

Inspiring People to Care About our Oceans Since 1995

DIVERS FOR THE ENVIRONMENT

WWW.EMIRATESDIVING.COM | MAGAZINE | JUNE 2014 | VOLUME 10 | ISSUE 2



DIGITAL ONLINE 2014

UNVEILING UAE PHOTOGRAPHY TALENT

**REEF CHECK TRAINING • ELASMOS RESEARCH AND CONSERVATION • PROJECT BASELINE
DUBAI • AL MARSA MUSANDAM – THE CRUISING SPECIALIST • GOING PRO • DMEX 2014**



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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 September 2014. Send all articles, feedback or comments to: magazine@emiratesdiving.com

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PHOTO BY MOHAMED ABDULLA



OUTDOORUAE

MIDDLE EAST'S OUTDOOR, ADVENTURE TRAVEL & LIFESTYLE MAGAZINE

There is more to do
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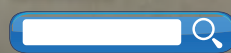


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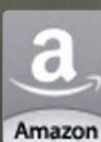
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IN THE SUMMERTIME



IBRAHIM N. AL-ZU'BI
EDA Executive Director

Welcome to the June issue of 'Divers for the Environment'. Time certainly flies and with the first half of 2014 already done and dusted, the team at EDA as always have been super busy. Summer has now officially started and June is the pivotal month where the temperatures in the UAE hit the late 30°C and early 40°C. The temperatures may be rising outside, but things are certainly heating up for the EDA team indoors too, with plenty of planning going on for some upcoming events and activities for the remaining half of the year.

Last month, we held our annual Digital Online Underwater Photography Competition which is now in its 6th year cycle. I thank my lucky stars that I was not a member of the jury panel because this year was one of the toughest to score with lots of underwater photography gurus participating and sending in amazing photos of the varied marine life from all the places our members have dived. If I were to describe all the entries we received this year in just one word, it would simply be, 'Inspiring'. During the Digital Online Awards Ceremony, which was held at the American University in Dubai (AUD), I spoke with one of this year's winners who had not won in the 2013 competition. He has honed his skills and worked on his photography so that he would have a chance to win against other talented competitors this year and he succeeded. He mentioned how the competition has inspired him to stop spear fishing and to replace his spear gun with an underwater camera instead. This was music to my ears and encouragement to always continue our competition. I want to congratulate all the participants for enriching EDA's photo library with such amazing imagery – I am sure you will all agree with me when you see the photos in this issue. I also want to thank the judges, the sponsors and the EDA team for another successful EDA event towards promoting the beauty of diving, not only in the UAE, but the whole region.

As you all know, EDA is an official Reef Check Training Facility in the UAE so we allocate a separate section for our Reef Check News in the magazine! We hope you will enjoy the updates and research regarding the conditions of the coral reefs in our seas!

Looking back, not only in the last six months but from the last 19 years of EDA, it makes me proud to remember how we have managed to pioneer voluntary work in diving and evolve our passion to creating a dedicated organization for diving and marine conservation. More than 2000 passionate and dedicated members care for our sea and the underwater marine life. The expertise in the area have been key factors in our success in making EDA a hot organization on the

national, regional and international level.

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 your trips. We hope your passion and enthusiasm continues and you continue to send us news about your next diving adventures. We look forward to seeing your next batch of waterworld snaps!

Enjoy reading this issue of 'Divers for the Environment'. We have a busy 6 months of activities and events waiting for you. The EDA team is working tirelessly to have another successful year and we're looking forward to seeing you at the next EDA events.

Happy reading and safe Diving!

Enjoy the summer!

Ibrahim Al-Zu'bi

AN EDA SOCIAL WITH VOX CINEMAS DISNEYNATURE EARTH

To celebrate Earth Day, EDA and VOX Cinemas screened DisneyNature Earth in Mercato Mall on Wednesday 23rd of April.

SYNOPSIS: An epic story of adventure, starring some of the most magnificent and courageous creatures alive. DisneyNature brings you a remarkable story, narrated by James Earl Jones, of three animal families on a journey across our planet – polar bears, elephants and humpback whales.





Disney nature earth



To celebrate Earth Day,
EDA & VOX Cinemas are showing a movie screening for our members!

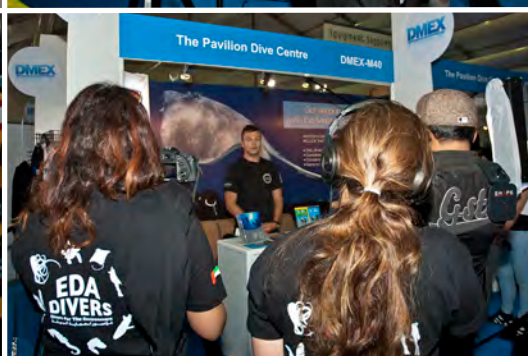


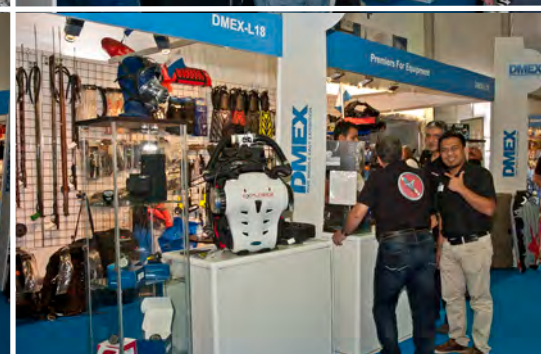
DIVE MIDDLE EAST EXHIBITION 2014

DMEX 2014, held at the Dubai International Marine Club, Mina Seyahi was on the 4-8 March this year. Maintaining its exclusive

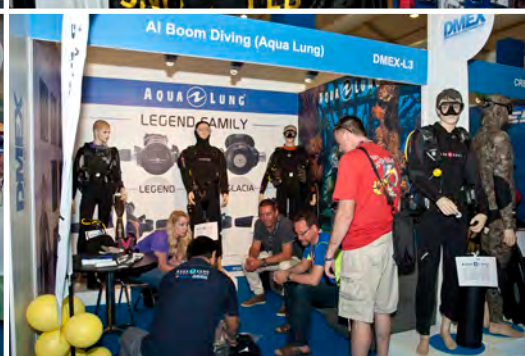
position as the only dive exhibition in the Middle East, 2014's exhibitor attendance represented over 100 of the world's leading

brands. Overall, the Dubai International Boat show 2014 welcomed 26,813 visitors from 120 countries. Here is a recap of the event.

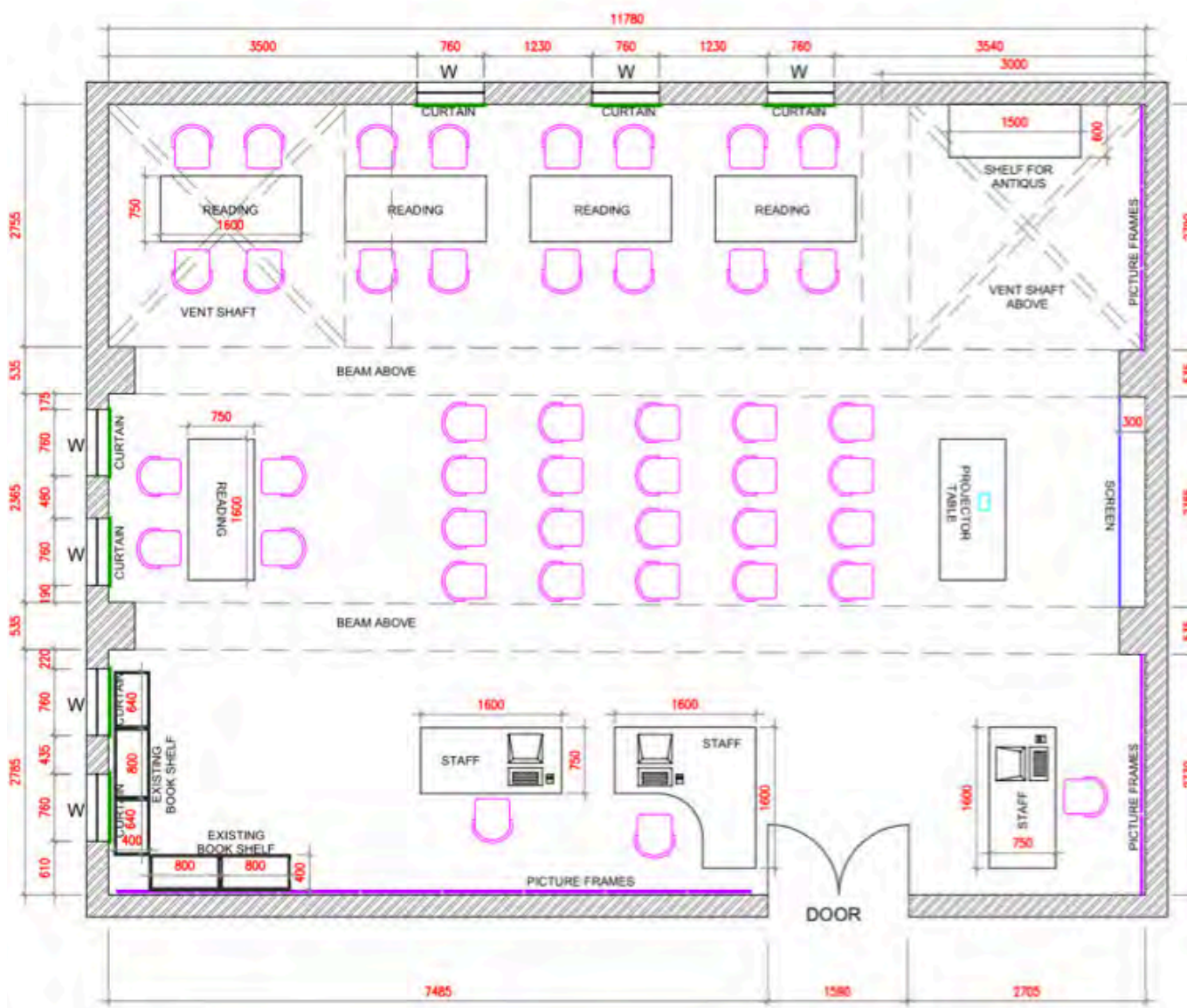








EDA'S OFFICE MAKEOVER GIVE AND GAIN – 15th MAY 2014



Give & Gain Day is a global day of employee volunteering. In Dubai, Dubai Chamber matches companies to projects in the community that employees can volunteer to and make a difference. The idea is that employees give their time and in return gain experience and skills.

Dubai Chamber contacted EDA to submit a proposal for a project that companies can get involved in on the 15th May. This could be anything from marketing, to administration support, to hands on volunteering such as a beach clean-up. After much thought, we created the perfect proposal, one which will have numerous beneficiaries and will be a sustainable project – An EDA Awareness Hall!

We have a large empty hall at our offices in the Diving Village which is currently not

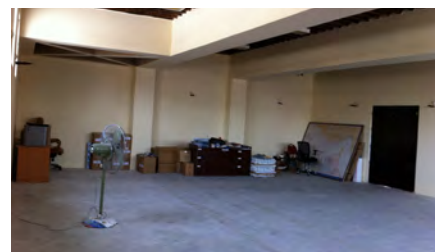
utilised. This hall has great potential to be a space where we can give presentations and trainings, give volunteers an area to read and learn. We have a vast collection of books which we would like our members to have access to. All in all, the hall can be a great awareness and learning space.

After submission, we received an email saying that our project was picked up by AF Carillion! This was very exciting as they have the knowledge and expertise in building, design and architecture. A meeting was set up to discuss the possibilities for the room and the ideas flowed on what we could have and how things could be placed.

On the 15th of May, the designers visited our hall and presented us with a booklet of different design ideas. They were all fantastic, and option 2

was our winning choice. Not only did AF Carillion submit a design for us, they also very kindly donated 7 desks and 41 chairs for the hall! We are very thankful for their generosity and time. What a great initiative from Dubai Chamber and a wonderful contribution by AF Carillion!

Here is a look at the Hall before its makeover. Stay tuned to see the results in the September magazine issue.



IN SEARCH OF THE NUDIBRANCH

FEATURE AND PHOTOGRAPHY **ANDREW ROUGHTON**



Nudibranchs are found the world over and are commonplace in the Emirates both in the Arabian Gulf and the Persian Gulf – although the former is likely to host far more. And whilst they are most abundant in warm, shallow reef systems, they can be found from the intertidal zone to over two-thousand five-hundred meters depth.

The body of these remarkable little creatures varies hugely – from twenty to six hundred millimeters in length. Nevertheless, because they are opistho-

Like most divers, I love to see big marine animals – sharks, rays and turtles are always a real joy to observe. However, in recent years, two things have made me change my diving style, slow down and search for smaller marine animals. One is budding-up with professionals and two is photography.

In budding-up with your dive club's instructor or dive master, you will usually experience an antithetical dive to the experience of diving with a newly qualified open water diver. That is, the pace will be slower, your air consumption reduced and your observational skills improved. This is usually because experienced, professional divers know the wealth of smaller marine life that can be found hiding in the reefs or kelp beds if you approach them slowly, take your time, and keep your eyes peeled.

This approach also lends itself to successful photography. If you zip around like an underwater race horse, you will not only miss the opportunity to really observe the ocean's animals, you will miss the opportunity to capture them on camera. And whilst sharks, rays and turtles can make for wonderful photographs, if you're lucky enough to get close and not scare them off, the smaller, stationary animals can be a lot easier and in their way just as interesting to capture on camera. One such aquatic gem is the nudibranch.

The nudibranch is often referred to as the sea slug, but this is a common misconception. Genuine sea slugs belong to various taxonomic groups that are not closely related to nudibranchs. In fact, the nudibranch is a member of a group of over three-thousand species of soft-bodied, aquatic gastropod mollusks that shed their shells after their larval stage and are called *Nudibranchia*. These creatures are many and varied, but more often than not, boast extraordinarily striking colours, patterns and textures.

branches and have undergone secondary derosion, unlike many other gastropods, they are bilaterally symmetrical – both internally and externally, which accounts (to some degree) for their aesthetic and photographic qualities. However, it's their magnificent colours that really provide their visual appeal.

During the course of their evolution, nudibranchs lost their shells and developed alternative defense systems. Some evolved external anatomies with colors to imitate local flora and thus avoid predators. Others developed profoundly bright and contrasting color patterns to make them intentionally conspicuous in their surroundings in order to warn potential predators that they are distasteful and/or poisonous. Either way, they are a marvel of evolution and a joy for any diver to behold.

Now, although I take great joy in finding and photographing nudibranchs, I'm not prompting an approach to diving that focuses exclusively on a quest to find the ocean's little critters. I'm merely suggesting that a slower, calmer, and more observational approach to diving can uncover hidden gems that we (perhaps) had no idea were there. In fact, I had one of my most memorable dives when I set out to find nudibranchs and found none at all. I was on the far side of Dibba Rock in Fujairah searching intently through the coral reefs when a dinosaur-sized animal slipped gracefully along side me.

It was an adult Whale Shark! And in order to keep up with him, I exhausted my remaining air supply and had to finish my dive, but it was worth it to spend two minutes in the presence of this aquatic giant – an animal that couldn't be more different from that which I was looking for, but yet perfectly demonstrated the eternal bounty, variety, and wonder of our endlessly beautiful oceans.



الفطيمه كاريليون

Al-Futtaim carillion

AL MARSA MUSANDAM –THE CRUISING SPECIALISTS

Al Marsa Musandam is a diving and cruising specialist, which offers all sorts of retreats. From short half-day excursions to six-day liveaboard dive trips. They explore Oman's dramatic northern Hajjar mountain range, Ru'us al Jibal, and its rocky coastline divided by fjords.

From breathtaking scenery to discovering spectacular underwater sea life: from night time fishing to exploring remote villages; sail along Oman's dramatic coastline in a dhow

with Al Marsa Travel Musandam.

Just 120km away from Dubai, this majestic retreat is ideal for short half-day excursions, longer full day trips and can extend to Live Aboard stays on vessels fully equipped (including satellite communication) with air conditioned cabins, large open sun decks and freshly prepared meals by the onboard cooks. Enjoy the ride with activities that range from the more leisurely to extraneous – including all the facilities for diving, snorkeling, fishing,

kayaking, and swimming. Explore the exotic marine species and dive into the wonders of the sea guided by a professionally trained and EFR/PADI certified crew member who will mentor you through beginner classes to open water diving courses and grant you a certification upon completion.

Oh those summer trips with Al Marsa Travel!

Escape the heat to find the perfect summer excursion with Al Marsa Travel, taking you on a retreat to Khor Qabel and Ras Musandam on their exquisite traditional dhows.

Amidst the majestic seas and the picturesque mountains is a revitalizing summer getaway where you can engage in the energizing water activities that include snorkeling, fishing, kayaking and diving. With a range of buffet food, snacks and refreshing beverages you are guaranteed a delightful feast after a day of fun-filled activities.

Between the months of July and August 2014, Al Marsa is offering discounted prices on their weekend and chartered trips.

Weekend trips range between AED 1360 and AED 1560 for two nights/per person.

For those of you with big families or big groups of friends, Al Marsa presents flexible chartered trips:

BROWN & BLUE DHOW

AED 7500/Night – max 12 people

RED DHOW

AED 7500/Night – max 15 people

YELLOW DHOW

AED 9500/Night – max 18 people

Rates are inclusive of food, beverages and all activities including diving fees and equipment. Dates upon request.

FOR MORE INFO CONTACT:

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OMAN: (M) +968 9 936 3732 or

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NEW INTERACTIVE MAP IS THE FIRST TO VISUALIZE UNDERWATER TRASH SCUBA DIVERS WORLDWIDE REMOVE AND REPORT MARINE DEBRIS FOUND BELOW THE SURFACE

An interactive map launched this week by Project AWARE, a global nonprofit organization, visualizes nearly three years of ongoing reporting by an international network of volunteer scuba divers who remove trash they find underwater through the Dive Against Debris program.

Dive Against Debris empowers scuba divers around the world to remove and report types and amounts of trash they find underwater. The web-based reporting platform enables divers to submit their data and images online. This information is now being shown on the new interactive Dive Against Debris map, shedding light on the growing marine debris problem that remains largely invisible to the wider public.

"Armed with the information, supported by people on the ground, and working in partnerships, we can drive much needed change for the ocean from two directions: bottom up and top down," said Ania Budziak, Associate Director of Science and Policy for Project AWARE. "Together, we can change what we produce, consume, and how we dispose of our waste. We can also influence policies necessary to improve how waste is managed locally, regionally and globally."

Our trash does not belong in the environment yet millions of tons of it enter the ocean each year. So far, the number one type of trash reported by Project AWARE divers is plastic — making up nearly 70 percent of the items. These include single use plastics we throw away everyday like bottles and bags that animals mistake for food as well as fishing line and nets that entangle marine life with devastating consequences. The map, which visualizes more than 400,000 items of debris reported so far, underscores why initiatives to reduce waste are so critical.

Project AWARE's new Dive Against Debris map represents the first opportunity to instantly visualize what is reported and where on a global scale. The organization hopes to use this information to target debris prevention initiatives, reduce the amount of rubbish entering the ocean and ultimately protect wildlife.

"As scuba divers, we're able to use our unique skills and knowledge to collect data to show the devastating impacts our waste has on life beneath the waves," said Budziak. "Project AWARE volunteers who remove and report underwater debris are members of a unique community that contribute to a clean and healthy ocean and also inspire us all to make ocean friendly choices every day."

View the map to see what divers are finding underwater and get involved at projectaware.org/DiveAgainstDebrisMap.





HILTON WORLDWIDE LEADS THE WAY

IN BIGGEST EVER VOLUNTARY UNDERWATER CLEAN UP TO MARK EARTH DAY 2014

HOSPITALITY GIANT PARTNERS WITH LOCAL DIVING VOLUNTEERS IN SECOND MAJOR RAS AL KHAIMAH SUSTAINABILITY INITIATIVE

Ras Al Khaimah, UAE – 21 April, 2014 –

Teams of enthusiastic divers from across the UAE joined forces with Hilton Worldwide in Ras Al Khaimah this weekend for the second underwater clean-up drive in conjunction with Project AWARE – created by the globally-known Professional Association of Diving Instructors' (PADI) to help protect the marine environment.

Over 50 divers from around the country geared up in wetsuits, dive equipment and tanks, trash bags and gloves to join the biggest volunteer programme of underwater clean-up in the country to help rid the sea off the Ras Al Khaimah coastline of debris and trash. Working in pairs, the dedicated teams

recovered over 200kg of trash in just one hour. The haul contained a range of discarded items including plastic bottles and bags, ropes, nets, and other forms of debris. Meanwhile, non-diver volunteers assisted on land to receive the team after their clean up and to assist in discarding the collected rubbish.

Mohab Ghali, Country Manager, Ras Al Khaimah, Hilton Worldwide said, "This year's underwater clean-up is one of the most high profile exercises in promoting sustainability ever seen in Ras Al Khaimah. The dedicated team of divers have a passionate interest in protecting their marine surroundings and I am delighted they have made such an impact in their second major initiative."

Hilton Ras Al Khaimah Resort & Spa sponsored and hosted the event with over 80 divers and volunteers together, ranging from beginners to instructors and spanning 20 different countries.

After the morning's clean-up, tired and hungry volunteers enjoyed a peaceful afternoon in the sunshine on the beach of the Hilton Resort & Spa where they enjoyed complimentary lunch and refreshments. A whole host of supporters donated various raffle prizes including hotel stays from all over the UAE, Salalah in Oman and even Seychelles, involving dining vouchers, spa, seaplane, cruises and more. The Adventure Sports Centre, the main partner of the event, provided the diving equipment, boats and



most importantly their invaluable experience throughout the process helped to safeguard the organisation of the event from boats to equipment, manpower and more.

In recognition of such an important eco-initiative, Hilton RAK Resort & Spa and PADI's Project Aware were awarded a prestigious USD\$5,000 Hilton Worldwide Travel with Purpose® Action Grant, to support their future efforts in marine conservation and to continue developing ways to strengthen the quality of life in Ras Al Khaimah.

Now in its second decade of underwater conservation, PADI Project AWARE supports an unprecedented global movement of divers acting in their own communities to protect oceans and helping to implement lasting change. Motivated by their recent successes, the local committee members have now created the Ras Al Khaimah Coastal Council to focus on the Emirate's beautiful 65km coastline

which is enjoyed every year by thousands of visitors coming to discover the city.

Emille Artigas, founder of the project commented, "Our message and passions are clear, and our sole purpose is to make a difference. We want to protect the fragile marine environment, share the importance of reef ecosystems and contribute to the longevity of this beautiful underwater kingdom. It's amazing to see that many share our passion and I applaud every member of the committee who dedicated their time and enthusiasm to this worthwhile cause."

The newly formed Ras Al Khaimah Coastal Council have lined up a series of conservation led initiatives for this year and will be calling on additional helpers to lend a caring hand throughout 2014 and 2015 to join in the building and funding of an artificial reef and also to protect baby turtles during the hatching time.



