therefore, it's advisable that those who are a part of this category should further elongate their wait time before a flight. During the week, two of the subjects showed to be "super bubble-prone," and they were advised to not take their last dive, making their wait time before flying 36 hours. It's of significance that neither of the divers developed bubbles during the flight. For those who easily develop bubbles, a wait time of over 24 hours is opportune. Alternatively, DAN Research suggests the preventative measure of breathing normobaric oxygen.

The highest bubble levels were seen 30 minutes after reaching cruising altitude, and then diminishing during the 60 minute to 90 minute period; basically like how it is returning to the surface after a dive. On the other hand, depressurization acts like surfacing and yields the same effects. As time passes at that altitude, the body desaturates, and the bubbles diminish. There is another possible explanation: the tiny bubbles are already present in the blood, but are so small that they cannot be observed with a normal Echocardiogram. The depressurization could increase their dimensions and render them more visible.

What future outcomes could this study entail for divers? As stated by Prof. Alessandro Marroni, "We are headed straight toward a future where the individual component can influence the mathematic model, placing greater emphasis on the practical application of research in diving safety. Until today, we have applied mathematics, with its present algorithms, when studying the body, but today we are starting a new, fascinating pathway that will help to incorporate simple physiological parameters in mathematics, rendering those algorithms better adapted to our organism. The future lies ahead, and DAN Europe has decided to take it on in the best way possible, with the help of divers; making them aware of current and future advancements.

# UPCOMING EVENTS

## DIGITAL ONLINE 2016 OPEN FOR SUBMISSIONS

3 January 2016 - 28 April 2016 | Email: photo@emiratesdiving.com
Follow the rules and guidelines on page 51.

## DIVE MIDDLE EAST EXHIBITON (DMEX)

1-5 March 2016 | Dubai International Marine Club Mina Seyahi

## DIGITAL ONLINE 2016 AWARDS & EXHIBITION NIGHT

25 May 2016 | 19:00-22:00 | Rotunda Gallery, American University in Dubai



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جمعية الإمارات للغوص
Emirates Diving Association



### MISSION STATEMENT

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

### LEGISLATION

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

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


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OFFICIAL PUBLISHER
ITP CUSTOMER PUBLISHING

CO-LOCATED WITH
معرض دبي العالمي للقوارب
DUBAI INTERNATIONAL BOAT SHOW