NO TIME TO “GO PRO”, THINK AGAIN.



Divers Down UAE has come up with a great way for those divers that want to take the next step and become dive professionals.

Paul Sant our PADI Course Director understands that not everyone is able to take days, even weeks away from work so they can achieve their dreams! So he has made it easy for you all and created the “Go Pro Club!”

The club runs from Divers Down Dubai at Riva on the Palm, the perfect location, central, easy to get to, fantastic facilities and ideal for training.

Once you have signed up, had your course orientation and received your PADI materials, all you need do is decide from our annual calendar the days, half days, even the few hours that you can attend, then complete the program at a pace that suits you!

Divers Down Dubai offers you the opportunity to train alongside experienced dive professionals (your mentors) as well as real life students ranging from 8-year-old bubble makers to Instructor candidates. Expect to gain a minimum of 25 logged training

dives throughout your program, as well as plenty of confined water (pool) sessions, covering a range of PADI courses.

SO WHAT MAKES IT A CLUB?

Simple we want YOU to feel special, have FUN and meet fellow Divemasters who share your dream and passion for diving. You make it a club; we are only here to facilitate your dreams!

YOU WILL RECEIVE:

- A limited “Go Pro Club” T-shirt
- 10% off food and beverages at Riva
- 10% off your Instructor Development Course
- A Free Divers Down UAE loyalty tag
- 10% off PADI material
- Free internship on completion

There you go, Paul indeed has made it easier for you! Now all you need to do is get in touch, commit to your dream and enjoy the ride!

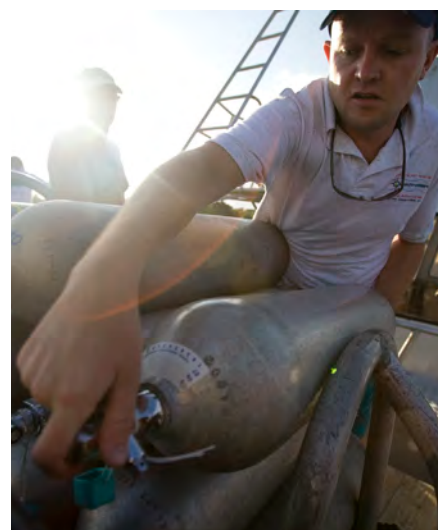
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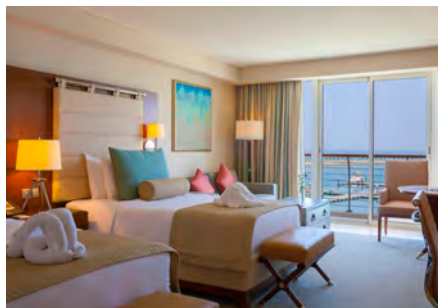
WEB: www.diversdowndubai.com

WEB: www.idcmiddleeast.com

FACEBOOK: Divers Down Dubai



DIVE INTO PARADISE AT MILLENNIUM RESORT MUSSANAH



Millennium Resort Mussanah is the ideal weekend escape for relaxation and recreation in Oman, approximately 3½-4 hours driving time from Dubai or Abu Dhabi, or 45 minutes from Muscat International Airport. Just one hour from the best dive sites in Oman, including the protected Damaniyat Islands marine nature reserve and Kharabah Island, Oman Sail's PADI Dive Centre is located within the Millennium Resort Mussanah.

A purpose-built dive vessel powered by twin 315 horse powered engines ensures a fast, safe and comfortable passage for both divers and snorkelers. Divers can expect to find healthy and hard corals, a large variety of schooling fish, moray eels and tropical reef fish; eagle and

mobula rays can be expected between May and October; with leopard sharks also visiting Oman's waters. The annual migration of tuna and sail fish occurs in May and June – an awe inspiring sight.

With courses ranging from Discover Scuba Diving to PADI Dive Master Courses for adults, PADI Bubblemaker and Seal Team courses for children from 8 years, or Junior Scuba Diver / Junior Open Water Diver courses for those aged 10 and above, the entire family can become involved.

A family and sports oriented resort, the hotel features 234 spacious and well-appointed rooms and suites with views of the Al Hajar Mountains, Marina and the Gulf of Oman, boasting a wide range of regional and international culinary delights in three restaurants, plus a poolside bar and Shisha lounge.

74 luxurious studios, 1 and 2-bed apartments and duplexes, each with fully equipped kitchen overlook the private Marina, offering the ideal accommodation for longer staying guests or families seeking that additional space and privacy whilst enjoying full hotel facilities.

With its own 54 berth marina managed by

Oman Sail, the hotel is located in the South Batinah Region of Muscat along the Gulf of Oman, on a private beach surrounded by date trees. Facilities include Beach Club with signature Zayna Spa, fitness centre equipped with the latest Technogym products, outdoor fitness park with Fitness Track, 2 floodlit tennis courts, and an 18-hole mini golf, plus a fully supervised Kids Club.

Oman's first ladies-only fully shaded, temperature controlled swimming pool and Jacuzzi, 2 infinity pools, Olympic-size leisure pool and kids splash pool ensure plenty of opportunity for guests to cool off.

Oman Sail overseas the resort's sailing and water sport activities including sailing, powerboat trips, Banana Boat rides, Kayak hire and Stand Up Paddle Boards. The hotel's Dhow is also available for private or group cruises by the hour.

With promotions such as 'Enjoy 15% off best available rate via www.millenniumhotels.com when you stay 3 nights or more' to Last Minute for Less with 10% discount for last minute reservations, special Summer Promotions and Spa Experience packages, Millennium Resort Mussanah has an offer to suit all interests and budgets. For Reservations contact reservations@mill-mussanah.com or call +968 268 71555.

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NEW HARD CORAL SPECIES REPORTED IN HONDURAS

FEATURE **PATRICK SCAPS** AND **JAMES SAUNDERS**



Healthy reefs were observed around Cayos Cochinos islands.

New data collected on coral reefs in Honduras has reported one new species and several new forms of hard corals. The coral reefs of Utila, Cayos Cochinos and Rio Esteban were visually inspected in summer 2010 to collect data on hard coral species abundance and richness (Scleractinia, Milleporidae and Stylasteridae) from the different Marine Research Sites operated by Operation Wallacea on the north coast of Honduras.

One species and four forms of Zooxanthellate scleractinian corals were new records from Honduras.

The Caribbean coastline of Honduras, Central America, represents the southern end of the Mesoamerican Barrier Reef System although its hard coral fauna is much less studied than nearby Belize and Mexico. During the summer of 2010 coral reefs around Utila, the mainland adjacent to Rio Esteban and the Cayos Cochinos islands were visually inspected by Dr Patrick Scaps from the University of Sciences and Technologies of Lille.

HEALTHY REEFS

Hard coral species richness and abundance appeared quite similar at Utila and Cayos Cochinos but were lower at Rio Esteban. At Utila 46 species and 12 forms of zooxanthellate scleractinian corals belonging to 21 genera were observed, compared to 44 species and 12 forms belonging to 20 genera at Cayos Cochinos, and only 32 species and six forms belonging to 15 genera at Rio Esteban.

At each site three species of milleporids and one species of *Stylaster* (*S. roseus*) were

also observed. An average of 37.1 species of zooxanthellate scleractinian corals was found per site at Utila, 33.4 at Cayos Cochinos and only 22.2 at Rio Esteban.

Most of the reefs at Utila and Cayos Cochinos were dominated by *Montastrea annularis*, *M. faveolata*, *M. franksi*, *Porites astreoides*, *P. porites*, *P. furcata*, *Siderea siderea* and *Agaricia agaricites*. Poorly developed coral communities were observed from Rio Esteban and the algae *Dictyota* spp. constitute the visually most

common sessile macro benthos. This can be related to the high level of sedimentation on that reef. Hard coral species observed at Rio Esteban are mainly species tolerating high sedimentation rates (*Siderastrea radians*, *Porites astreoides*, *P. furcata*, *Agaricia agaricites*, *Manicia areolata*, *Diploria clivosa*).

NEW SPECIES FOR HONDURAS

One species of zooxanthellate scleractinian coral (*Oculina varicosa*) observed only at Rio Esteban and four forms observed at Utila and Cayos Cochinos (*Agaricia agaricites* forma *carinata*, *Agaricia fragilis* forma *contracta*, *Manicia areolata* forma *mayori* and *Meandrina meandrites* forma *danaei*) have not been reported for Honduras in the published literature.

VERY RICH CORAL COMMUNITIES

Up to now the list of hard corals known from Honduras shallow waters comprises 54 species and 13 forms of zooxanthellate scleractinian corals, three species of *Millepora* and one species of *Stylaster* (*S. roseus*). The number of zooxanthellate scleractinian species found at Honduras is slightly higher than those reported from other western Caribbean reefs at Belize (51 species and eight forms) and Cozumel Mexico (49 species and eight forms). The 54 species of zooxanthellate scleractinian corals known from Honduras represent 95% of the approximately 57 zooxanthellate species known from the Caribbean.

The high hard coral diversity of Utila and Cayos Cochinos suggests that the reefs of the area are of high conservation importance.



Manicia areolata forma *mayori*, a new form of zooxanthellate scleractinian coral for Honduras

MANGROVES REVEAL MORE ROBUST CORAL SPECIES

FEATURE **ELSA NAUMANN, DAVID CURNICK, DR. DAVID J. SUGGETT AND PROF. DAVE SMITH**



Figure 1. *Porites lutea* coralliths with live, photosynthesising tissue on all sides (a) were found growing upon loose, sandy sediment (b) within the Lahoa mangroves. Photos by Elsa Naumann.

Studies into coral growth in extreme environments have revealed that some species are more robust than previously thought, and capable of withstanding light deprivation for many days.

Climate change and ocean acidification are global concerns, threatening to alter the conditions under which corals grow. Consequently, recent research has focused on identifying the environmental thresholds of coral growth, and whether certain ecological or physiological strategies allow some corals to exist over a wider range of conditions than others.

By studying coral assemblages growing under sub-optimal conditions, we can determine what species are better equipped to deal with environmental change and what strategies allow them to exist in these environments.

STUDYING SUB-OPTIMAL ENVIRONMENTS

Mangrove habitats, such as those found in Lahoa, within the Wakatobi Marine National Park in Indonesia, are considered sub-optimal environments for coral growth due to extreme daily fluctuations in light, temperature, tides and rates of sedimentation.

Nonetheless, coral assemblages are found to be thriving in the channels scattered across Lahoa.



Here, *Porites lutea* colonies that have adopted an unusual free-living growth strategy, producing what we term 'coralliths' (Fig. 1a, 1b).

Despite being half embedded in sandy sediment, these corallith colonies exhibited live, photosynthetically active tissue on all surfaces (Fig. 1a, 1b). We hypothesised that the flow within the Lahoa Mangrove is sufficient to overturn the coralliths from time to time, ensuring that all the tissue is exposed to light.

PHOTOSYNTHETIC CAPABILITY

In lab experiments, we found that the coralliths

are capable of withstanding periods of up to 30 days of extreme light deprivation (ie starvation) on unexposed sides.

The combination of this extreme tolerance and suitable environmental conditions, such as high flow oxygenating the sediments in which they are embedded, allows *Porites lutea* to occupy a highly specialised niche within a marginal environment.

This suggests that some coral species are able to withstand far more extreme conditions than is generally perceived.

REEF CHECK TRAINING (FROM A STUDENT'S POINT OF VIEW)

GET SKILLS AND EXPERIENCE TO ACCURATELY COMPLETE A REEF CHECK COURSE IN YOUR REGION

FEATURE AND PHOTOGRAPHY **NICOLA DE CORATO** – ADMIN OF DUBAIBLOG, DIVER & HELI RESCUE SWIMMER



Reef Check is part of an international network of volunteers that monitor the health of coral reefs in more than 90 countries, founded in 1996 by Marine Ecologist, Dr. Gregor Hodgson whose goals are to educate the public about the value of reef ecosystems and the current crisis affecting marine life; to create a global network of divers trained in Reef Check's scientific methods who regularly monitor and report on reef health; to facilitate collaboration that produces ecologically sound and economically sustainable solutions and to stimulate local community action to protect remaining pristine reefs and rehabilitate damaged reefs worldwide.

In 1997, Reef Check conducted the first-ever global survey of coral reef health. The basic idea behind the organization was to conduct surveys with the support of volunteer divers, optimizing the logistics of each survey and involving divers who probably know the area under inspection.

The first survey provided scientific confirmation that our coral reefs were in a crisis due to over-fishing, illegal fishing, and pollution.

The training can permit you to join teams in many locations around the world and provides invaluable experience in coral reef monitoring. Once you have completed a training course, you will be a qualified Reef Check Surveyor, able to collect data that is used in the creation of a Global and Regional/Local report regarding the status of the coral reefs and eligible to participate in as many of the survey

expeditions around the world.

Each Reef Check team collects four types of data for each dive site:

- A description of each reef site based on 30 measures of environmental and socio-economic conditions and ratings of human impacts.
- A measure of the percentage coverage of different substrate types, including live and dead coral.
- Invertebrates' indicator species count.
- Fish indicator species count.

During the training I learnt a lot about the importance of coral communities, basic reef ecology, our need to understand how reefs change with time and potential threats to their health from a global and a local perspective; the background on Reef Check and its importance in community monitoring worldwide; the various team tasks and responsibilities; and finally the survey methods to include the point intercept substrate method, belt transect invertebrate and impact method. I improved my underwater knowledge and skills and added something to my diving experience and I am finally able to recognize the underwater world around me (a lack of mine, up until that time). I started to feel a part of it.

I never liked the idea of diving just for fun. Ok discovering a new dive site is always fascinating, or coming back to a dive site you know little about and get to discover it better is great, but I always liked the idea of a real purpose to dive: a new certification, to write an article for a magazine or a blog and so on.

That's also the reason I became a rescue diver with my organization, getting involved in the powerboat championship for the water rescue activities.

Thanks to Reef Check, I got the chance to add a new purpose to my dives, while diving I contribute to preserve the ecosystem, I feel part of that world and part of a team, sharing my ideas and I get to do something useful for the global community.

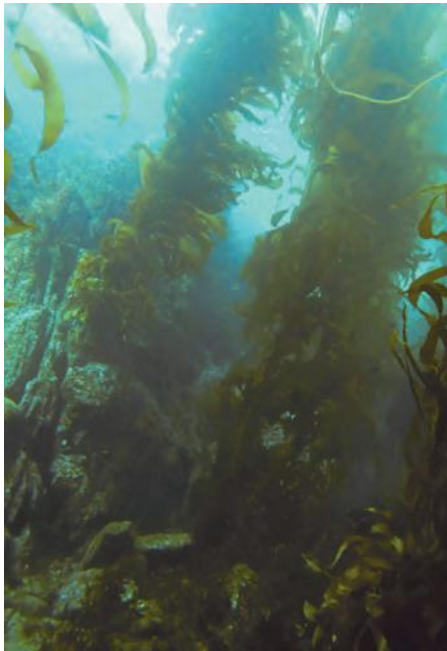
Until now, EDA has trained more than 50 divers for Reef Check. By dividing the divers into different Reef Check teams, they are able to collect data from several dive sites on the East Coast of the UAE, with particular focus in the Marine Protected Areas (MPAs) of Dibba, Al Aqah and Dadna. By collecting data every month, EDA will be able to write a report on the Status of Coral Reefs of the three MPAs on the East Coast. This report will make us understand the principal threats that our marine environment is facing at the moment and the actions that need to be taken in order to re-establish a healthy ecosystem in the area.

To join EDA's Reef Check training you only need to be a diver (of any level) with at least 15 dives in your log book; participants are required to have a minimum logged dives and have good buoyancy. They will perform a number of tasks to practice and demonstrate their buoyancy skills. Without it, they risk damaging the reef whilst diving close to the reef on inspection.

Ready to dive, Nico

THREE KELP COMMUNITIES DISCOVERED

BY REEF CHECK CALIFORNIA PHOTOGRAPHY CHRIS GLAESER



Reef Check California kicked off the 2014 training and survey season with the annual trainer and staff retreat on Catalina Island in February. For three days, we reviewed our 2013 accomplishments, made plans for 2014, and dove together to recalibrate our survey skills.

In 2013, we conducted 22 trainings and recertifications statewide and certified over 240 divers as Reef Check citizen scientists. These divers completed 70 rocky reef surveys from as far north as Trinidad in Humboldt County to San Diego in the south. The data collected during these surveys is now used to help manage marine protected areas (MPAs) along the entire California coast.

For example, Reef Check's report on the MPA baseline monitoring in the north central coast region was recently released by Sea Grant. Some of the key findings were the identification of three distinct kelp forest communities in the study region. Communities in the shallow and protected coves along the Sonoma County coast are different from communities around Point Arena, Mendocino. Physical aspects of reef substrate, the depths of the sites and the height of the relief mostly drive these differences. Community differences are especially apparent for species such as sea urchin, black or blue rockfish and striped perch. The detection of distinct communities suggests that long-term monitoring has to insure that MPAs in all respective communities are monitored because ecological processes and management actions might work differently in different communities.

Further, the data collected in collaboration with the monitoring program PISCO

(Partnership for Interdisciplinary Studies of Coastal Oceans), showed that red urchins declined by 1.5cm in mean size between 2010 and 2011. This is the time period during which a major invertebrate die-off occurred along the Sonoma County coast. Additionally, Reef Check's long-term data showed a red urchin population decline from 2007 to 2012 across all five monitoring sites in Sonoma County.

Recently, Reef Check was awarded a grant to help monitor baseline conditions of the MPAs in northern California, the last region where MPAs were implemented. We are currently accepting applications for a new North Coast Regional Manager position. For more on Reef

Check's baseline project and the other baseline monitoring teams, see Sea Grant's webpage at: <http://caseagrantsnews.org/2013/12/17/new-projects-to-take-snapshot-of-north-coasts-mpas/>

Our work in this region will focus on Mendocino County where we will establish new monitoring sites in and around at least five of the new MPAs. Beginning on May 3rd we will hold a Reef Check training in Fort Bragg to get local divers involved in the baseline monitoring project. The schedule for this and all other California trainings and recertifications can be found at: http://reefcheck.org/rccta/training_schedule.php



PHILIPPINE GOVERNMENT AGENCIES GET ECODIVER CERTIFIED

BY REEF CHECK PHILIPPINES



A NATIONAL COASTAL MANAGEMENT TEAM

Since the beginning of Reef Check Philippines in 2007, most teams being trained generally came from either the academic world or non-government organizations. However, in September 2013, ten participants from the Coastal and Marine Division (CMD) of the Biodiversity Management Bureau (BMB) under the Department of Environment and Natural Resources (DENR) began their Reef Check training. This was made possible through the sponsorship of the Philippine Coral Reef Resources Assessment and Conservation (PhilCore) Program as part of its capacity-building initiative.

The PhilCore is a program of the DENR that serves as the preliminary stage for a national assessment of the status of Philippine reefs. This is a basic step towards better management of local reefs. In the months that followed, different parts of the training (e.g. buoyancy, classroom sessions, practical tests) continued at various venues such as a dive resort in Mabini, Batangas, as well as the Marine Science Institute of the University of the Philippines. On January 24, 2014, the CMD-BMB team completed their training at De La Salle University's Br. Alfred Shields FSC Marine Station at Lian, Batangas, becoming only the second Reef Check Philippines team coming from a national government agency,

NEW MPAS FOR HAITI DECLARED

BY **REEF CHECK**



the first is detailed below. With this kind of national effort, the future of reef conservation in the country is now more promising.

PHILIPPINE COAST GUARD SAVES LIVES BY SAVING THE REEFS

The Philippine Coast Guard (PCG) is responsible for implementing laws within the jurisdiction of Philippine waters, ensuring the safety for seafarers, and performing rescue operations when necessary. In addition, they have been tasked to protect the marine environment and its resources. And so to further increase their knowledge about marine life, the Coast Guard Special Operations Group (CSOG) headed by Cdr. Inocencio "Jun" Rosario PCG underwent a Reef Check training last December 16-20, 2013 at the Ligaya Resort and Dive Center in Mabini, Batangas.

All twelve trainees successfully passed the three Reef Check EcoDiver modules, i.e. the reef fish, invertebrate, and substrate tests. This marked their certification as the very first Reef Check team coming from a national government agency as well as the first batch of PCG EcoDivers. According to Cdr. Rosario PCG, they look forward to having another batch certified in the 2nd quarter of this year.

CRUNCHING THE NUMBERS RC PHILIPPINES

RC Philippines has now completed 69 surveys at its 61 established sites – most of them are found in Batangas and Palawan. To date, RC Philippines has 209 certified EcoDivers with prospects of training more this coming summer. Moreover, RC Philippines now has 12 registered trainers. The organization has conducted 24 trainings, most held simultaneously in the summer of 2013.

For more information or to get involved with Reef Check in the Philippines, please contact Carina Escudero @ kcscudero@yahoo.com



Since 2010, Reef Check has been focused on educating university students in Haiti about coral reefs, training them as EcoDivers so that Haitians could participate in the first comprehensive survey of the country's coral reefs. We have also supported the government's efforts to design and implement a network of marine protected areas. So far, we have trained 30 Haitians to swim, snorkel, scuba dive and finally to become certified Reef Check EcoDivers. All have participated in surveys of over 1000km of Haiti's coast and coral reefs.

A key partner in this process has been Edward (EJ) Beuler, a graduate student at Harvard University with an interest in marine conservation. EJ's wife is Haitian and he speaks Creole, an indispensable skill working in rural areas. From the start of this project, he volunteered to help to design and carry out surveys and the training programs throughout the country. For his Masters Thesis, EJ mastered the intricacies of the MARXAN modeling program and Geographic Information Systems. Using these, he analyzed the survey data and came up with recommendations on which areas of Haiti would be best for Marine Protected Area status. Congratulations to EJ!

Our survey work on the reefs of Haiti has shown that previous assumptions about reef

conditions and impacts were often wrong. Although upland erosion is a huge problem due to poorly managed agriculture and forest conversion, most reefs in Haiti do not suffer from sedimentation impacts. Only a few areas have been damaged seriously by sedimentation. The major impact on most reefs in Haiti is simply overfishing. The overfishing is so bad that there are almost no fish on some reefs and most are highly destabilized due to a lack of herbivores and overgrowth by macro algae.

As far back as 1983, the Arcadine Islands were recommended for MPA status by foreign consultants including Dr. Marea Haziolos of the World Bank. Subsequently, Jean Wiener, a Haitian marine biologist based in the US, and Director of the Fondation pour la Protection de la Biodiversite Marine, recommended several other areas for MPA status. During the past three years, Reef Check Haiti has shared our findings with other NGOs, international development banks, the US Agency for International Development and the Ministry of Environment. By the end of 2013, the government of Haiti declared two sets of MPAs – one in the south and one in the north. Given the lack of capacity in Haiti with respect to designing and implementing MPAs, Reef Check Haiti and our EcoDivers are well placed to help the government to carry out these new plans.

REEF CHECK NAMED AS FINALIST FOR ST ANDREWS PRIZE FOR THE ENVIRONMENT

BY REEF CHECK



THE ST ANDREWS PRIZE
FOR THE
ENVIRONMENT

Following receipt of 488 entries from 101 countries, three finalists have been chosen for this year's prestigious St Andrews Prize for the Environment. The winner will receive \$100,000 USD and the two runners-up will each receive \$25,000 USD.

The Prize is a joint environmental initiative by the University of St Andrews in Scotland and independent exploration and production company ConocoPhillips, which aims to find practical solutions to environmental challenges from around the globe.

Sir Crispin Tickell, Chairman of the St Andrews Prize for the Environment Trustees, says: 'The purpose of the Prize is to find and reward entrepreneurs who come forward with original and practical ideas for coping with specific environmental problems. Such ideas must be designed to lead to action, be realistic, realisable and easy to be replicated elsewhere taking account of their social and economic implications. The world faces an intimidating array of problems unknown to previous generations and we need to remember how small and vulnerable we are as members of a particular species in a particular environment at a particular moment in time. Let us enjoy that environment as long as we can. The ideas and projects generated by the Prize help us all to do so.'

The finalists' presentations will be heard at a seminar at St Andrews University and the winner will be announced at a ceremony on Thursday, 1 May 2014.

THIS YEAR'S FINALISTS ARE:

BLUE VENTURES MADAGASCAR: AN INTEGRATED APPROACH TO CONSERVATION

This project is empowering coastal communities in southwest Madagascar to protect their marine environment and manage their resources sustainably by integrating holistic community-based reproductive health services within local biodiversity conservation initiatives.

Along Madagascar's southwest coast, semi-nomadic Vezo fishing people face extremely limited access to basic health services, with clinics located up to 50 kilometres from some villages.

Blue Ventures' project addresses this by training female community health workers to offer voluntary counselling and contraceptive options in the community, supported by a wide-ranging programme of community education. The project coordinates closely with marine conservation and coastal livelihood initiatives, engaging women in octopus fisheries management and sea cucumber farming.

This integrated model allows better provision for families; improves food security, empowers women and boosts local conservation efforts by allowing populations to achieve a more sustainable balance with the marine ecosystems upon which their livelihoods depend.

INGA FOUNDATION – LAND FOR LIFE PROGRAMME

This project aims to create sustainable rural livelihoods in tropical areas across the world, removing the need for farmers to slash and burn rainforests.

Worldwide, an estimated 300 million people rely on traditional slash and burn subsistence farming methods. Every year, each farmer clears a football pitch sized area of forest to create new nutrient-rich soil.

Inga alley-cropping is a tested and proven organic technique that, through the planting of Inga trees, enables an area of previously cleared, infertile land to regain the nutrients required to remain fertile, year after year.

Through providing farmers with hands-on training, Inga tree seeds and ongoing support to enable them to establish alley-cropping upon their land, the initiative creates a sustainable rural livelihood for farmers and their families, providing them with food security and the ability to grow cash-crops.

REEF CHECK – EMPOWERING LOCAL COMMUNITIES TO IMPROVE REEF HEALTH

This worldwide project trains coastal community members, including fishermen, to scientifically survey the health of coral reefs and to create non-extractive businesses that can provide a higher income than fishing.

Coral reefs contribute enormous value via fisheries, boating, surfing, recreational diving and tourist beaches as well as providing a food source for hundreds of millions of people. Coral reefs are threatened primarily by overfishing, pollution and climate change.

The simple, innovative and scientifically rigorous Reef Check method pioneers the use of citizen scientists, trained and led by professional marine biologists, to recognise 30 easy-to-identify 'indicator species' to measure the health of the broader reef ecosystem.

After the initial trial, the project invited the fishermen themselves to survey the reefs they were overfishing, enabling them to see the problems and to seek solutions.

So far, Reef Check has trained thousands of volunteers to survey over 4,000 reefs in 90 tropical countries and has helped set up many ecologically sound and economically sustainable marine protected areas.

NOTES

In 2014, the St Andrews Prize for the Environment is celebrating its 15th Anniversary. Over the years, the prize has consistently attracted entries on topics as diverse as sustainable development in the Amazon rainforest, urban re-generation, recycling, health and water issues and renewable energy.

Submissions are assessed by a panel of Trustees representing science, industry and Government, with the award going to the project the Trustees consider displays the best combination of good science, economic realism and political acceptability.

Find out all you need to know about the Prize:

www.thestandrewsprize.com

FEATURE CREATURE

SCALLOPED HAMMERHEAD (*SPHYRNA LEWINI*)

FEATURE **IUCN RED LIST 2013.2** PHOTOGRAPHY **DANIEL SELMECZI** AND **SIMONE CAPRODOSI**



RED LIST CATEGORY & CRITERIA: **ENDANGERED**

Scientific Name: *Sphyrna lewini*

Common Name: Scalloped Hammerhead

Justification: The Scalloped Hammerhead (*Sphyrna lewini*) is a coastal and semioceanic hammerhead shark that is circumglobal in coastal warm temperate and tropical seas, from the surface and intertidal to at least 275m depth. Although it is wide ranging, there is genetic evidence for multiple subpopulations. All life-stages are vulnerable to capture as both target and bycatch in fisheries: large numbers of juveniles are captured in a variety of fishing gear in near shore coastal waters, and adults are taken in gillnets and longlines along the shelf and offshore in oceanic waters. Population segregation and the species aggregating habit make large schools highly vulnerable to fisheries and means that high CPUEs can be recorded, even when stocks are severely depleted. Hammerhead shark fins are more highly valued than other species because of their high fin ray count, leading to increased targeting of this species in some areas. Where catch data are available, significant declines have been documented: both species-specific estimates for *S. lewini* and grouped estimates for *Sphyrna spp* combined suggest declines

in abundance of 50-90% over periods of up to 32 years in several areas of its range, including South Africa, the northwest and western central Atlantic and Brazil. Interviews with fishermen also suggest declining trends. Similar declines are also inferred in areas of the species range from which specific data are not available, but fishing pressure is known to be high. Although *S. lewini* is relatively fecund compared to other large sharks (with litters of 12-38 pups) the generation period is greater than 15 years in the Gulf of Mexico and its life-history characteristics mean that its resilience to exploitation is relatively low. Given the major declines reported in many areas of this species range, increased targeting for its high value fins, low resilience to exploitation and largely unregulated, continuing fishing pressure from both inshore and offshore fisheries, this species is assessed as Endangered globally.

In addition to the Endangered global assessment, a number of regional assessments have also been designated for this species as follows: Endangered A2bd+4bd in the Northwest Atlantic and Western Central Atlantic, Vulnerable A2bd in the Southwest Atlantic, Endangered A4bd in the Western Indian Ocean, Endangered A4bd in the Eastern Central and Southeast Pacific, Vulnerable in the

Eastern Central Atlantic and Data Deficient in Australia.

Northwest and Western Central Atlantic (including Caribbean Sea) Estimates of trends in abundance are available from two long-term research surveys conducted on the US east coast, both of which indicate this species has undergone substantial declines in this region (98% between 1972 and 2003, and an order of magnitude between 1975 and 2005). A third survey comparing catch rates between 1983/84 with those in 1993-95 showed a decline of two-thirds, while a survey beginning more recently showed increases in catch rates of juveniles. Standardized catch rates from the US pelagic longline fishery show declines in *Sphyrna spp.* Of 89% between 1986 and 2000 (according to the logbook data) and declines of 76% between 1992 and 2005 (according to observer data). The other information for this species from this region comes from Belize, where it has been heavily fished since the 1980s and fishermen have reported dramatic declines, which led to the end of the fishery. Fishing pressure is sustained in Belize by Guatemalan fishermen.

SOUTHWEST ATLANTIC



Sphyrna lewini faces two main threats related to fisheries in this region: 1) fishing of juveniles and neonates on the continental shelf by gillnets and trawl nets and 2) fishing of adults by gillnets (only in Brazil) and longlines on the continental shelf and oceanic waters, mostly for fins. Catches are inadequately recorded and landings data do not reflect the numbers fished and discarded at sea. The species is taken by fisheries throughout all parts of its life-cycle and greater demand for shark fins and flesh has resulted in a substantial increase in retention rates and targeting of sharks. In view of the intensive fisheries in the coastal and offshore areas where *S. lewini* occurs in this region and documented declining trends where the species has been heavily fished in other areas of its range, the species is assessed as Vulnerable in the Southwest Atlantic.

WESTERN INDIAN OCEAN

Catch per unit effort of *S. lewini* declined significantly from 1978-2003 in shark nets off the beaches of Kwa-Zulu Natal, South Africa, suggesting a 64% decline over this period. *Sphyrna lewini* is captured throughout much of its range in the Indian Ocean, including illegal targeting of the species in several areas. Landings reported to FAO in Oman, surveys of landings sites in Oman and interviews with fishermen there also suggest that catches of *S. lewini* have declined. The species faces heavy fishing pressure in this region, and similar declines in abundance are also inferred in other areas of its range in this region. Given continued high fishing pressure, observed and inferred declines, the species is assessed as Endangered in this region.

EASTERN CENTRAL AND SOUTHEAST PACIFIC

This species is heavily exploited through its range in the Eastern Pacific. Of particular concern is increasing fishing pressure at adult aggregating sites such as Cocos Island (Costa Rica) and the Galapagos Islands (Ecuador), and along the slopes of the continental shelf where high catch rates of juveniles can be obtained. The number of adult individuals at

a well-known *S. lewini* aggregation site in the Gulf of California (Espiritu Santo seamount) has declined sharply since 1980. Large hammerheads were also formerly abundant in coastal waters off Central America, but were reportedly depleted in the 1970s. A comparison of standardized catch rates of pelagic sharks (species-specific information was not available) in the EEZ of Costa Rica from 1991-2000 showed a decrease of 60%. In Ecuador, landings (grouped for the family Sphyrnidae) peaked in 1996 and declined until 2001. Illegal fishing for shark fins is occurring around the Galapagos. There are no species specific data for these fisheries, but *S. lewini* is one of the most common species around the Galapagos and given the high value of its fins, it is very likely being targeted. Divers and dive guides in the Galapagos have noted a severe decrease in shark numbers and schools of hammerhead sharks. Given continued high fishing pressure, observed and inferred declines, the species is assessed as Endangered in this region.

EASTERN CENTRAL ATLANTIC

Although there are no data on species-specific trends in abundance for *S. lewini* in this region, fishing pressure from pelagic longline fleets in this area is high and potentially comparable to that in the Northwest and Western Central Atlantic, where significant declines in abundance of *S. lewini* have been documented. The larger hammerhead shark, *Sphyrna mokarran*, is assessed as Critically Endangered in this region, from which it has apparently virtually disappeared. There is also concern for *S. lewini* in this area and although it is still present in the catches, catches are comprised entirely of juveniles in some areas. Given continued high fishing pressure throughout this species shelf habitat off Western Africa and the declining trends observed in other areas of this species range where it is fished, it is considered to meet the criteria for at least Vulnerable in this region.

AUSTRALIA

There has been a large increase in the illegal,

unregulated and unreported (IUU) fishing in northern Australia recently. Hammerheads are known to feature in the catches, and are suspected targets for their large valuable fins, although no specific data are available. Further study is urgently required to determine the status of *S. lewini* in this region.

Range Description: The Scalloped Hammerhead has a circumglobal distribution in coastal warm temperate and tropical seas (Compagno in prep).

WESTERN ATLANTIC

In the Western Atlantic the species ranges from New Jersey to Uruguay, including Gulf of Mexico and Caribbean Sea (A. Domingo pers. obs. 2007, Compagno in prep).

EASTERN ATLANTIC

This shark possibly occurs in the Mediterranean Sea and around the Azores. Probably present all along the western Africa coast, confirmed from Mauritania, Senegal, Gambia, Ivory Coast, Guinea, Guinea Bissau, Sierra Leone, Gabon, and Congo (Compagno in prep, M. Ducrocq pers. obs. 2006).

INDIAN OCEAN

Recorded from South Africa (Western Cape to KwaZulu-Natal), Maldives, and Red Sea to Pakistan, India, Myanmar (Compagno in prep).

WESTERN PACIFIC

In the Western Pacific, this shark occurs from Thailand, Vietnam, Indonesia, China (including Taiwan, Province of China), Japan, Philippines, Australia (Queensland, Western Australia), New Caledonia (Compagno in prep).

EASTERN PACIFIC

In the Eastern Pacific, the Scalloped Hammerhead ranges from southern California and Gulf of California to Panama, Ecuador and possibly northern Peru (Compagno in prep). Also Hawaii and Tahiti (Compagno in prep.).

Countries: **Native:** Angola (Angola); Anguilla; Antigua and Barbuda; Aruba; Australia (Queensland, Western Australia); Bahamas; Bahrain; Barbados; Belize; Benin; Brazil; Cameroon; Cape Verde; Cayman Islands; China; Colombia; Congo; Costa Rica; Côte d'Ivoire; Cuba; Djibouti; Dominica; Dominican Republic; Ecuador; Egypt; El Salvador; Equatorial Guinea; Eritrea; French Guiana; Gabon; Gambia; Ghana; Grenada; Guadeloupe; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; India; Indonesia; Iran, Islamic Republic of; Iraq; Jamaica; Japan; Kuwait; Liberia; Maldives; Mauritania; Mexico; Myanmar; Namibia; New Caledonia; Nicaragua; Nigeria; Oman; Pakistan; Panama; Philippines; Puerto Rico; Qatar; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Sao Tomé and Príncipe; Saudi Arabia; Senegal; Sierra Leone; South Africa; Suriname; Taiwan, Province of China; Thailand; Togo; Trinidad and Tobago; United Arab Emirates; United States (Alabama, California, Delaware, Florida,

Georgia, Hawaiian Is., Louisiana, Maryland, Mississippi, New Jersey, North Carolina, South Carolina, Texas, Virginia); Uruguay; Venezuela, Bolivarian Republic of; Viet Nam; Yemen.

FAO Marine Fishing Areas: Native: Atlantic – eastern central; Atlantic – northwest; Atlantic – southeast; Atlantic – southwest; Atlantic – western central; Indian Ocean – eastern; Indian Ocean – western; Pacific – eastern central; Pacific – northwest; Pacific – southeast; Pacific – western central.

Population: Recent studies indicate that the Northwest Atlantic, Caribbean Sea and Southwest Atlantic populations of this species are each genetically distinct from each other and from Eastern Central Atlantic and Indo-Pacific populations (D. Chapman and M. Shivji, Nova Southeastern University unpublished data). The boundaries between each population are not yet completely defined due to sampling constraints, but the “Caribbean Sea” population includes Belize and Panama and the “US Gulf Of Mexico” sample covers from Texas to south-western Florida, the boundary or transition zone will be in between Texas and Northern Belize (D. Chapman and M. Shivji, Nova Southeastern University pers. comm. 2007). Further studies are planned to obtain more samples from the Caribbean Sea. Adult site fidelity and annual homing to seamounts are known to occur in the Gulf of California (Klimley 1988, Klimley unpublished data).

Population Trend: Unknown

Habitat and Ecology: This is a coastal and semi-oceanic pelagic shark, found over continental and insular shelves and in deep water near to them, ranging from the intertidal and surface to at least 275m depth (Compagno in prep.). The pups of this species tend to stay in coastal zones, near the bottom, occurring at high concentrations during summer in estuaries and bays (Clarke 1971, Bass et al. 1975, Castro 1983). They have been observed to be highly faithful to particular diurnal core areas (Holland et al. 1993) and sometimes form large schools which migrate to higher latitudes in summer (Stevens and Lyle 1989).

Horizontal migration is observed from inshore bays to a pelagic habitat as the sharks grow. This species segregates by sex, with females migrating offshore earlier and at smaller sizes than males. In the Gulf of Mexico and northern Australia, it was observed that males less than 1m long were more abundant over the continental shelf, but females bigger than 1.5m dominated areas near the edge of the shelf. Adults spend most of the time offshore in midwater and females migrate to the coastal areas to have their pups (Clarke 1971, Bass et al. 1975, Klimley and Nelson 1984, Branstetter 1987, Klimley 1987, Chen et al. 1988, Stevens and Lyle 1989). Nursery areas are found in shallow inshore waters, while

the adults are found offshore (Compagno 1984, Holland et al. 1993, Kotas et al. 1995, Lessa et al. 1998). Neonates and juveniles are known to shoal in confined coastal pupping areas for up to two years before moving out to adult habitat (Holland et al. 1993). In the Northwest and Western Central Atlantic, the coastal area between South Carolina and central Florida is believed to be an important nursery area (Castro 1993). In southern Brazil, near-term gravid females migrate inshore to nursery grounds (at 2-10m depth; bottom water temperature of 20-24°C) and give birth in spring (November-February) (Dono et al. in prep., Vooren and Lamónaca 2003). Juveniles then remain between the shore and 100m depth (Vooren 1997, Kotas et al. 1998). In northern Brazil (latitude 3°S), this species appears to breed at a smaller size and have lower fecundity than reported elsewhere (Lessa et al. 1998).

Throughout the species range in the Eastern Pacific, parturition is thought to occur between May and July in shallow nursery areas (Ruiz et al. 2000, Torres-Huerta 1999). The northern Gulf of California and Bahía Almejas on the Pacific coast of Baja California Sur appear to be important pupping and possible nursery grounds.

The species is viviparous with a yolk-sac placenta. Only the right ovary is functional. In Taiwanese (POC) waters, ovum development takes approximately 10 months and ova reach a maximum diameter of 40-45mm. The number of oocytes in the ovarium can be as many as 40-50 per female (Chen et al. 1988). The gestation period is around 9-12 months, with birth in spring and summer. The average number of embryos in the uterus ranges from 12-41. Newborn size ranges from 31-57cm (Castro 1983; Compagno 1984; Branstetter 1987; Chen et al. 1988; Stevens and Lyle 1989; Chen et al. 1990; Oliveira et al. 1991, 1997; Amorim et al. 1994; White et al. 2008). Predation on pups and juveniles is high, mainly by other carcharhinids and even by adults of the same species. This is probably the most significant source of natural mortality on the population (Clarke 1971, Branstetter 1987, Branstetter 1990, Holland et al. 1993), and may explain, in evolutionary terms, the higher fecundity of this species compared to some other sharks.

Maximum size reported by different studies, ranged from 219-340cm TL for males and 296-346 cm for females (Clarke 1971, Bass et al. 1975b, Schwartz 1983, Klimley and Nelson 1984, Stevens 1984, Branstetter 1987, Chen et al. 1988, Stevens and Lyle 1989, Chen et al. 1990). Males mature between 140-198cm TL and females at around 210-250cm TL (Compagno 1984b, Branstetter 1987, Chen et al. 1990, Carrera and Martinez in prep., White et al. 2008). Branstetter's (1987) growth study in the Gulf of Mexico found asymptotic length for both sexes of 329cm TL and 253cm fork

length (FL), with an index of growth rate of $k = 0.073 \text{ y}^{-1}$. Piercy et al.'s (2007) more recent study used Fork Length (FL) rather than total length (TL) and suggested faster growth, with asymptotic length of 214.8cm FL for males and 233.1cm FL for females, with an index growth rate of $k=0.13 \text{ year}^{-1}$ for males and $k=0.09 \text{ year}^{-1}$ for females. It is unclear whether these differences are related to sample size, methodology or changes resulting from a density-dependent compensatory response to population depletion. In Ecuadorian waters, Carrera-Fernández and Martínez-Ortiz (2007) found that females matured at 225cm TL, reaching a maximum size of 302cm TL, and males matured at 190cm TL, reaching a maximum size of 282cm TL.

The age and size of first maturity has been studied in several different areas; the Gulf of Mexico, Western Central Atlantic, Taiwanese (Province of China) waters, Northwest Pacific and Mexican waters, Eastern Central Pacific. Branstetter (1987) estimated that males mature at 10 years, 180cm TL and females at 15 years, 250cm TL in the Gulf of Mexico. During a recent study by Piercy et al. (2007) on the age and growth of *S. lewini* in the Gulf of Mexico the oldest age estimate obtained was 30.5 years for both males and females. Whereas, Chen et al. (1990) estimated that males mature at 3.8 years, 198cm TL and females at 4.1 years, 210cm in Taiwanese Pacific waters and Anislado-Tolentino and Robinson-Mendoza (2001) estimated that males mature at 4.3 years and females at 5.8 years in the Mexican Pacific waters. Both studies in the Gulf of Mexico show that this species appears to grow more slowly and have smaller asymptotic sizes than reported in the Pacific Ocean. The vast differences in age and growth reported between Taiwanese Pacific waters/ Mexican Pacific waters and other oceanic regions may arise from different interpretation of vertebral band formation rather than true geographic variation (W. Smith pers. comm.). Current published age estimates of *S. lewini* from the Mexican Pacific and Taiwanese Pacific are based on growth estimates that assume the deposition of two centrum annuli per year (Chen et al. 1990, Anislado-Tolentino and Robinson-Mendoza 2001), whereas studies in the Gulf of Mexico assume the deposition of one growth band per year (Branstetter 1987, Piercy et al. 2007). The Pacific estimates have not been validated and the deposition of two centrum annuli has not been confirmed in any other shark species to date (W. Smith pers. comm.), therefore these estimates should be viewed with caution. Previous evidence of the deposition of two annual bands in the Shortfin Mako Shark (*Isurus oxyrinchus*), has not proven to be valid and this may be the case for *S. lewini* (Campana et al. 2002). If growth data presented by Chen et al. (1990) were converted to reflect a one growth band per year hypothesis, then the results of these studies would agree more closely. Validation of the periodicity of growth-band deposition

is required for both the Pacific and Atlantic populations to resolve this issue (Piercy et al. 2007).

Comparing different estimates for the values of k on *S. lewini* (0.054-0.160 yr⁻¹), by different authors, suggests that this is a medium growth species (Branstetter 1987). Smith et al. (1998) estimated the intrinsic rate of increase at MSY of 0.028.

Adult *S. lewini* feed on mesopelagic fish and squids. In certain areas stingrays of the (*Dasyatis* spp.) are the preferred food. Pups and juveniles feed mainly on benthic reef fishes (e.g., scarids and gobiids), demersal fish and crustaceans. (Bigelow and Schroeder 1948, Clarke 1971, Bass et al. 1975, Compagno 1984, Branstetter 1987, Stevens and Lyle 1989).

Systems: Marine

Major Threat(s): The Scalloped Hammerhead is taken as both a target and bycatch by trawls, purse-seines, gillnets, fixed bottom longlines, pelagic longlines and inshore artisanal fisheries. The latter catch large numbers of pups and juveniles in some regions. The species aggregating habit makes them vulnerable to capture in large schools. This also means that they may appear more abundant in landings, where they are caught in high, localised concentrations. Intense fishing pressure can deplete regional stocks rapidly, and re-colonization of depleted areas from neighboring regions is expected to be a slow and complex process. This species is expected to have a low resilience to exploitation because of its life-history characteristics (Maguire et al. 2006).

This species fins are highly valued and they are being increasingly targeted in some areas in response to increasing demand for shark fins. Hammerhead shark species *S. zygaena* and *S. lewini* were found to represent at least 4-5% of the fins auctioned in Hong Kong, the world's largest shark fin trading center (Clarke et al. 2006a). Hammerhead shark fins are generally high value compared to other species because of their high fin ray count (*S. Clarke* unpubl. data). It is estimated that between 1.3 and 2.7 million *S. zygaena* or *S. lewini* are represented in the shark fin trade each year or, in biomass, 49,000 to 90,000mt (Clarke et al. 2006b).

NORTHWEST AND WESTERN CENTRAL ATLANTIC (INCLUDING CARIBBEAN SEA)

In the USA this species is caught in both commercial coastal shark bottom longline and gillnet fisheries and the pelagic longline fishery, where it suffers high mortality (Piercy et al. 2007). It is also taken in recreational shark fisheries. The USA pelagic longline fishery has operated since the 1960s and encompasses the entire range of this species in the Northwest and Western Central Atlantic, from the equator to about 50°N. Although this is quite a fecund shark, its late age at

maturity in this region (15 years) will render it quite vulnerable to overexploitation and limit its recovery potential.

Estimates of trends in abundance of *Sphyrna* spp. are available from standardized catch rate indices of the USA pelagic longline fishery, from logbook data between 1986 and 2000 and from observer data between 1992 and 2005. The area covered by this fishery, ranging from the equator to about 50°N, encompasses the range of this species in these two regions. Although this fishery will not sample individuals closest to the coast, the sample size of hammerheads recorded in the logbook data (the majority of which are thought to be *S. lewini*) is substantial, with over 60,000 recorded during this period. This subpopulation of Scalloped Hammerhead sharks is estimated from the logbook data to have declined by 89% over the 15 year time period, from 1986-2000 (Baum et al. 2003), which is less than one generation. A more recent analysis of the pelagic longline observer data indicates that *Sphyrna* spp. declined by 76% between 1992 and 2005 (Baum et al. in prep.). The pelagic longline fishery has operated in these regions since the 1960s, thus declines from 1986 were certainly not from virgin population abundance.

Using logistic regression of *S. lewini*, Ha (2006) showed that the probability of capture in a fisheries independent sampling program off Virginia, USA, declined by an order of magnitude between 1975 and 2005. Species-specific trends in abundance are available for *S. lewini* from a shark-targeted longline survey conducted annually between 1972 and 2003 near Cape Lookout, North Carolina, by Dr. F.J. Schwarz at the University of North Carolina. Standardized CPUE from this research survey based on a sample size of 495 *S. lewini* indicates that it has declined by 98% over this 32 year time period (Myers et al. 2007). Off southern Carolina, Ulrich (1996) reported a 66% decrease between 1983/84 and 1991/95. In contrast to all other data, a more recent research survey (1989-2005) along the southeast US coast shows a significant increase in juvenile scalloped hammerheads (Myers et al. 2007).

Off the Atlantic coast of Belize hammerheads were fished heavily by longline in the 1980s and early 1990s (R.T. Graham pers. obs. 2006). Hammerheads are a favoured target species for their large fins. Interviews with fishermen indicate that the abundance and size of Sphyrnids has declined dramatically in the past 10 years as a result of over exploitation, leading to a halt in the Belize based shark fishery (R.T. Graham pers. obs. 2006). However, the pressure is still sustained by fishers driving into Belizean waters from Guatemala (R.T. Graham pers. obs. 2006). Fin prices are rising above US\$50/lb in the neighbouring countries of Guatemala, driven by Asian buyers, according to these interviews (R.T. Graham pers. obs.).

This species is probably caught in other fisheries but is usually placed in a combined "hammerhead" category. Species identification (*S. mokarran* vs. *S. lewini*) is a large obstacle in the proper assessment of this species. The high at-vessel fishing mortality for both species of hammerhead makes the threat of fishing high. *Sphyrna lewini* is also taken in various fisheries along the Caribbean coast of South America. It is taken in artisanal gillnet fisheries targeting mackerel off Guyana, Trinidad and Tobago and in pelagic tuna fisheries of the eastern Caribbean (Chan A Shing 1999).

SOUTHWEST ATLANTIC

The Scalloped Hammerhead faces two main threats related to fisheries in this region: 1) fishing of juveniles and neonates on the continental shelf by gillnets and trawl nets (Vooren and Lamónaca 2003, Kotas and Petrere 2002, Doño 2008); and 2) fishing of adults by gillnets (only in Brazil) and longlines on the continental shelf and oceanic waters, mostly for fins (Kotas et al. 2001, Kotas and Petrere 2002, Kotas and Petrere 2003, Zerbini and Kotas 1998). The species therefore faces intensive fishing pressure throughout its range in this area and at all points in its life cycle. Because all Brazilian fisheries statistics for hammerhead sharks are grouped under the headings 'shark' or 'hammerhead shark', it is not possible to determine species-specific trends. Annual landings of hammerhead sharks (six species of hammerhead sharks occur off Brazil) in the ports of Rio Grande and Itajaí (Brazil) combined increased rapidly from ~30 t in 1992 to 700 t in 1994, after which catches decreased, fluctuating between 100-300 t from 1995-2002. The majority of this catch was taken by surface gillnet fisheries that targeted hammerhead sharks on the outer shelf and slope between 27° and 35°S (Kotas 2004, Vooren et al. 2005). Neonates and small juveniles are caught in coastal waters by directed gillnet fishing and as bycatch by bottom trawls (Vooren and Klippel 2005). In the inshore nursery area (depths down to 10m), neonates are fished intensively by coastal gillnets and are also caught as bycatch by shrimp trawl, pair trawl and intensive recreational fisheries. Their abundance in coastal waters has decreased markedly as a result (Haimovici and Mendonça 1996, Kotas et al. 1995, 1998, Kotas and Petrere 2002, Vooren and Lamónaca unpublished data). Finning of hammerhead sharks, with discarding of the carcasses at sea, is often practised (Kotas 2004, Vooren and Klippel 2005). Fisheries statistics only refer to the landed carcasses and therefore the true extent of catches is unknown.

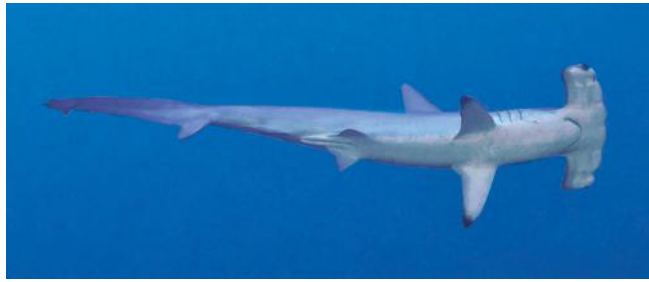
In southern Brazil and northern Uruguay, adult hammerhead catches (*S. lewini* and *S. zygaena*) by monofilament longliners are highest in winter and spring at the shelf edge and the continental slope between 30° and 35°S (Kotas and Petrere 2002). The Brazilian pelagic fishery based in Santos catches significant

numbers of sharks, including *S. lewini* (Amorim et al. 1998). Until 1997, most of this shark catch was discarded but greater demand for fins and flesh has resulted in a substantial increase in retention rates and targeting of sharks (Bonfil et al. 2005). Because hammerhead shark fins are highly valued for their high fin-ray count, this species is unlikely to be released alive. The artisanal fishing fleet in São Paulo has operated since 1996 and also takes sharks. The majority of the hammerheads caught by this fishery were newborns or juveniles (Bonfil et al. 2005). In Uruguay (oceanic coast) some neonates are also captured (together with *S. zygaena*) in artisanal gill nets, in summer (between December and February) (A. Domingo pers. obs. 2007). In view of the intensive fisheries in the coastal and offshore areas where *S. lewini* occurs in this region and documented declining trends where the species has been heavily fished in other areas of its range, the species is assessed as Vulnerable in the Southwest Atlantic.

EASTERN CENTRAL ATLANTIC

Data to indicate trends in abundance are generally not available for the Eastern Central Atlantic. Zeeberg et al. (2006) suggest that similar population trends for hammerheads (grouped) to those documented in the Northwest Atlantic can be expected in the Northeast and Eastern Central Atlantic because longline fleets in this area exert comparable fishing effort, and effort is seen to shift from western to eastern Atlantic waters (Buencuerpo et al. 1998, Serafy et al. 2004, Zeeberg et al. 2006). European industrial freeze trawlers targeting small pelagic fish (*Sardinella*, sardine, and horse mackerel) operate on the northwestern African shelf nearly year-round with five to ten large vessels (9,000-18,000 horse power). A study of bycatch rates in more than 1,400 trawl sets off Mauritania from 2001-2005, showed that *Sphyrna* species combined represented 42% of total bycatch during this period (Zeeberg et al. 2006).

Hammerheads are caught by both inshore artisanal fisheries and offshore European fisheries operating along the coast of western Africa. The Subregional workshop for sustainable management of sharks and rays in West Africa, 26-28 April 2000 in St Louis, Senegal (Anonymous 2000) noted the high threat to sharks in the West African region and a noticeable decline in the CPUE of total sharks and rays. Walker et al. (2005) also noted that there is concern for *Sphyrna lewini* off Mauritania, with catches comprised exclusively of juveniles, often newborn. Increased targeting of sharks began in the 1970s, when a Ghanaian fishing community settled in the Gambia and established a commercial network throughout the region, encouraging local fishermen to target sharks for exportation to Ghana. By the 1980s many fishermen were specialising in



catching sharks, resulting in a decline in overall shark populations (Walker et al. 2005). There has been rapid growth in the shark fin market in this region, for export to the Far East, and yearly production of dried fins exported from Guinea-Bissau alone is estimated at 250t (dry weight) (Walker et al. 2005).

This species is frequently caught along the western African coast and is heavily targeted by driftnets and fixed gillnets from Mauritania to Sierra Leone (M. Ducrocq pers. comm. 2006). There is anecdotal evidence for some declines in catches off Senegal and Gambia (M. Ducrocq pers. comm. 2006). Juveniles are very susceptible to coastal fisheries using drift or fixed gill nets such as sole, sciaenid and *Sepia* spp fisheries (M. Ducrocq pers. comm. 2006). They were taken as bycatch in the milk shark fishery and in the Banc d'Aguin national park, Mauritania, until the fishery was stopped in 2003 and they are still caught in large quantities in the Sciaenid fishery. A specialized artisanal fishery for carcharhinid and sphyrnid species was introduced in Sierra Leone in 1975, and since then fishing pressure has been continuous (M. Seisay pers. obs. 2006).

WESTERN INDIAN OCEAN

Reliable species-specific catch information is available for shark nets set off the beaches of Kwa-Zulu Natal, South Africa, in the southwestern Indian Ocean, from 1978-2003 (Dudley and Simpfendorfer 2006). Catch per unit effort of *S. lewini* declined significantly during this period from approximately 5.5km net/year to approximately 2/km net/year (Dudley and Simpfendorfer 2006). This fishery independent data indicates a decline of approximately 64% over a 25 year period. About 120 longline vessels were reportedly operating illegally in coastal waters of the western Indian Ocean prior to 2005, and this number was expected to increase (IOTC 2005). These vessels are primarily targeting hammerhead sharks and Giant Guitarfish (*Rhynchobatus djiddensis*) for their fins (Dudley and Simpfendorfer 2006). Illegal fishing by industrial vessels and shark finning are reported in other areas of the Indian Ocean also (Young et al. 2006). Dudley and Simpfendorfer (2006) also report large catches of newborn *Sphyrna lewini* by prawn trawlers on the Tudela Bank, South Africa, ranging from an estimated 3,288 in 1989 to 1,742 in 1992, with almost 98% mortality. An inshore, artisanal fishery that uses multiple gear types (including seine nets and gillnets) along the coast of Mozambique

and takes sharks as bycatch also potentially affects *S. lewini* (Dudley and Simpfendorfer 2006).

Sphyrna lewini is captured in various other fisheries throughout the rest of its range in the Indian Ocean. Few species-specific data are available from other areas, however, declines are also likely to have occurred in other

areas where this species is heavily fished. Other countries with major fisheries for sharks include the Maldives, Kenya, Mauritius, Seychelles and United Republic of Tanzania (Young et al. 2006). Sharks are considered fully to over-exploited in these waters (Young et al. 2006). Landings data are available from FAO for Oman since 1985. *Sphyrna lewini* is one of five dominant species in the catches of Oman. Landings of sharks for Oman varied between 2,800, 8,300t, since 1985, with peaks noted from 1986-1988 and 1995-1997. After 1997 landings continued to decline to under 4,000t in 2000 (FAO 2008). Oman has a long-established traditional shark fishery (Henderson et al. 2007). Henderson et al. (2007) surveyed landings sites in Oman between 2002 and 2003 and report a notable decline in catches of *S. lewini* in 2003, although the trend varied between areas. Henderson et al. (2007) note that large pelagic sharks such as *S. lewini* were displaced during 2003 by smaller shark species. Although it is possible that this is due to sampling bias, informal interviews with fishermen revealed a general trend of declining shark catches over the last number of years, particularly large pelagic species (Henderson et al. 2007). Artisanal gillnet and longline fisheries also target sharks off Madagascar for their fins, which are exported in the international shark fin trade. A study of directed shark fisheries at two sites in southwest Madagascar from 2001-2002 showed that hammerhead sharks represented 29% of sharks caught and 24% of the total wet weight, but species-specific data are not available because fishermen do not differentiate between *S. lewini* and *S. zygaena* (McVean et al. 2006).

Fishing pressure is also high in other areas of the Indian Ocean and Western Pacific, with many countries in this region among the largest shark fishing nations in terms of global catch in the world (Clarke and Rose 2005, SEAFDEC 2006). Indonesia has the largest chondrichthyan fishery in the world, with a reported 105,000 and 118,000 tonnes landed in 2002 and 2003 respectively (White et al. 2006). This species is a target and bycatch of shark longline, tuna gillnet fisheries and trawls in several areas of this region (White et al. 2006, SEAFDEC 2006). The species is utilised for its fins (high value in adults), meat, skin and cartilage (White et al. 2006, SEAFDEC 2006). White et al. (2008) suggest that this species is prone to overfishing in Indonesian waters, where substantial catches of *S. lewini* are taken in gillnet and longline fisheries. They

found that almost all of the *S. lewini* caught by gillnetting, and the majority caught by longlining, were immature, and were therefore removed from the population before they had the opportunity to breed. Inshore fishing pressure is intense throughout Southeast Asia and juveniles and neonates are very heavily exploited, with large numbers of immature sharks in catches in other areas also (SEAFDEC 2006). Foreign vessels are also reported to target sharks in eastern Indonesian waters (Clarke and Rose 2005). Given the marked declines in this species, abundance in areas for which data are available, there is every reason to suspect that declines have also occurred in other areas of the Indian Ocean and Western Pacific, where fishing pressure is high.

Japanese data on hammerhead species are limited, but reported landings in Japan's coastal ports totaled 11-34mt annually between 2000 and 2004 with an average of 24mt per annum. No CPUE trends are available (Japan Fisheries Agency 2006).

EASTERN CENTRAL AND SOUTHEAST PACIFIC

Throughout this species range in the Eastern Pacific, juveniles and neonates are heavily exploited in directed fisheries, and are also taken as bycatch of shrimp trawlers and coastal fisheries targeting teleost fish. Fishing pressure directed at juveniles also appears to have increased in parts of the Gulf of California and in Costa Rica and is likely to be increasing elsewhere as other, more valuable fishery stocks are depleted. Patchy distribution resulting from aggregating behavior of adults and the use of historic nurseries, where neonates shoal with spatially confined movements, make this species particularly easy to target. As in other areas, the large fins of this species are highly prized for their value in the international shark fin trade. Increased fishing pressure from international longline fleets in the Eastern Central Pacific and Southeast Pacific, driven by increasing demand for fins, is of concern. Furthermore, as traditional and coastal fisheries in Central America are depleted, domestic fleets have increased pressure at adult aggregating sites such as Cocos Island (Costa Rica) and the Galapagos Islands (Ecuador), or along the slopes of the continental shelf where high catch rates of juveniles can be obtained (Vargas and Arauz 2001).

In the Gulf of California, *Sphyrna lewini* is a common catch in the directed artisanal elasmobranch fisheries of Sonora, Sinaloa, Baja California, and Baja California Sur, Mexico. Juveniles, including neonates, dominate the overall landings of this species; most are less than 100cm total length (Bizzarro et al. in press). Bottom set gillnets and longlines produce the majority of the catch. Adults are landed in artisanal pelagic longline and gillnet fisheries, but represented less than 20% of the total *S. lewini* observed in artisanal catches

during 1998 and 1999 fisheries surveys (Bizzarro et al. In Press). The indirect take by trawlers and artisanal teleost and shrimp fishermen is unknown. Landings data for 1996-1998 from the Gulf of Tehuantepec, Mexico, indicates that Scalloped Hammerheads were the second most important shark caught in the artisanal shark fishery, representing 36% of the total catch from a sample of 8,659 individuals (Soriano-Velassquez et al. 2002). The size of the individuals in this sample is unknown. Marquez (2000) reports that this species represented only 4.61% of the total catch of the artisanal fishery in the Gulf of California, contrasting with reports for Sinaloa, Mexico in 1994, 1995 and 1996, in which scalloped hammerheads represented 80.3%, 52.54% and 85.68% of the shark catch respectively (Marquez 2000). Off Pacific Guatemala, the importance of this species in the fishery landings appears to vary across areas, from 6% (n=339) to 74% (n=800) of the total catch from 1996-1999 (Ruiz and Ixquiac 2000). Data from El Salvador collected from July of 1991 to June of 1992, indicate this species represented 11.9% of the landed catch in a sample of 412 (Villatoro and Rivera 1994).

The number of adult individuals at a well-known *S. lewini* aggregation site in the Gulf of California (Espíritu Santo seamount) has declined sharply since 1980. In 1981 Klimley and Nelson estimated the size of a school at 525 individuals using Lincon Index mark recapture methods. Between 1998 and 2004 at least 20 attempts have been made to recreate this study, however in most cases fewer than 8 individuals have been observed at one time (Klimley 1999, Klimley and Jorgensen unpublished data).

Large hammerheads were formerly abundant in coastal waters off Central America, but were reportedly depleted in the 1970s (Cooke 1990). Industrial longlining initiated in the early 1980s, and again large hammerheads provided valuable fins for this market. A comparison of standardized catch rates of pelagic sharks (species-specific information was not available) in the EEZ of Costa Rica from 1991-2000 showed a decrease of 60% (Arauz et al. 2004). In 1991, sharks formed 27% of the total catch. In 2000, only 7.64% of the total catch was sharks, and in 2003 this decreased further to 4.9% of the total catch, 58.2% (Arauz et al. 2004). In 2001 and 2003, scalloped hammerheads only constituted 0.14% and .09% of the total catch by individuals, respectively.

In Ecuador, catch records (grouped for the entire family Sphyrnidae) indicate a peak of approximately 1,000 tons in 1996, followed by a steady reduction until 2001 (Herrera et al. 2003). Landings in the port of Manta (accounting for 80% of shark landing in Ecuador) of *S. lewini*, caught by artisanal longline and drift net fleet were about 160t in 2004, 96t in 2005 and 82t (2006). Artisanal fishery landings into the port of Manta for *Sphyrna*

spp declined by 51% between 2004 and 2006 (Martínez-Ortiz et al. 2007). According to Carrera-Fernández and Martínez-Ortiz (2007) the percentage of juveniles in landings is 83% for females and 71% for males. Most of the landings for this species (74%) take place between January and June.

Divers and dive guides in the Galapagos have noted a severe decrease in shark numbers and schools of hammerhead sharks (P. Zarate pers. comm.). Illegal fishing around the Galapagos is not only practiced by fishermen from the Galapagos, but also by the industrial and artisanal fleet from continental Ecuador and international fleets (Coello 2005). These illegal fisheries target sharks for their fins. There are no species specific data for these fisheries, but *S. lewini* is one of the most common species around the Galapagos (J. Martinez pers. obs.), and given the high value of fins of this species, it is very likely that it is targeted in illegal finning activities. In an effort to help stopping the illegal finning occurring in the Galapagos, the Ecuadorian Government issued Decree 2130 in 2004 prohibiting fin export from Ecuador. Unfortunately, the Decree had the reverse effect of establishing illegal trade routes, with fins being exported mainly via Peru and Colombia where there is no finning ban in place. Interviews with fishermen and traders in both Ecuador and Peru suggested that illegal trade routes operated for fins transported both from Ecuador and directly from Galapagos to Peru (Saenz 2005, WildAid 2005). Ecuador then abolished Decree 2130 and issued two new Decrees (482 and 902) in 2007 which establish better controls; traceability of the exported products; re-confirm the prohibition of finning established in 1993; a database on trade and establish as State policy the National Action Plan for the Conservation and Management of Ecuadorian Sharks (PAT - Ec).

AUSTRALIA

There has been a large increase in illegal, unregulated and unreported (IUU) fishing in northern Australia in the last few years (J. Stevens pers. obs.). Several initiatives are underway to identify which species are being taken and in what quantities. Hammerheads are known to feature in the catches, and are suspected targets for their large valuable fins, although no specific data are available. Some domestic boats are also suspected to be targeting species for their fins in the Northern Territory, and this likely includes hammerheads. There is an urgent need to obtain data to form an accurate assessment of the population in this region.

Conservation Actions: Scalloped hammerhead is a member of the family Sphyrnidae, which is listed on Annex I, Highly Migratory Species, of the UN Convention on the Law of the Sea. States are urged to cooperate over the management of these species. No such management yet exists. Precautionary

adaptive collaborative management of target and bycatch fisheries is urgently needed for this highly migratory species. It is also essential to improve and sustain data collection and develop stock assessments for this species. Listing on international resource management agreements, such as the Convention on Migratory Species (CMS) could help to drive improvements in national and regional management and facilitate collaboration between states, for this species and other migratory sharks.

The adoption of shark finning bans by fishing states (e.g., USA, Australia), regional entities (EU) and regional fisheries organisations (e.g., ICCAT, IOTC, IATTC, WCPFC) is accelerating and should increasingly prevent the capture of oceanic sharks for their fins alone.

Management plans, fishing regulation, and monitoring programs are needed throughout this species range.

NORTHWEST ATLANTIC AND WESTERN CENTRAL ATLANTIC (INCLUDING CARIBBEAN SEA)

In the US this species is included in the Large Coastal Shark complex management unit, on US Highly Migratory Species Fishery Management Plan (National Marine Fisheries Service: Federal Fisheries Management Plan for Atlantic Tuna, Swordfish and Sharks). There are, however, no management measures specific to this species, and no stock assessments. Efforts to limit catches of this species, and increased monitoring of incidental catches in commercial fisheries are both recommended.

SOUTHWEST ATLANTIC

In Brazil, there are laws restricting the length of pelagic gillnets and banning trawl fishing at a distance of less than three nautical miles from shore (equivalent depths of less than about 10m), however enforcement of these laws has been difficult. Therefore trawling in inshore nursery grounds has continued and gillnetting within nursery areas is not regulated. Some fisheries along the coast are poorly documented and the multi-species nature of many of the fisheries makes species-specific regulation very difficult. Therefore, it is recommended that coastal protected sea areas are established, in which fishing is banned, to protect nursery grounds.

In 1998, the Brazilian Government's Environmental Agency (IBAMA – Brazilian Institute for the Environment and Natural Renewable Resources) made a first effort to control "finning" by issuing a federal regulation (Portaria IBAMA nro 121 of August 24th, 1998), prohibiting shark finning by all vessels licensed to fish in Brazilian waters (Kotas et al. 2002). The enforcement of this law has been proven difficult and probably will require international financial aid, trained personnel for sampling work along the main fishing harbours and the establishment of a national observer program (Kotas et al. 2002).

EASTERN CENTRAL AND SOUTHEAST PACIFIC

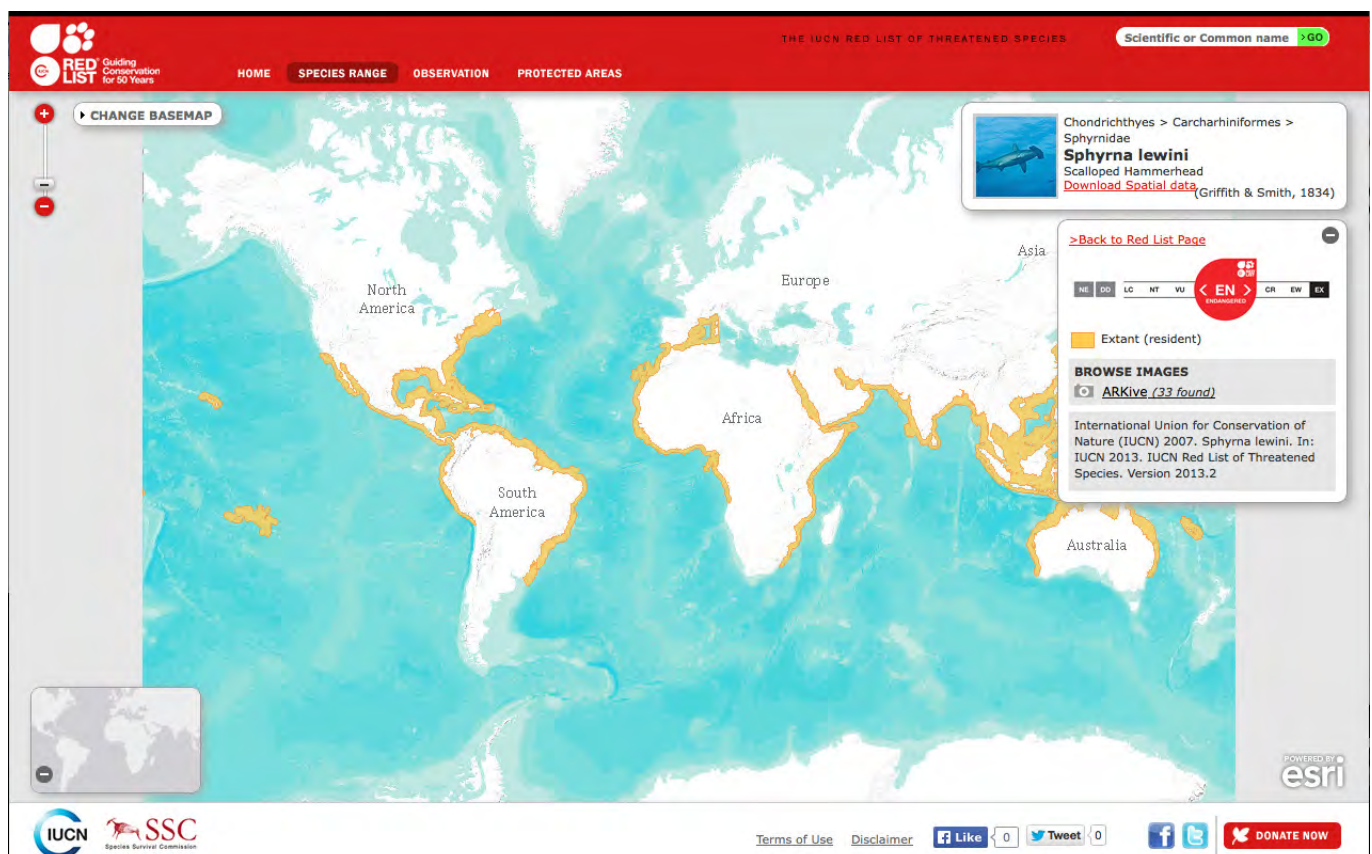
There are no species-specific measures in place for *S. lewini* in the Eastern Pacific, although steps are being taken towards the management of elasmobranch fisheries.

In Ecuador the current regulations prohibit shark fishing in the core zone of the Galápagos marine reserve, however extensive poaching has been reported. Ecuador issued two new Decrees (482 and 902) in 2007 which establish better controls; traceability of the exported products; re-confirm the prohibition of finning established in 1993; a database on trade and establish as State policy the National Action Plan for the Conservation and Management of Ecuadorian Sharks (PAT - Ec). In Mexico, some known adult aggregating sites are protected within the Revillagigedo Island archipelago, however enforcement is lacking and there are many reports of poaching. Protection of known nursery adult aggregating sites is recommended. Estimates of acceptable catch rates should be viewed with precaution until there is more certainty in age and growth parameters.

AUSTRALIA

Although Australian fisheries are generally well-managed, the recent increase in illegal, unreported and unregulated (IUU) fishing vessels in the waters of northern Australia is of concern for this species.

Citation: Baum, J., Clarke, S., Domingo, A., Ducrocq, M., Lamónaca, A.F., Gaibor, N., Graham, R., Jorgensen, S., Kotas, J.E., Medina, E., Martinez-Ortiz, J., Monzini Taccone di Sitizano, J., Morales, M.R., Navarro, S.S., Pérez-Jiménez, J.C., Ruiz, C., Smith, W., Valenti, S.V. & Vooren, C.M. 2007. *Sphyrna lewini*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. www.iucnredlist.org



DIVING & ADVENTURE TOURISM IN MALAYSIA

FEATURE **FEI CHIN KAW**



Malaysian Diving Ambassador, Mr. Clement Lee.



EDA's Executive Director, Mr. Ibrahim Al Zu'bi, and Director of Tourism Malaysia Dubai, Mr. Mohd Taib Ibrahim.

Following the success of 2013 Tourism Malaysia 'Divers' Appreciation Night' event, BFC Management recently conducted a series of "Diving & Adventure Tourism in Malaysia" events on behalf of Tourism Malaysia showcasing the vast variety of opportunities there are on offer for travellers to Malaysia. The events coincided with DMEX in Dubai on 6 Mar 2014 and then a follow up in Doha on 10 Mar 2014.

At the event in Dubai, we had the honour of having a few members of the Board of Directors from EDA attend and Executive Director, Mr. Ibrahim Al Zu'bi, the Consul General of Malaysia to the UAE, Dato Ahmad Fadil Shamsuddin, the Director of Tourism Malaysia Dubai, Mr. Mohd Taib Ibrahim and renowned Malaysian Diving Ambassador, Mr. Clement Lee.

Historically, EDA awarded its very first lifetime membership to Mr. Clement Lee at the event. Mr. Clement Lee was thrilled and said that it

was an honour to be recognised in the Middle East by EDA, an organisation that he is very proud of and often speaks about all around the world. Mr. Clement Lee received his DEMA Reaching Out Award in 2008 in Las Vegas and was inducted into the International Scuba Diving Hall of Fame on 2011 in the Cayman Island. He was the first Asian to receive the DEMA Reaching out Award and hence the first Malaysian to have had this honour. Clement also said, "Environment, particularly the oceans are our 'silent' partner; they don't speak, but they will react. When they are not well, we are all going to be sick!"

EDA and Tourism Malaysia also exchanged tokens of appreciation for the support rendered to each other over the past decade.

These events highlighted the fact that Malaysia is truly the ideal destination for those seeking an unconventional travel experience, be it a short romantic getaway or an off-the-beaten-track adventure. Of course, the country's stable

political and excellent economic conditions make it an irresistible venue for Incentive and Special Interest organisers as well, as they know there will always be something to suit all participants, no matter where they are from.

Malaysia is also the ideal place for Corporate CSR activities and student programmes, for instance CAS, combining adrenaline, physical activities, cultural elements and service aspects.

Of course diving is the mainstay of the Malaysian tourism activities and with hundreds of tropical islands; you'll find an incredible choice of dive sites and undiscovered beaches. It's not surprising that Malaysia is regarded as one of the world's top dive destinations. You can pick from a variety of underwater landscapes – including sloping reefs, pinnacles and coral gardens – for deep, drift, wreck, cave and wall dives. Get ready to meet an amazing array of brilliant, exotic marine life beneath these pristine waters – some of which are rarely experienced anywhere else on earth.



Mr. Clement Lee spoke about the beauty of diving in Malaysia. Apart from the well known Sipadan island, about 40 minutes away is the Tun Sekaran Marine Park consisting of several heavenly islands and standing out is the Bohey Dulang island – the island which he described as Heaven On Top and Paradise Underwater. "Here if you are a super macro photographer, you will love it as underneath is a real paradise for nudibranchs, flamboyant cuttle fish, frog fish, leaf fish and also the 'orangutan crab'. You will not be short of subject. You will see occasional manta rays passing by and of course turtles etc too. Please do not forget to hop on to the other island, 'Si Amil' where you will be thrilled by schools of hundreds of resident devil rays, it's a must see of all the unique underwater life."

Ms. Fei Chin Kaw, director of BFC Travel Management later said that away from the diving, Malaysia is home to the tallest mountain in South East Asia, Mt. Kinabalu. Kinabalu has many excellent trails to hike and there are dozens of other hiking trails (e.g the Pinnacles at Mulu National Park, Mt. Tahan in Pahang, Cameron Highlands trail, etc.). These trails offer climbing challenges to suit all levels of abilities, ranging from the strenuous exertion of a 9-day traverse of Gunung Tahan to a relatively gentle trek through the botanical gardens of Mount Kinabalu.

Verified by Guinness World Records as the highest via ferrata in the world, those up for a challenge can try descending Mt. Kinabalu via ferrata. One of the greatest thrills a hiker can have is to walk or climb a via ferrata, the 'iron path.' Travelling on a via ferrata is a different way of enjoying the sheer magnificence of Kinabalu, providing access to places normally reserved for rock climbers and mountaineers. In this awesome mountain environment, you will be stopped in your tracks by amazing views, from a perspective that few have the opportunity to experience.

I'm sure some of you will be asking what is a via ferrata?

A via ferrata, iron path in English, is quite literally a route with fixed 'protection' that aids travellers in moving safely through mountains. Protection found on a via ferrata includes a combination of hardware affixed directly to the climbing or walking surface, most often the rock wall. Elements include:

- Cables made from heavy-gauge steel wire, the most common element of a via ferrata,
- Metal bars or posts, drilled and cemented into the rock, with eyelets on the end for the cable to run through (like "rebar" used to reinforce concrete buildings),
- Rungs of metal, creating a virtual ladder,
- Stemples, or steps created from wood and secured to the mountainside,
- Ladders and bridges.

Each component provides both a way to

aid travel and an element of safety, providing hand holds, assisting with balance and actually enabling you to attach yourself to the rock. Go on give it a try!

Perhaps if you don't fancy climbing up you could try climbing down instead! Malaysia's many limestone outcrops provide the right ingredients for the formation of hundreds of interesting caves. Many have been made accessible, offering impressive sights and adventurous caving with crawling, climbing and swimming through passages.

If all this physical exertion is too much for you, how about watching the ultimate spectator sport? With Petronas as its flagship, Malaysia is home to one of the important races of the Formula One circuit. Arrange your visit during the race week to experience the adrenaline of the racetrack as well as the natural tracks of the country.

A slightly gentler, and quieter, option is cycling. With its scenic beauty and well-developed road network, Malaysia has no shortage of road cycling events every year so you can either go follow an event or even take part.

Away from the mechanical tourism there is a massive variety of wildlife available to build a trip around. The tropical environment and the extensive rainforests have led to a huge diversity of plant and animal species. Surveys have identified more than 8,000 species of plants including 2,000 tree species, 800 types of orchid and 200 types of palm. Living amongst all of this lush vegetation are more than 200 species of mammals, 600 different bird varieties, 140 species of snakes, 80 types of lizard, 300 species of fresh water fish and thousands of insects who make their homes in the rainforest.

A river cruise is one of the best ways to spot these 'local residents' – an adventure you'll never forget! Conservation in the Kinabatangan floodplain also fulfills Malaysia's pledge as a signatory to the Ramsar Convention to promote the wise use of wetlands.

Keeping to the water theme, Malaysia is blessed with many fine rivers, providing many venues for white water rafting. Experiences range from the high adrenaline Class 5 rapids to the more tranquil family rides. Some rivers are very remote, as they travel through the Orang Asli (aborigines) settlements and ancient forests full of bird and animal life, and some flow past limestone caves and prehistoric archaeological sites. White water rafting can be experienced on day trips, or as part of a longer group trek.

If like me you love to get a few rounds of golf in wherever you travel, there are numerous courses to choose from in Malaysia. Whether one chooses to tee-off in the cool highlands, amidst lush greenery or by the fringe of the

South China Sea, one can do so on superbly designed, international standard golf courses. In addition, with each course depicting a style or theme highlighting its natural surroundings, one can indulge in challenging rounds enhanced by Malaysia's natural beauty.

Other options you can try are backpacking as a single traveller, celebrating your honeymoon on top of the tallest mountain in South East Asia (this has to be one of the most romantic things you can do!), searching for Proboscis monkeys and learning about bird watching with your family.

What else? Malaysia actively encourages sustainable travel, so try staying at an eco lodge as part of your agenda, look to learn the etiquette of the national parks, wildlife reserves, protected lakes, caves, UNESCO Heritage sites, etc. during your trips. There are also opportunities to visit schools, orphanages or old people's homes either as part of an organized CSR activity or as an individual wanting to give something back to society.

Last but not least why not experience a culinary tour and sample the very varied Malaysian food as part of your adventure.

Adventure means different things to different people, it can be unusual experiences or it can be something bold, involving some risk taking with uncertain outcomes and generally stepping out of your comfort zone and unleashing your curiosity.

Subconsciously, many people live in a familiar environment bubble – a phenomenon where they surround themselves in a similar living environment when travelling abroad. There is nothing wrong with it, but it is just so much more fun when you step out of your comfort zone and have an adventure. So why not try something new on your next trip (after you've done the diving of course!).

How many activities you can do really depends on how long you have, so I recommend 2-3 activities per trip so you can savour the experience and not be too exhausted. Malaysia has year long tropical weather so whatever time you go, you will always find something adventurous to do.

Malaysia is a very affordable destination and based on your budget, we can customise your itinerary. However, we do have several fixed group trips available, please feel free to get in touch to find out more. You can reach BFC Travel Management at info@bfctravels.com or +971 (0)4 360 7177.



TRAVEL MANAGEMENT



AN UPDATE FROM THE FIELD

FEATURE **ADA NATOLI**

The dolphins of Dubai. Sighted off the Palm Jumeirah, this group of Indo-Pacific bottlenose dolphins had over 25 individuals with many calves and juveniles.

Our research survey is in full swing as we completed the first three months and entered the second trimester of the year: February and March have been very quiet months for dolphins. Despite our extensive monitoring of the Dubai coastline, we did not record any sightings, nor did we receive many from the public. The weather hasn't always been on our side, however we managed to cover our survey area five times for a total of 62 hours of navigation. We did though, record a good number of sea snake and turtle sightings, in particular in the Jebel Ali area. April had been more active as we had sightings of bottlenose dolphins and surprisingly, of finless porpoises again.

Bottlenose dolphins were sighted off the Palm Jumeirah in two big groups travelling north. There were calves and young juveniles. We did not recognize any of the individuals that we previously photo-identified, however we managed to identify new individuals that have gone to increase our photo-identification catalogue.

Finless porpoises were encountered in shallow waters once again very close to shore, this time in proximity of building work in progress! The group consisted of at least five individuals including one calf. They were extremely shy and difficult to approach. They were definitely feeding in the areas considering their erratic movements and the presence of small fish was visible at the surface. It is extremely interesting to see this species in Dubai waters as so little is known about them. We hope to soon be



This is an Indo-Pacific bottlenose dolphin reported from the Western Region, Abu Dhabi. Its missing dorsal fin is most probably the result of a boat strike, but it makes it highly recognizable. Photo by © S. Al Hameli.

able to provide more information that will help to better understand the distribution and identify the hotspot areas in UAE waters.

Once again, we have to thank everyone that reported their sightings! More and more people now report sightings, some of them quite regularly and this information is so precious for us! Despite the fact that we didn't record any sightings in February and March through public records, we know that both bottlenose and humpback dolphins were in Dubai waters at the beginning of March. Even more interestingly, from a picture received, we were able to follow, for the third time, the movements of one humpback dolphin now known as Flipper, by the person that submitted the image. Flipper has been sighted in November, December and then again in March, always in the same area between Umm Suqeim and Jumeirah Beach Park.

We also received many sightings from Abu Dhabi, including some great pictures of very recognizable individuals. If those of you in the diving community do encounter any dolphins, please make it a priority to report them.

If you encounter a dolphin or a whale, dead or alive, please Report Your Sighting to www.uaedolphinproject.org!

Alternatively, you can text **+971 (0)56 671 7164** or email it to sighting@uaedolphinproject.org with the following info: Date, Time, Location and/if you have a picture. You can also post it to the project Facebook or Twitter pages. Please make an effort to take pictures! You could very well identify a known individual!



Flipper is an Indo-Pacific humpback dolphin that has been re-sighted three times thanks to pictures submitted by the public. It is clearly recognizable by two notches on its dorsal fin.



Finless porpoises sighted off Jumeirah New Island. This species is almost impossible to sight unless with calm seas. There were plenty of small and large fish present in the area including a sea snake.



Photo by Simone Caprodossi



These images show how to differentiate between male and female elasmobranchs. You can tell the difference between the two sexes by the presence or absence of claspers. As shown, females (left) have a cloacal opening while males (right) have two claspers situated between the pelvic fins on the ventral side. The claspers on juvenile elasmobranch species can be very small and easily missed.

YOUR EYES ON ELASMOS

ADVANCING RESEARCH AND CONSERVATION

PROMOTING CITIZEN SCIENCE

USING YOUR EYES TO MAKE A DIFFERENCE

REPORT YOUR SIGHTINGS OF SHARKS, RAYS AND GUITARFISH IN THE ARABIAN REGION

FEATURE AND PHOTOGRAPHY **RIMA W. JABADO** UNDERWATER PHOTOGRAPHY **SIMONE CAPRODOSSI**

WHAT IS THE GULF ELASMO PROJECT?

The Gulf Elasmobranch Project has been running since 2010 and was initiated as part of a PhD research study lead by Rima Jabado. The study focused on investigating the shark fishery along with the trade in shark products (fins and

meat) in the United Arab Emirates (UAE). Results from this three-year project indicated that sharks were being targeted and exploited by fishermen across the country both for local consumption and for the shark fin trade to Asia. The study also clearly showed that the

fishery is currently unsustainable and immediate management measures were needed to ensure the long-term survival of these species.

Because there are currently no comprehensive research projects in the region investigating



Images of the whole body of the animal are very important since partial pictures may not allow for proper differentiation between species similar in appearance. Also, to help estimate the size, it is useful to place an object in the picture for comparison (measuring tape, pencil...) alongside the body of the animal.

elasmobranch species, the Gulf Elasmobranch Project website has been launched to ensure data is still collected about the diversity, abundance and distribution of sharks, rays, guitarfish and sawfish. This information is crucial since without accurate and scientifically based information to support conservation measures, governments will not prioritize elasmobranch protection.

WHAT ARE ELASMOBRANCHS?

The term 'elasmobranchs' specifically refers to all species of sharks and batoids (rays, guitarfish, sawfish and skates). Around the world, there are currently more than 500 species of sharks and almost 650 batoid species that have been described. Elasmos are characterized by 5 to 7 pairs of gill openings on the side of their heads, dermal denticles for scales (placoid) and a spiracle (small respiratory opening behind each eye). Their life-history patterns are very different from most teleost fish. Most species are long-lived with biological characteristics

that consist of slow growth, late maturity and the production of few young.

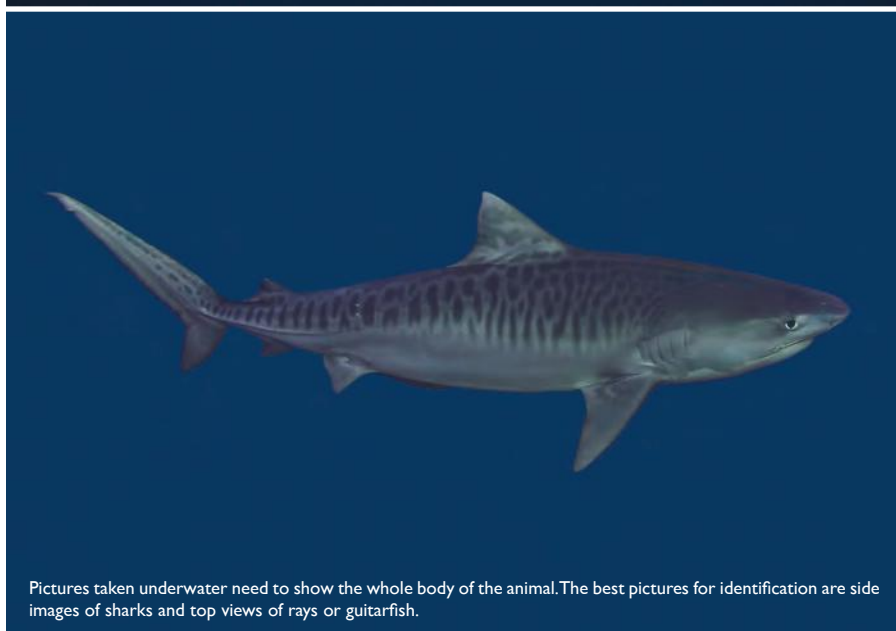
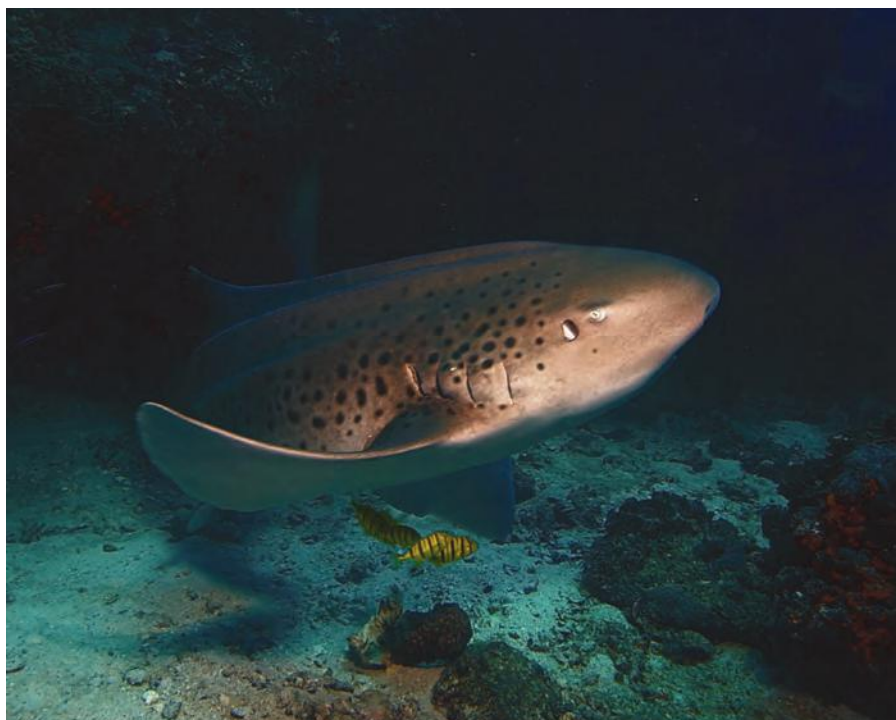
Their life history traits make them extremely vulnerable to anthropogenic threats and once populations are overexploited, they are very slow to recover. It is believed that the current exploitation level of many elasmobranch species is unsustainable and that their depletion will have serious impacts on marine ecosystems.

THE STATUS OF ELASMOBRANCHS AROUND THE WORLD AND REGION

Many studies have shown that sharks and batoids are increasingly facing threats and population declines in various water bodies have been largely documented. It is believed that as many as 73 million sharks could be killed around the world every year. Scientists have shown that many shark populations have seen declines of up to 80-90% in their numbers in recent years. This is mainly due

to the intense fishing pressure many of these species are facing. The demand for fins from Asia has been a driver for their exploitation and elasmobranchs are being affected by both industrial and artisanal fisheries. Furthermore, they are threatened by a wide range of other anthropogenic impacts including habitat degradation and destruction, marine pollution, recreational fisheries and shark control programs. The last review of the elasmobranch assessments by the International Union for Conservation of Nature (IUCN) Red List indicates that one quarter of all shark, ray and chimaera species are threatened with extinction (74 threatened shark species and 107 ray species).

The 'Gulf' which in the context of this project refers to the broader Arabian Seas region including the Arabian Sea, Sea of Oman, Gulf of Oman and the Arabian/Persian Gulf remains understudied with very little research



Pictures taken underwater need to show the whole body of the animal. The best pictures for identification are side images of sharks and top views of rays or guitarfish.

being undertaken on the status of the various elasmobranch stocks. In the past decade alone, with a few projects, range distributions of documented species have been expanded as new data emerged while new species are still being discovered. Yet, biological data as well as information on diversity, abundance and distribution of species remain limited. This lack of information does not allow assessing the status of elasmobranch stocks in the region and limits the development of scientifically based management measures. It is clear that without any information to support conservation efforts, it will be very hard to implement effective actions for the protection of these species. This region of the world is of particular concern because of the large number of countries bordering the Arabian Sea and north-eastern Indian Ocean that are ranked as top shark fishing countries in the world including India (9% of global catches), Pakistan (3.9%), Sri Lanka (2.4%) and Iran (1.7%). Furthermore, the United Arab Emirates and the Republic of Yemen are considered to be amongst the top five exporting countries in the world for dried shark fins to Hong Kong. It is therefore highly likely that we are pushing elasmobranchs to extinction in this region without even knowing which species actually inhabit these waters. Fishermen in the United Arab Emirates have already confirmed that species that were previously common are now either rare or have completely disappeared.

With the limited research being undertaken, citizen science is the only way to keep collecting information about the diversity, abundance and distribution of elasmobranchs here. Sighting reports by individuals can play a crucial role in monitoring shark and batoid populations by helping evaluate species diversity, abundance and habitat range. Individuals can now help support conservation efforts by reporting their encounters with these animals either underwater or at landing sites.

REPORT YOUR SIGHTINGS

You can make a difference and be our eyes in the field. You can submit information on your encounters with sightings of sharks, rays, guitarfish, sawfish and skates in the region to help collect scientific data, raise awareness about Arabian elasmobranchs and support management decisions. The data is then collated and analyzed to gain a better understanding of the species composition of elasmobranchs in this region as well as those most targeted by fisheries. Your reports and sightings can be recent or historical. All information is invaluable and can help!

Please visit www.gulfelasmoproject.com



PROJECT BASELINE DUBAI

FEATURE AND PHOTOGRAPHY **MICHAEL GOUGH** PB DUBAI PROJECT MANAGER



Data collection



DPV. Photo by Jon Lavin.



Team diving. Photo by Joakim Hjeltn.

An exciting new conservation project has just started in Dubai during April 2014. Project Baseline and Dubai Underwater Explorers have established their first underwater monitoring station in the United Arab Emirates.

WHY DO YOU GO DIVING?

Many years ago divers would bring back something from the sea, maybe some brass from a wreck or a lobster or two to eat. Nowadays most divers are far more educated about the marine environment and generally live by the code, "Only take pictures and only leave bubbles".

By its nature, aquatic life is inherently less visible to human eyes and so images, such as photographs and video, play a critical role in visually connecting marine ecosystems to their would-be stewards. Images are capable of conveying information and evoking emotion at a glance and are generally more intuitive, more quickly assimilated, and often more memorable than verbal descriptions. In fact, images and visual media have long played a vital role in effective conservation campaigns.

The fact is the digital age is upon us and it has never been easier to bring back images from your dives. The question is, what will you do with those images?

Project Baseline is a Global Underwater Explorers grassroots, environmental conservation initiative. The project is a global effort designed to record environmental change within the world's aquatic environments. This change is measured over time by collecting scientifically relevant observations within a framework that enables contributions from those most invested in their local environment.

Project Baseline encourages people to take photographs and log dives for personal records and upload them into our database. Observations that are cataloged in an accessible, defensible and consistent manner can be used over time to gain a deeper understanding of each place visited by divers during visits to their regular dive sites.

On a local level, we can all take small actions to protect our marine environment. We will only care about what we understand and only protect what we care about.

The Dubai coastline of the Arabian Gulf has undergone major changes over the past decade. The development of several major construction projects including several man made islands has had an effect on the aquatic environment.

Our goal within Project Baseline Dubai is to map out the current state of underwater conditions and document environmental changes in the area. By doing this, we aim to raise awareness within our local community and pass on our findings to local authorities through the collaboration of EDA.

Dubai Underwater Explorers are a community-based group of divers dedicated to the exploration and conservation of our planet's underwater regions. We are not associated to any specific dive center or dive club although we support several of the local dive operations as customers and we are all EDA members.

It is our hope that by connecting divers in this region we will facilitate social interaction that will help improve the quality of education and research in all things aquatic. We are actively

involved with Project Baseline and some of our members support GUE exploration projects around the globe.

Dubai Underwater Explorers promotes continued diver education and safety within our group through a variety of activities. We can also offer introductory workshops for those not familiar with the GUE system.

Our diving is usually done in teams of three (when numbers permit), rather than in a buddy pair. This provides an additional set of eyes to watch over each diver. It also promotes greater safety and more efficient teamwork during project activities. To ensure that our activities are both safe and enjoyable, we steer clear of egocentrism and peer pressure, favoring instead a team-oriented, cooperative approach to diving. We are an open group and welcome divers from all backgrounds and training agencies.



Our Project Baseline Dubai page is located at www.projectbaseline.org/projects/united-arab-emirates/dubai

The project can be followed on Facebook at **Project Baseline Dubai**

If you would like to get involved in Project Baseline Dubai or would just like some more information about diving with our group, please drop us an email at baselinedubai@gmail.com

IT'S ALL ABOUT TIME!

FEATURE **PATRICK VAN HOESERLANDE**



At the end of my dive during which I have admired the attractive depths of the Spanish coast, I start rising to the surface. A glimpse at my dive computer tells me that I must perform a decompression stop of 6 minutes at 5 meters. At my decompression depth, I check my computer to verify the stops and I start the long wait. My thoughts wander off during the stop. What is '6 minutes'? Or more generally, what is time?

We all know the feeling of, 'not having enough time'. Time is the only thing we can never have enough of. We can have too little or too much money, food, diving equipment...but we all have too little time. But what is time exactly? Is time an observable, measurable phenomenon?

REFERENCE AND DURATION

The past is fixed while we live in the present and look forward to an uncertain future. As humans, we are the only living creatures aware of the time phenomenon, but we experience time only by what it does with tangible things and not in its intangible, naked fourth dimension.

Time was for centuries an incomprehensible mystery. Even scientists like Aristotle and Einstein could not completely unravel the concept of 'time'. This attempt to shed some light on this issue must be read with the necessary sense of relativity.

I would like to propose an approach to our time problem by splitting it into two: the first is the question of the 'reference' and the second is the 'duration of the unit of time'. After all, in order to meet the other, we must know how long we have to wait by starting from a particular moment.

TYPES OF CYCLES

In the beginning, man lived in relative harmony with nature. It is therefore not surprising that the first measurements of time were in relation to the cyclical phenomenon of nature. For example; the moon cycle gave our ancestors an indication of the progression of time. 'We'll meet over 3 full moons,' was an ancient, brute, but accurate determination of time. The problem, however, was to pick the best cycle to use, because nature offers plenty of possibilities.

The rotation of the earth around the sun causes a number of cycles such as day/night or the seasons. These cycles are very inaccurate. For example: how accurate can you, without a calendar at hand, determine the beginning of spring? At what hour would you be at a rally point if you, without a watch, had agreed to meet at sunset? Not only is the reference point a problem, also the duration causes a headache.

The time it takes earth to orbit around the sun from equinox to equinox is not exactly 365 days. It is exactly 365 days, 5 hours, 48 minutes and 45 seconds. A standard year of 365 days would cause a 1 day shift every 4 years. A neglect of this small deviation would, after centuries, result in a shift of the seasons in relation to the yearly calendar year. After some time, summer would start in January.

It is therefore not surprising that in 54 BC, the leap year was introduced in the Julian calendar. However, the method was not exact enough and needed, in 1572, the intervention of Pope Gregory III, because the difference was already 10 days. From then on, thanks to the application of the current rules, the shift of the

seasons is considered negligible. But caution is needed; our method is still not perfect, because every 100 years we have a difference of almost three-quarters of an hour.

Also, our days are not equally long, because the earth rotational speed is not constant. The rotational daily speed of our planet can vary up to 15 milliseconds. The sun is therefore not always at noon on its highest point of the solar arc. There are also differences during the year. The result of the ellipsoidal orbit and the inclination of earth's axis makes it that the sun runs in the month of November more than 15 minutes ahead, while it lacks behind in the summer months. Moreover, due to the variation in velocity, our northern summer lasts longer than in the southern hemisphere. Thus, we, Northerners, can enjoy the beach and the sun longer.

In addition, earth's rotational speed decreases by the influence of the tides caused by the attraction of our moon and sun. In order to correct the increasing length of our days, after some years, a second leap is inserted. Some people say that with getting older the days fly faster. There is a psychological explanation for this feeling which lies in the decreasing relative size of the present day compared to the complete period of the already lived days. But from an astronomical perspective, this feeling is completely wrong!

The many variations in the solar time are explained by the interaction between the earth and the sun. From the day humans looked to the stars, they began to use the more stable star time (even in Star Trek they use star dates). A star (also a sun) is so far

away from earth, we talk of distances in light years, that days and seasons are not influenced by the irregular circulation of earth around the sun. Nevertheless, even this time is subject to the rotational whims of our earth. So star time, except by astronomers, is no longer used.

Some scientists thought that the moon was a better celestial body for measuring time. The earth-moon combination constitutes a stable system. We observe the influence of the moon by the tidal movements. Every 12 hours and 25 minutes, we may observe high and low tides. The complete tidal cycle takes 24u50 and is called a "moon day". The moon rotates around the earth in 29.5 days and spins, not by chance, in that time once around its axis. Therefore, we always see the same side of the moon. The system earth-moon slows down with one 16 millionth of a second per year. A long time ago, earth spun much faster. The moon was also closer to the earth than now, because the centrifugal force of the system pushes the moon away. Although a better system, this results in non-stable time.

THE ORIGIN OF THE SECOND

You can essentially make the partition of a day as large or as small as you want. We have to thank the ancient Egyptians for our current partition of a day because they already used a 24 hour system. The old Babylonians distributed everything in parts of 60: the day had 60 hours; the hour had 60 minutes which had 60 seconds. From them, we inherited our 60-part system of minutes and seconds. The second is an old unit based on earth's rotation. As we have discussed earlier, an earth day is not a constant, and thus the old second was not a constant either. Attempts to capture the second with the aid of a clock failed. The clepsydra or water clock, the hourglass, candles and oil lamps (marked with a number of stripes) and the sundial all had their disadvantages: water may freeze, an hourglass must be constantly watched, candles or oil lamps can be blown out by the wind, and a sundial only works when there is sun. Apart from the sundial, these basic 'clocks' could usually only measure the duration of an event, not the point in time at which the event took place.

Sailors, postal services, train services, traders ...all needed a clear indication of time and moments. In order to fix appointments, a stable second was desperately needed. The invention of the mechanical clock in the last decade of the thirteenth century brought the solution.

The first clocks were large and expensive artwork that had, for reasons of visibility, to be placed in the centre of the town. Belforts and church steeples were particularly suited. Of course later on, those big clocks had to be synchronised with each other. In England there were entrepreneurs who made a living by getting the time in Greenwich and for a fee, went to bring time to their subscribers. They were sellers of time. Another way to synchronise watches was with the sound of

the big clocks. Later, the synchronization was achieved by telegraph lines. The network of synchronised clocks spread slowly. The moment each country had its standard time, it became necessary to introduce a world standard.

The mechanical clock ensured a constancy of time, but there was still a need for a world reference. Because the prime meridian of Greenwich was for centuries the reference for nautical charts – England was the global sea power in that era – it was decided, although not easily, to accept this meridian as the reference. The time associated with the meridian of Greenwich, was baptised the Greenwich Mean Time (GMT).

To stick as close as possible to the local time, time zones were introduced. In 1928, the 'Universal Time' (UT) was introduced. This is a more precisely defined time based on the GMT. The polar motion made that this time was not equal across the globe. To solve this, a corrected time was introduced, the UT1.

With the invention of the atomic clock in 1955, the atomic time was introduced. The second was no longer defined as a fixed part of the unstable day, but as the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium 133 atom, at rest and at a temperature of 0 K. Quite astonishing, in 500 BC Pythagoras already had the suspicion that measuring time had something to do with vibrations. This is not synchronised with the UT and therefore the UTC was introduced. The international acronym UTC is a compromise between the French 'TUC' (Temps Universel Coordonné) and the English 'CUT' (Coordinated Universal Time). UTC is itself not an abbreviation. The UTC is regularly adjusted to stay within a second of difference with UT1. By doing this, UTC and atomic clock times are drifting away.

It is now technically possible to globally synchronize the clocks within a deviation of a small fraction of a second. The Global Positioning System (GPS) works on the basis of runtime measurements with an accuracy of a few tens of nanoseconds. For the internet and other computer networks there is the Network Time Protocol to synchronise the internal clocks of computers.

WHERE DOES OUR NEED FOR PRECISION STOP?

You are likely to find an atomic clock the ultimate measurer of time, but for some scientists, it is still too imprecise. Remember that the speed of light is slightly less than 300,000km/s. In 1/1000th of a second, light still travels 300km. We want to explore the even smaller building blocks of the cosmos. Therefore the Europeans built an underground, circular tunnel of 27km in Cern, near Geneva in Switzerland. In this steel circle, superconducting magnets accelerate atoms up

to almost the speed of light. If those high speed atoms collide they break up in even smaller particles. Filming the moment of impact reveals the existence of particles like muons.

The lifespan of the muons is but two millionth of a second. But they also fly through our atmosphere. Is the explanation for their longer existence in the cosmos that they travel at near light speed? Bombarding atomic nuclei creates other exotic particles that live but a millionth of a billionth of a billionth of a second. Where do we stand with our capacity to measure 1 nanosecond (10-9s) in relation to particles that only last 10-24s? Neutrinos originated from exploding stars and are heading with the speed of light towards our planet and are, despite their limited life expectancy, able to visit us. Einstein explained this by the relativity of 'time'. He claimed, however, that nothing could travel faster than light, but the existence of tachyons could contradict this statement. Did this famous scientist not fully comprehend 'time'?

EPILOGUE

My dive computer beeps and tells me that my time is over. Or does it only begin now?

SPECIAL INTERLUDE

Einstein predicted in 1905 that the clock of a fast traveller is running slower than that of a person who stays at home: the famous twin paradox. Travel at high speed means that you spend less time than someone at home: the contraction of time. This phenomenon is detectable on board of an airliner. This was proven in 1971 by Hafele and Keating by flying four atomic clocks around the world. At the end of the experiment the clocks had a clear, measurable time delay.



YOUTH DIVING – LIFE IN FRESH WATER

FEATURE **KIKI VLEESHOUWERS** AND **PATRICK VAN HOESERLANDE**

Although youth diving becomes more popular by the day and the number of publications on this topic is increasing, there are very few books on diving for young divers. To fill this gap, a group of divers from the Flemish Diving Association (NELOS) published a book focused on the youngsters and their parents. Two young heroes, Skubba and Fred, together discover the world of diving, guiding you through the book covering many topics.

While the stories and the book are in Dutch, we would like to present two extracts because it is interesting stuff and it gives you an idea on how we can inspire young people to take up diving. The two articles show what you can discover underwater in our Western European waters. Remember, the book is for young divers, but we are sure that grown-ups will have fun reading it as well. They might even learn something new.

The chapter on biology was co-written by Kiki Vleeschouwers, a vet with special interest in underwater biology and is very comprehensive. Parts of the articles are shown here and are limited to a few special plants and animals. The book contains information on common encounters in fresh water, such as the pike and the carp, but in this summary we are picking out the "special encounters".

DIVING IN 'REAL' WATER? COOL!

You are not going to be alone in that 'real' water! And we are not talking about your diving buddy. What can you see and explore down there? Let Scrimpy be your guide. Together with our funny shrimp you will discover a bunch of underwater creatures. He will advise you how to find them all yourself.

Marine biologists, smart people who know everything about underwater plants and animals, talk about two types of water: fresh and salt. Take a glass of drinking water. Drink it. That is fresh water. Now take the saltshaker and sprinkle a lot of salt in a glass. Really, a lot of salt. Mix it well and drink it. Yuck! That is salt water. It sounds odd, but far more plants and animals live in salt water than in fresh water. Weird, hey?

If you're out walking, you will probably see a lot of plants (grass, flowers, trees, etc.) and if you take a really good look around you, you may spot an animal (rabbit, bird, squirrel, etc.). On land there are many plants, but not so underwater. Underwater there are many more animals than on land. Some even look like plants, but they are actually animals.

Scrimpy is becoming impatient. He wants you to meet his fresh water friends and match them up with their descriptions.



Amphipod. Photo by Ivo Madder.

RED WATERMITE

What is this? A small red dot of just a few millimeters which rolls and spin here and there in the water. This is the red watermite.

SOMETHING SPECIAL

Get your underwater magnifying glass out, have a look through it and what do you see? That small animal has 8 legs! Yes, because of his many legs it belongs to the family of the arachnids, spiderlike creatures.

FACT

Why such a bright red colour? Well, this small animal tries to look mean and very dangerous to predators that like to eat him. What do you think? Does it work? Are you afraid?

GREAT RAMSHORN

What is this? A small shell, only a few inches large, with a very special round and flattened shape. This is the house of the great ramshorn.

SOMETHING SPECIAL

Snails are simultaneously both boy and girl. They are hermaphrodites.

FACT

Scientists, whom are also very smart people, gave them this name because their house looks like the coiled horns of a ram.

WATERWEED

What is this? A green plant with a long stem and small green leaves. Sometimes free-floating in the water; sometimes with roots in the soil. This is a waterweed.

SOMETHING SPECIAL

Now you really should take your magnifying glass out because waterweeds form a perfect shelter for a lot of small life such as tadpoles, cute amphipods, eggs of salamanders... Make sure you have enough air in your tank so that you have the time to discover all these small animals!



Zebra Mussel. Photo by Ivo Madder.

FACT

You will easily recognize waterweeds. It is a plant that you find in just about every aquarium with a goldfish swimming around.

HARDER TO FIND IN FRESH WATER

So, this was the warm up in which we went looking for common animals, plants and weeds. This was just an appetizer for more to come. Now the more difficult work starts because Scrimpy takes you in search of underwater animals that like to play hide and seek. Sharpen your senses and follow Scrimpy very closely!

AMPHIPOD

What is this? What kind of pale animal with many legs wriggles on the bottom and in water plants? Look very closely because it is only a few centimetres long. If you find it and try to touch it, you will discover that it is a fast swimmer and that it can change direction very quickly. Meet the amphipod.

SOMETHING SPECIAL

The amphipod has many legs. Each of them looks very different and has a certain form



Freshwater Hydrozoa. Photo by Jandel Broek.



Waterweed. Photo by Jandel Broek.

because they all have a specific task. An amphipod has swimming legs, feeding legs, cleaning legs... Its legs are really quite handy. With his feeding legs he catches small bits of food, this may be plant fragments or small creatures like mosquito larva. It bundles it in a small packet and then brings it to his mouth to enjoy.

FACT

At certain moments in the spring, you often see an amphipod with another smaller amphipod between its legs swimming around. And, they don't let go of each other. They really stick together. No, the big one is not eating the smaller amphipod. That is the male that keeps his beloved female between his legs so he doesn't lose her.

ZEBRA MUSSEL

What is this? A nice, little shellfish about 3cm big (or small). It is triangular in shape, with dark stripes on a light-yellow background on its shell. The shells are firmly attached to a hard surface and sometimes there are many of them together. This is the zebra mussel.

SOMETHING SPECIAL:

These animals originally come from the regions of Russia and they like our fresh water very much. That is why you can find them in almost all fresh waters. This is very much approved by the tufted duck, because this duck really loves to eat zebra mussels. They are incredibly tasty! Despite the fact that these mussels are very firmly fixed to the ground or to each other by strings, these are solid byssus threads that they make themselves and the duck can easily pull them loose. You should try it too, it's not easy though! You will see that those strings are really very strong.

FACT

There are male and female zebra mussels. And where are those baby mussels? In mom's

shell? No. Dad and mom zebra mussels just throw their seeds and egg-cells in the water. If those find each other, then a baby mussel is born. These are called larvae. These very small larvae float and grow in the water. When they are big enough, they descend to the bottom, fixing themselves to grow into a mature mussel.

A COLONY OF MOSS ANIMALS

What is this? It seems to be a caterpillar under water! It's a slim yellow-white somewhat fluffy caterpillar of about 3cm long, called a colony of moss animals.

SOMETHING SPECIAL

No, it is not really a caterpillar. Take your magnifying glass and look at the creature again. These are all small creatures, called polyps, who live together in a colony. The fluffy things are small tentacles which the creatures use to catch their food. Tap gently against the tentacles and you see that they withdraw these with lightning speed and you see that the 'caterpillar' loses its fluffy appearance.

FACT

Moss animals are not fond of cold. Once the water temperature drops below 8°C, each polyp creeps back in his own room which is a bit like a survival capsule. These capsules sometimes stick to the legs of a duck and that is how these moss animals travel from one pond to another.

FRESHWATER HYDROZOA

What is this? If you are able to discover moss animals, then you're ready to find an animal that looks a bit similar. It really is smaller, it is less than 1cm. It also lives together with its friends, but not as closely packed together. It looks like a fine stem of a plant, or twig with threads at the end with its feet firmly anchored in a hard surface.

Have you found it? Awesome! You have found the fresh water hydrozoa!

You also have fresh water polyps. These grow on aquatic plants and look like stretched anemones. They are white-transparent and can be up to 10cm long.



Red watermite. Photo by Ivo Mudder.



Freshwater Sponge. Photo by Ivo Mudder.



A Colony of Moss Animals. Photo by Ivo Mudder.



Great Ramshorn. Photo by Claus Ableiter.



Pondweed. Photo by René Van Leeuwen.

SOMETHING SPECIAL

The threads that you see are actually tentacles with genuine sting cells. These are the same cells that sting when you touch a jellyfish. If you touch such a polyp, it retracts its tentacles and reduces itself completely to a small bead. Now you really need your magnifying glass!

FACT

A fresh water hydrozoa is firmly fixed by his feet, but it can move. This is not at high speeds as you can imagine. If you want to observe the animals during a walk, you will need more than one well-filled dive tank to stay long enough under water...

FRESHWATER SPONGE

What is this? A yellowish somewhat jellylike with tabs and holes in it, it seems a bit like a flattened bath sponge. It sticks against a wall, on wood, stone, metal or twigs.

Congratulations! You have just found a very particular animal, a freshwater sponge.

SOMETHING SPECIAL

Really! A sponge is an animal! It is not a plant!

Therefore, your bath sponge was an animal! Although that one came from the sea. It is a very primitive animal. It eats by filtering the water. Each cell of the sponge may grow into a new sponge.

Does a sponge worry if it loses a piece? Not really, the broken piece becomes a new sponge. Life can be very simple for an animal like the sponge.

FACT

In salt water, you'll find many different types of sponges, in a great variety of colours and forms. In fresh water however, there are not that many sponges.

Sometimes, fresh water sponges are green instead of yellow. Make no mistake, it is not another sponge species. The green colours are algae which live in the sponge. Sponges and algae can live together.

PONDWEED

What is this? It seems to be a nice little water plant. A green stem with fine branches as a crown stuck around the little stem. Sometimes

you see a small orange ball at the end of such a branch. Super; you have discovered a pondweed.

SOMETHING SPECIAL

Well, pondweed seems similar to a little shoot, but it is not really a plant. Pondweed has no real roots like a plant. That is why pondweeds have little styled feet to hold on to a hard surface. These feet are part of the stem which are not roots like that of a plant, standing in the sand. It is actually a very, very old plant, which exists since 400 million years ago. Respect!

FACT

The nice thing about pondweeds is that when you see them, you know that you're diving in water of good quality. Pondweed only grows in nice, clear water.

SALT WATER

Was this discovery tour with Scrimpy fun? Nice to hear.

And what about animals and plants found in salt water? You can discover the animals in our next article coming out in the September issue. So you have to wait just a little bit.

THE PERILS OF ENTRAPMENT

FEATURE AND PHOTOGRAPHY **FADHEL HASSAN**



I had decided to plan a diving trip to Khuriya Muriya Islands. Given its close proximity to the United Arab Emirates, it was an easy decision to make especially as the islands boast a resident population of humpback whales, mantas and large groupers. One of the highlights found there is a wreck of a British war ship sunk during the First World War. The wreck is 150 meters long and is in excellent condition. It was going to be a new adventure as this part of the world is still pristine. The diving area is untouched and still not properly discovered. You could therefore expect to see just about everything.

I had very high hopes to encounter humpback whales, especially as the week prior to mine, a group of them had been seen swimming in the same area. As the week passed by, I came to realize that I was not as fortunate to see these giant mammals, but what I did come across was an uncommon experience.

I overheard a heated discussion between a group of divers and a dive master debating a problem they had come across on one of their dives. It had all started around the round table of the liveaboard when the divers reported an abandoned fishing net they had seen on their last dive. Abandoned fishing nets continue to kill plenty of aquatic life that inadvertently swim straight into them. Acting as part of their design, the nets restrict movement, causing starvation, lacerations, infection and finally, suffocation. The divers said there were a few large fish and a manta ray trapped to their death inside. They had been unequipped and could not pinpoint the location of the net otherwise they would go back and attempt to cut them loose.

Later that day, myself and my two buddies, Nico Körner and Monika Egloff were on our night dive together when we came across this huge fishing net with a trapped cownose ray (eagle ray family). Initially I thought it was dead due to its static position, but when Monika got



close to examine it, the ray showed evidence of life. The poor guy was pretty much helpless and had given up trying to free itself and now lay there ensnared inside the net with severe bruises on its wings and bloody red eyes. It was lucky we had just started our dive when we saw the ray. Nico had a dive knife with him and I had my camera allowing us to document and share the rescue.

It was too dark to do anything without a flash light and the ray became frantic as we began cutting it loose, making it a very difficult situation in the attempt to not injure the ray more. Just when we thought we were close to having it freed, we still had the tail to consider which took forever to untie, adding to the fact of how dangerous it was while the ray waved its tail up and down.

It was quite a struggle to release the poor guy but it felt good to save its life. After the successful release, we dived to the bottom of the sea to cut parts of the net that formed the foundation of the 10 meter high vertical wall so that no more aquatic life could get trapped there again.



Having gone through this experience, I was puzzled as to why fishermen would carelessly discard a net depleting the fishing population in such a wasteful manner; but on further research, I later discovered that most fishing gear is not deliberately thrown out, but is lost in storms or during strong currents. The problem with abandoned, lost and discarded fishing gear is made worse with the increase of global fishing operations and the introduction of highly durable fishing gear made with long-lasting synthetic materials.

Solutions to these problems do exist, such as financial incentives that could encourage fishermen to bring old, damaged and retrieved gear back to the ports. Additionally, locations where gear has been lost can be marked with GPS coordinates to facilitate retrieval later on.

DIGITAL ONLINE 2014

EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION

AWARD CEREMONY: WEDNESDAY, 28th MAY 2014 | 19:00-22:00 | AMERICAN UNIVERSITY IN DUBAI

EXHIBITION OPEN TO THE PUBLIC: 29th MAY – 7th JUNE IN AUD'S ROTUNDA GALLERY | 9:00-17:00

DIGITAL ONLINE'S MAIN OBJECTIVES ARE:

- To discover new promising underwater photographers in the UAE.
- 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).

Digital Online is open to UAE Nationals and all people living in the UAE under a valid Residence Visa and of any diving qualification with a valid EDA membership status.

DIGITAL ONLINE SPONSORS

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DIGITAL ONLINE

جمعية الإمارات للغوص
EMIRATES DIVING ASSOCIATION
PHOTOGRAPHY AND FILM COMPETITION

2014 WINNERS AND PRIZES

DSLR 1st PLACE WINNERS

1. JAN WENGER | WIDE ANGLE-INTERNATIONAL – 458PTS
Tourism Malaysia – Destination Package – 5 days/4 nights in Sipadan, Malaysia.

2. DAVID ROBINSON | MACRO-INTERNATIONAL – 450PTS
Philippine Department of Tourism – Dive Package to Anilao, Batangas – 5D/4N Single Accommodation with meals and 3-4 dives/day.

3. SIJMON DE WAAL | PORTRAIT-INTERNATIONAL – 442PTS
Desert Islands Resort & Spa by Anantara and Al Mahara Diving Center – Two night complimentary stay on Sir Bani Yas Island for two at DIRS (including breakfast) with a two tank boat diving excursion with Desert Islands Watersports Center.

4. MOHAMED ABDULLA | PORTRAIT-LOCAL – 436PTS
Kungkungan Bay Resort – Destination Package – 7 nights/6 days in Indonesia. Includes 7 nights in a beach front accommodation, 3 meals a day, 3 day dives a day for 6 diving days.

5. JAN WENGER | MACRO-LOCAL – 421PTS
Sheesa Beach Travel & Tourism – 2N/2D sharing Liveaboard Trip for two people to the Musandam. Includes all meals, fruits, tea, coffee, water and soft drinks, 5 dives, tanks and weights, dive equipment, swimming, snorkeling, kayaking & fishing.

6. IYAD SULEYMAN | WIDE ANGLE-LOCAL – 403PTS
Tourism Malaysia – Destination Package – 5 days/4 nights in Perhentian Island, Malaysia.

COMPACT 1st PLACE WINNERS

7. AWNI HAFEDH | PORTRAIT-INTERNATIONAL – 435PTS
MTM Marine – Mares Regulator Carbon 52.

8. JURAJ ROKA | PORTRAIT-LOCAL – 432PTS
Nomad Ocean Adventures – A Pair of INON Strobes 2000.

9. JURAJ ROKA | WIDE ANGLE-INTERNATIONAL – 427PTS
Divers Down and Dive Rite – The TravelPac recreational BCD for warm water diving. Made in the USA.

10. AWNI HAFEDH | MACRO-INTERNATIONAL – 422PTS
Nomad Ocean Adventures – A Pair of Nauticam Floating Arms.

11. CHRIS COMBES | MACRO-LOCAL – 415PTS
BFC Travel Management – Destination Package – 4 days/3 nights in Aqaba, Jordan.

12. JURAJ ROKA | WIDE ANGLE-LOCAL – 388PTS
BFC Travel Management – Destination Package – 4 days/3 nights in Tioman Island, Malaysia.

VIDEO 1st PLACE WINNER

13. JAN WENGER | LIFE UNDERWATER-INTERNATIONAL – 379PTS
Le Meridien Al Aqah Beach Resort and Spa – A weekend night stay in a Superior Room inclusive of breakfast buffet for 2 persons at Views Restaurant.

DSLR 2nd PLACE WINNERS

14. SIMONE CAPRODOSSI | PORTRAIT-INTERNATIONAL – 430PTS
BFC Travel Management – Destination Package – 4 days/3 nights in Sharm El Sheikh, Egypt.

15. DAVID ROBINSON | WIDE ANGLE-INTERNATIONAL – 424PTS
Al Marsa Musandam – 2 Night Livaboard Trip in the Musandam starting Thursday evening to Saturday evening. Includes all meals, tea, coffee water and soft drinks, 6 dives, tank and weights, diving equipment and diving coupons, swimming, snorkeling, kayaking and fishing.

16. MOHAMED ABDULLA | MACRO-LOCAL – 414PTS
Al Marsa Musandam – 2 Night Livaboard Trip in the Musandam starting Thursday evening to Saturday evening. Includes all meals, tea, coffee water and soft drinks, 6 dives, tank and weights, diving equipment and diving coupons, swimming, snorkeling, kayaking and fishing.

17. STEWART CLARKE | MACRO-INTERNATIONAL – 413PTS
Millennium Hotel Mussanah Oman and The Oman Sail Dive Centre – One Weekend Stay at the Millennium Hotel Mussanah with a two tank Dive Package to Daymaniyat Islands.

18. DAVID ROBINSON | PORTRAIT-LOCAL – 402PTS
Al Boom Diving – One day dive trip for 2 on East Coast with Al Boom Diving.

19. JAN WENGER | WIDE ANGLE-LOCAL – 399PTS
Nomad Ocean Adventures – Weekend Package in Dibba for 2 people (2 days/2 nights).

COMPACT 2nd PLACE WINNERS

20. JURAJ ROKA | PORTRAIT-INTERNATIONAL – 423PTS
The Dive Centre – A Sidemount Course.

21. CHRIS COMBES | PORTRAIT-LOCAL – 420PTS
Nomad Ocean Adventures – Weekend Package in Dibba for 2 people (2 days/2 nights).

22. JURAJ ROKA | MACRO-INTERNATIONAL – 416PTS
MTM Marine – Mares Flexa 5.4.3 Wetsuit.

23. MICHAEL SAUTER | MACRO-LOCAL – 410PTS
Freestyle Divers – Weekend Stay at Royal Beach Hotel, Dibba with Freestyle Divers diving package.

24. MICHAEL SAUTER | WIDE ANGLE-INTERNATIONAL – 384PTS
Pavilion Dive Centre – PDI Dive Propulsion Vehicle Course.

25. AWNI HAFEDH | WIDE ANGLE-LOCAL – 364PTS
Seychelles Tourism Office Middle East – Big Blue Divers | 1 x 10 Dive package including normal distance boat trips, tank and weights.

VIDEO 2nd PLACE WINNER

26. FAZALUDDIN JAYANTH | LIFE UNDERWATER-INTERNATIONAL – 338PTS
Pavilion Dive Centre – PADI Nitrox Course.

DSLR 3rd PLACE WINNERS

27. STEVEN BOARD | PORTRAIT-INTERNATIONAL – 430PTS
Seychelles Tourism Office Middle East – Dive Seychelles | 1 x 6 short distance boat dives including tank and weights.

28. PHILIPPE LECOMTE | MACRO-INTERNATIONAL – 410PTS
Le Meridien Al Aqah Beach Resort and Spa – A summer two night stay in a Superior Room inclusive of breakfast buffet for 2 persons at Views Restaurant.

29. SIMONE CAPRODOSSI | WIDE ANGLE-INTERNATIONAL – 408PTS
Sheesa Beach Travel & Tourism – Speed Boat Day Trip for two people (2 dives). Includes tanks and weights, dive equipment, dive coupons, sandwiches, fruits, water and soft drinks.

30. SIMONE CAPRODOSSI | PORTRAIT-LOCAL – 402PTS
MTM Marine – Mares X-Stream Fins.

31. PHILIPPE LECOMTE | MACRO-LOCAL – 398PTS
Gulf Marine Sports – Bigblue 170 Lumens Aluminum LED Light – FF1x5W w/flash-off LED.

32. DAVID ROBINSON | WIDE ANGLE-LOCAL – 387PTS
Deep Blue Sea – 2 dives with Deep Blue Sea Diving Center in Khorfakkan.

COMPACT 3rd PLACE WINNERS

33. TEGAN RANDALL | PORTRAIT-INTERNATIONAL – 408PTS
Emirates Diving Association – Sea by Mark Laita.

34. TERRY GARSKE | MACRO-INTERNATIONAL – 403PTS
Deep Blue Sea – 2 dives with Deep Blue Sea Diving Center in Khorfakkan.

35. ANTHONY COX | PORTRAIT-LOCAL – 393PTS
Gulf Marine Sports – Bigblue 170 Lumens Aluminum LED Light – FF1x5W w/flash-off LED.

36. JURAJ ROKA | MACRO-LOCAL – 387PTS
Deep Blue Sea – 2 dives with Deep Blue Sea Diving Center in Khorfakkan.

37. LUJAN MOURAD | WIDE ANGLE-INTERNATIONAL – 380PTS
Pavilion Dive Centre – 2 Dubai dives with hotel access to Jumeirah Beach Hotel.

38. SIV HARTVIGSEN | WIDE ANGLE-LOCAL – 362PTS
OutdoorUAE – OutdoorUAE Magazine yearly subscription, an off-road guide book and an Outdoor UAE T-Shirt package.

VIDEO 3rd PLACE WINNER

39. JERRY VAN DE STADT | LIFE UNDERWATER-LOCAL – 323PTS
Deep Blue Sea – 2 dives with Deep Blue Sea Diving Center in Khorfakkan.

OVERALL DIGITAL ONLINE AWARDS

DAVID ROBINSON | DSLR Overall Award
JURAJ ROKA | Compact Camera Overall Award
JAN WENGER | Video Overall Award

MOHAMED ABDULLA | UAE National Photography Award

THE RESULTS ARE IN THE IMAGES, BOTH STILL AND MOTION, REVEALED

PHOTOGRAPHY D32 EVENTS



"We are honored to have the professional support given to us by some of the top underwater photographers in the UAE and in the world as part of the Digital Online panel. With this pillar, we are able to offer our photographers and videographers expert and fair judgement. Each year we get to see how the returning competition participants grow within their technique and this is something to be very proud of. There is much talent in the UAE and we get to discover them together. Within this discovery, there is the development of growth and learning, the one thing we are drawn together to share. It is of relevance to have Digital Online's exhibition in collaboration with The American University in Dubai this year."

Mr. Essa Al Ghurair – EDA Vice Chairman of the Board

"We at AUD are exceedingly pleased to have been chosen as the host space for the 6th EDA Photography And Film Competition. We're pleased to continue to build upon the strong foundation that has been created between AUD & EDA and find this to be a great avenue to foster that relationship. We also look forward to the wealth of enrichment this will provide the students of AUD."

Brad Moody – Associate Professor of Digital Media, Department of Visual Communication

DUBAI, 28 MAY 2014: Emirates Diving Association (EDA) are unveiling their 6th Digital

Online – EDA's Underwater Photography and Film Competition's Awards and Exhibition Opening which is this year being hosted by the American University in Dubai (AUD) in the School of Architecture, Art and Design Building (A), Rotunda Gallery.

Digital Online was realized 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 sixth 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 2014; BFC Travel Management, Tourism

Malaysia, Kungkungan Bay Resort, Desert Islands Resort & Spa by Anantara and Al Mahara Diving Center, Al Boom Diving, Al Marsa Musandam, Nomad Ocean Adventures, Gulf Marine Sports, OutdoorUAE, Millennium Hotel Mussanah Oman and The Oman Sail Dive Centre, Pavilion Dive Centre, Le Meridien Al Aqah Beach Resort and Spa, MTM Marine, Seychelles Tourism Office Middle East, Freestyle Divers, The Dive Centre, Sheesa Beach Travel & Tourism, Divers Down and Dive Rite, Philippine Department of Tourism and Deep Blue Sea who make these competitions possible.

We would like to thank our printing sponsor, Print Works who provide the quality prints for the Digital Online exhibitions and a big thank you to The American University in Dubai for hosting the Awards and Exhibition this year. We would also like to thank Warren Baverstock, Jonathan Ali Khan, Ali Bin Thalith and Nuno Sá 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.

The exhibition will be open to the public at the American University in Dubai in the School of Architecture, Art and Design Building (A), Rotunda Gallery from the 29th of May through to the 7th of June. The gallery will be open from 9:00-17:00 on week days and 14:00-17:00 on Fridays. Visitors will be asked to show their ID at the main gate to get an entry pass.



L-R: Ibrahim Al Zu'bi, Reema Al Abbas, Ally Landes, Essa Al Ghurair, Khalfan Al Muhairi, Jamal Buhannad

Juraj Roka with Stuart Martin from Divers Down



Awni Hafedh with Christophe Chellapermal from Nomad Ocean Adventures



Simone Caprodossi with Gualav Narkar from MTM Marine



Simone Caprodossi with Fei Chin Kaw from BFC Travel Management



Chris Combes with Christophe Chellapermal from Nomad Ocean Adventures



Mohamed Abdulla



Steven Board



Jerry Van De Stadt



Jan Wenger



Anthony Cox



Michael Lauter with Tyler McDonald from Pavilion Dive Centre



Lujan Mourid with Tyler McDonald from Pavilion Dive Centre



Tegan Randall



Fazaluddin Jayanth with Tyler McDonald from Pavilion Dive Centre



Siv Hartvigsen



Stewart Clarke with Thomas Tapken, VP Operations Millennium Hotels & Resorts Middle East & Africa



Ilyad Suleyman



Terry Garske





Juraj Roka with Jason Sockett from The Dive Centre



Awni Hafedh with Guarav Narkar from MTM Marine



Philippe Lecomte



Jan Wenger



Chris Combes with Fei Chin Kow from BFC Travel Management



Mohamed Abdulla

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© Awni Hafedh – 435pts



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© Juraj Roka – 432pts

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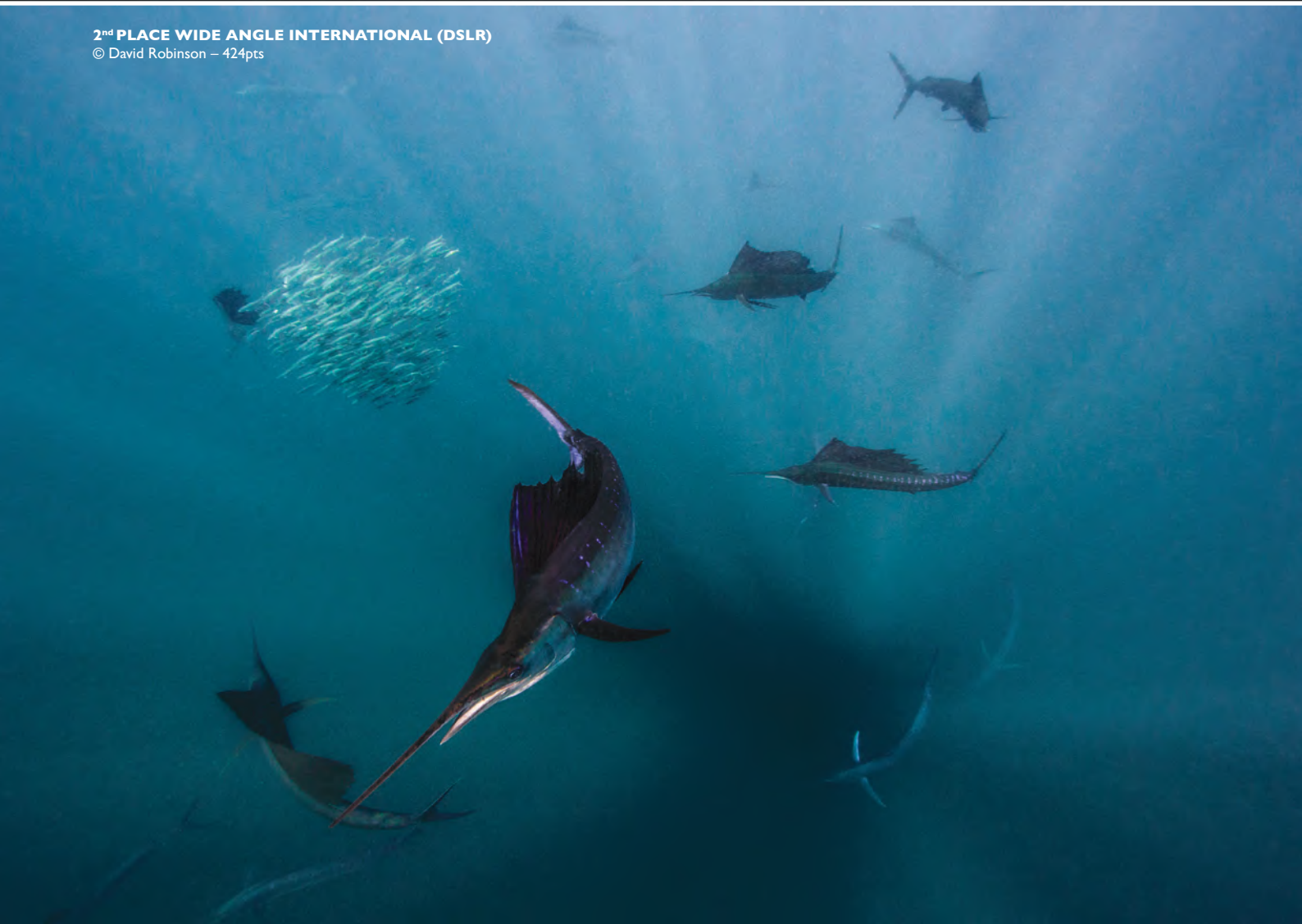
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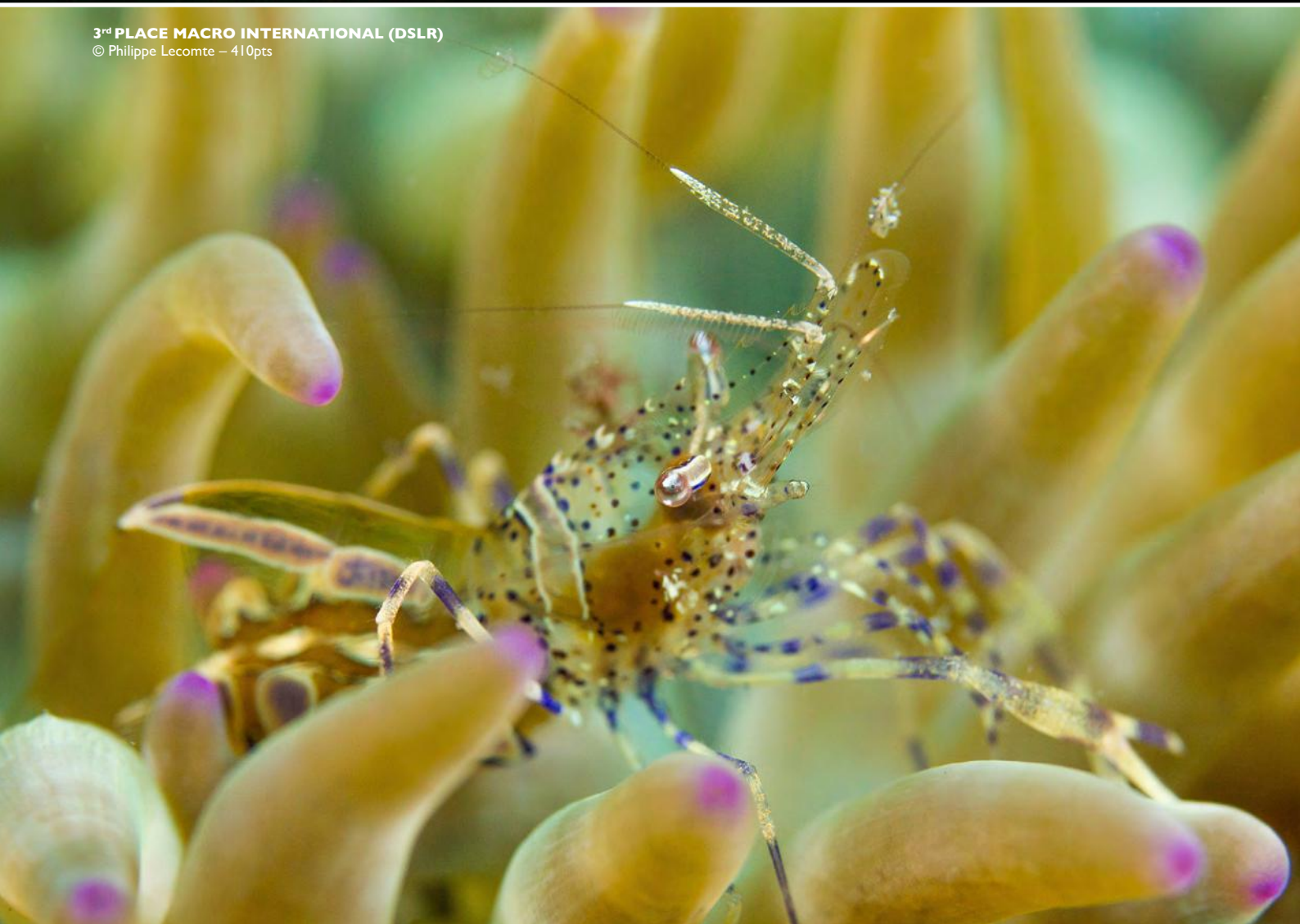


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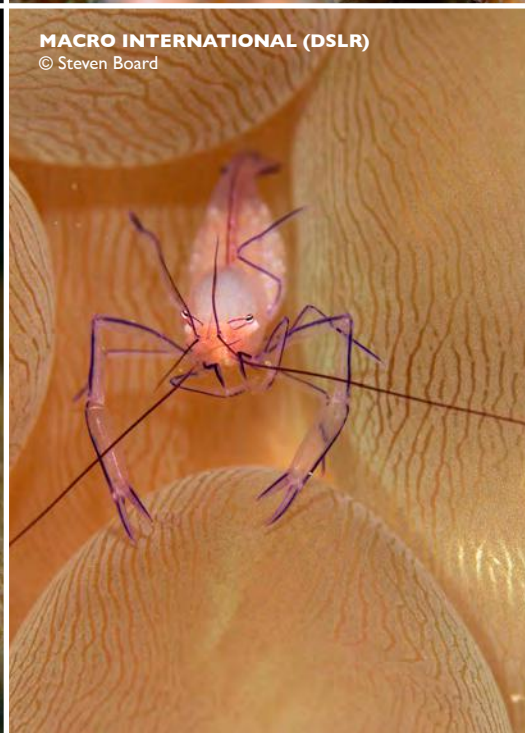
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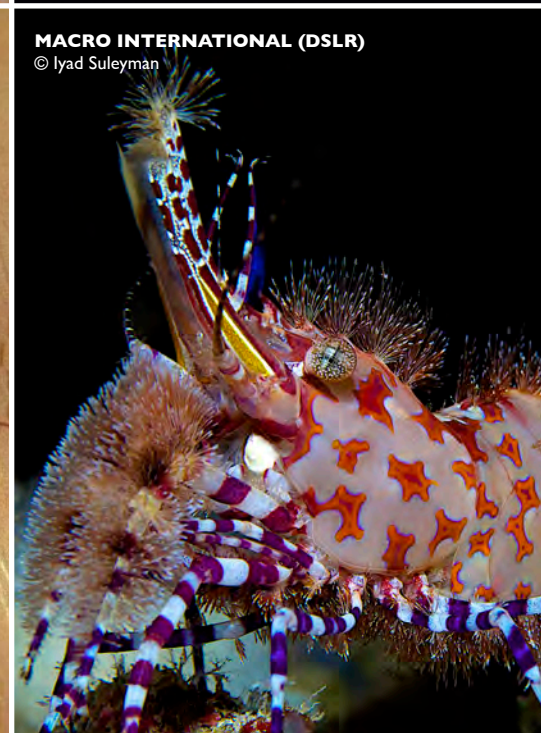
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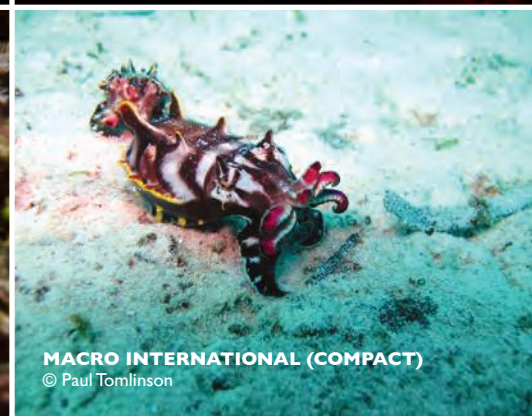
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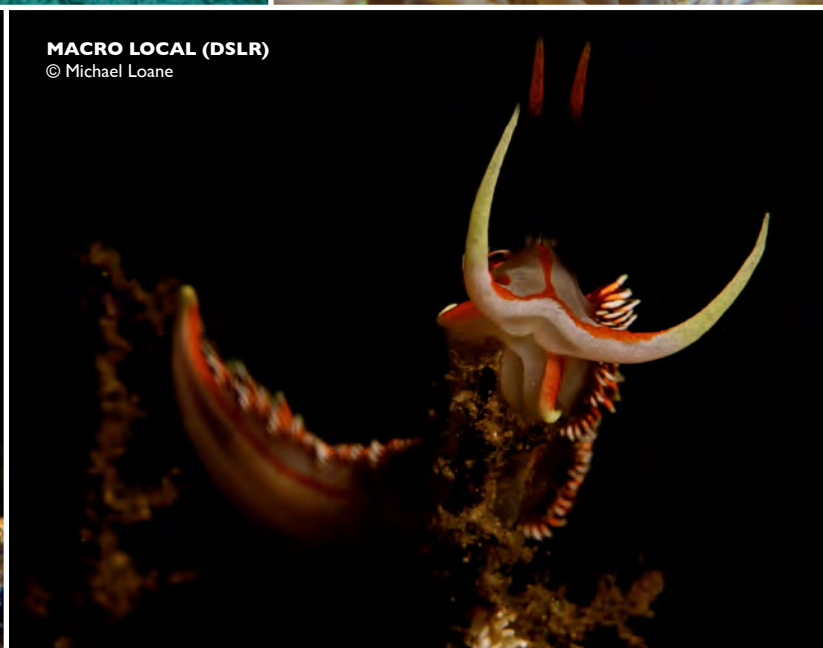
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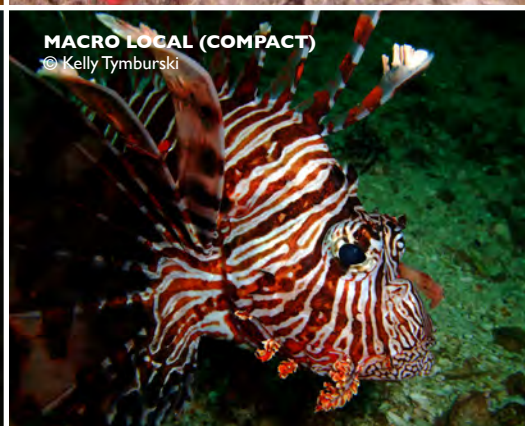
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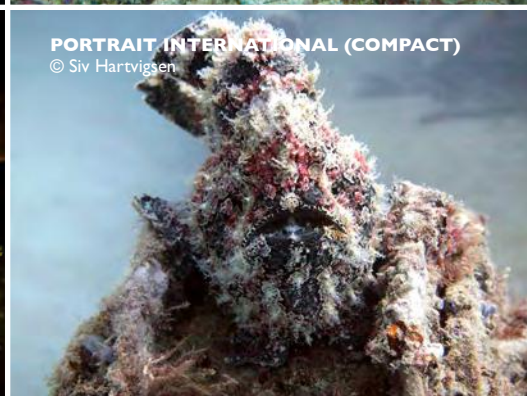
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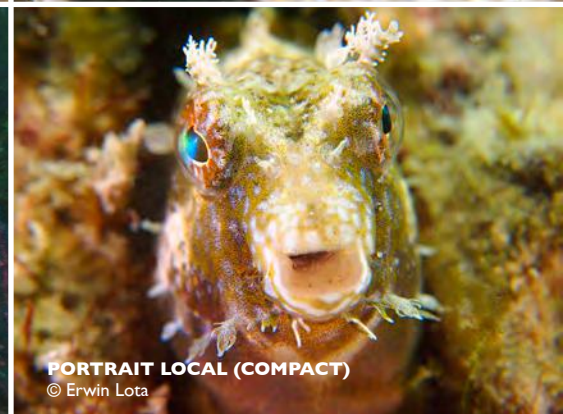
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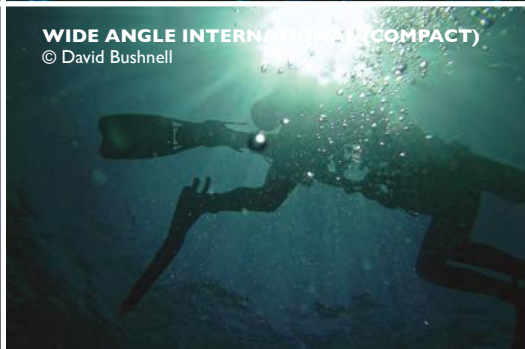
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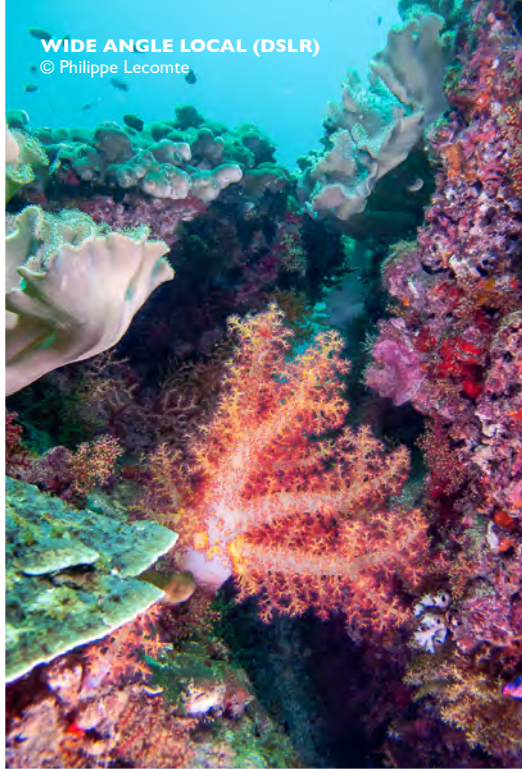


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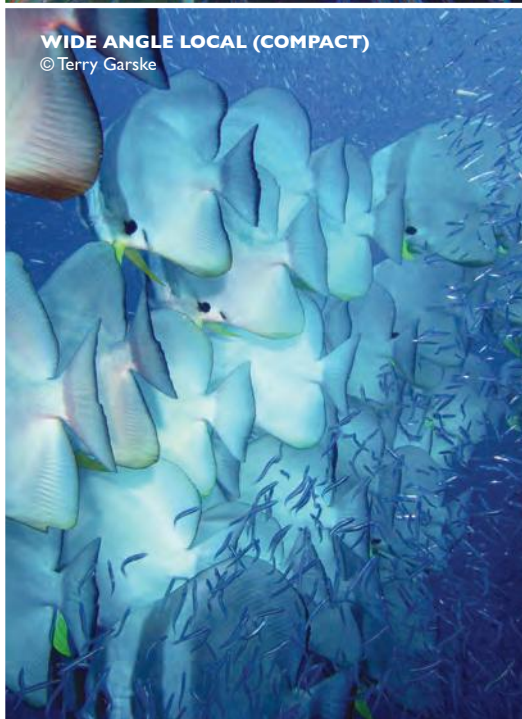
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مسابقة جمعية الإمارات للغوص للتصوير السينمائي والفوتوغرافي تحت الماء

DIGITAL ONLINE 2014 AWARDS

EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION | WWW.EMIRATESDIVING.COM

PHOTO BY ©SIMONE CAPRODROSSI - WWW.SCAPRODROSSIPHOTO.COM
1st Place Wide-Angle (PFC) Digital Online 2013



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

CONTEST OPENED FOR SUBMISSIONS:
Wednesday, 1st January 2014

CONTEST SUBMISSION DEADLINE:
Wednesday, 30th April 2014 @ Midnight

AWARDS NIGHT:
28th May 2014 | 19:00-22:00 | American University in Dubai

DIGITAL ONLINE EDA JUDGES

REEMA ABBAS | EMIRATES DIVING ASSOCIATION
Projects Manager



she's with like-minded people working together for a positive cause.

Reema is a UAE national who has an insatiable passion for life. She paints, practices yoga and travels extensively in search of adventure. An enthusiastic diver; she quotes, 'Diving gives you a feeling of exhilaration as well as tranquility'. Her work with EDA as Projects Manager gives her a sense of fulfillment, knowing that

ALLY LANDES | EMIRATES DIVING ASSOCIATION
Events Coordinator; Graphic Designer; Photographer and Videographer



Ally has been working with EDA since December 2004 where she created and introduced the quarterly magazine, 'Divers for the Environment' and is the magazine Editor. She branded and helped foresee the development of Digital Online – The UAE's Only 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 new improvements, developing EDA's brand, designs and managing all the EDA media material and FAM trips. As a qualified PADI Instructor, she utilizes the experience within everyday life at EDA.

DIGITAL ONLINE GUEST JUDGES

Ali Khalifa Bin Thalith, Warren Baverstock, Jonathan Ali Khan and Nuno Sá will be judging Digital Online 2014 entries in addition to Ally and Reema. We're honoured to have such amazing people and photographers/videographers be a part of this event.

ALI KHALIFA BIN THALITH | DOCUMENTARY FILM PHOTOGRAPHER

Secretary General of 'Hamdan Bin Mohammed Bin Rashid Al Maktoum International Photography Award' (HIPA)



Born in Dubai, Ali Khalifa Bin Thalith Al Humairi is a professional documentary film photographer and he is the Secretary General of 'Hamdan Bin Mohammed Bin Rashid Al Maktoum International Photography Award' (HIPA). He holds diplomas in Documentary Photography (London Academy); and French and Literature (Montpellier University, South of France).

His career journey began in 1995, since which he has participated internationally in numerous exhibitions and specialized courses. He has collaborated in the coverage of many major events globally in: Heidelberg – Germany; Phuket – Thailand; Sipadan – Malaysia; Barcelona – Spain; as well as in the UAE.

In 2010, he won the 'Mohammad Bin Rashid Award for Young Business Leaders' for the best marketing and promotional project. Bin Thalith's rich portfolio of documentaries and films includes: 'Journey to the Green Mountain'; Four episodes of the 'Masirah Island', Oman; 'Alyasat and Alhalaniyat Island', Oman; and 'Sipadan', Malaysia (known for its ecological diversity). Utilizing his extraordinary talents he produced a unique short documentary film titled "Gaza Diver", which narrates the journey and hopes of a poor young man who travels to Dubai for medical treatment – at the behest of a noble gesture by Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum, the Crown Prince.

WARREN BAVERSTOCK | UNDERWATER PHOTOGRAPHER

Aquarium Curator – The Burj Al Arab



Warren has been involved with a number of filming projects within the region such as the popular television documentary "Arabia's Cycle of Life" and the more recent and ongoing "Sharkquest Arabia". Having a passion for elasmobranch conservation, Warren has gained essential

filming experience by joining researchers in Saudi Arabia, Qatar, Djibouti and the Maldives where his filming has included large aggregations of whale sharks and manta rays. With vast experience of working with marine animals within a commercial aquarium environment, Warren specialises in aquaria photography/videography as well as the building and filming of artificial environments for documentaries.

Warren was Digital Online's overall professional winner for 2011 and 2012 as well as 1st and 2nd place winner in British Underwater Image Festival's 2011 competition and was featured in Time magazine, 2011 for his amazing photography on manta rays of the Maldives.

WEBSITE: www.warrenbaverstock.com

FACEBOOK: Underwater Photography by Warren Baverstock

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 cameraman, 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

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



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



THE TIGER SHARKS OF THE BAHAMAS

FEATURE AND PHOTOGRAPHY **PHILIPPE LECOMTE**

The beauty of this place astonishes everyone with its clear blue water and the fact that there is no other land around in sight for miles. Below the boat, the sharks swim in full swing.







For those of you who read the EDA quarterly magazine, some of you may have come across some of my articles which most of the time, focus on sharks. In fact, since several years now, I've been passionate about sharks. Being a photographer, this subject is great to shoot; they are fast, agile and mysterious, making them more attractive to my camera. This new venture to the Bahamas was a dream destination.

In September of last year, one of my work colleagues spoke of an old friend of his who works on HD videos focusing on the likes of whales, sharks and mantas. Patrick Masse is a professional film maker and on making contact with him, he was quick to respond to my email and talk me through his new passion. This is how my story begins.

After checking my dates of availability, I made the decision to go with Patrick to Bimini Island. This is one of the best places on earth to

dive with one of the ocean's most amazing predators, the great hammerhead shark (*Sphyrna mokarran*). The great hammerhead shark is the largest amongst the 9 species discovered. It is a very shy and solitary shark. French Polynesia, Australia and the Bahamas are some of the places known for the chance to see them. Bimini is the best place to approach this species in great conditions of shallow, clear blue water.

The Bahamas is composed of a chain of islands located about 80 miles (130km) east of Miami, Florida. Bimini is the closest point in the Bahamas from the United States and approximately 137 miles (209km) northwest of Nassau. This is an 8 day trip with 5 full days close to Bimini island, on the west side. I arrived on the morning of the 11th of March and met the group at the hotel just 2km away from the airport where the dive operator from Scuba-Adventure was to collect us in the afternoon for our first dive.

Jim Abernethy, a diver with 25 years experience in shark diving, welcomed us at the dive centre while our dive bags were taken and placed in the boat.

The M/V Shear Water, is a 20 metre long boat that accommodates 10 guests and 4 crew members. The large saloon is equipped with plug outlets and tables for you to charge your camera equipment and rest between the dives. We had our dinner onboard before leaving the marina at 10pm to make tracks on the 10 hour journey ahead to reach our destination point.

DAY 1 – 2 DIVES + ONE REEF DIVE

In the morning, we were all set to see the island. The 10 hour cruise over had been a little choppy due to the wind, but in the end, the night's journey was now just a memory.

Our Captain, George Hugues ordered the anchor release and 5 minutes later, fresh bait



was thrown overboard. For several years now, Bimini has been visited by many photographers and videographers wanting to see the great hammerheads, especially during the best times of the season from January until April/May.

A shark lab has been based on the island for more than 20 years. They study the behavior of all the sharks around the island and they recently tagged a great hammerhead in order to understand why they come so close to the land and to find out where they move to afterwards. As a shy shark, even with the bait, the noise or over feeding can cancel the chance of seeing them.

During our dive briefing, our divemaster explained the procedures to follow during the next 5 days in order to avoid any accidents. We were told that bull sharks are already under the boat. Bull sharks are potentially dangerous predators and those with big cameras are told to push them away if they come in contact,

whereas the other divers are given a plastic stick in order to do the same. We were then ready for our first shark dive encounter:

After one hour, the first group resurfaced. The water temperature was 26°C with 20m visibility. After a last equipment check, we jumped into the water as the second group. Slowly descending along the anchor line, we reached the bottom at 10 to 12 metres.

5 to 6 bull sharks (*Carcharhinus leucas*) swam all around us with such agile and graceful movements, paying very little attention to us. When you look them directly in the eyes, it looks as though they are talking to you. They slowly swim just above the sand and sometimes their pectoral fins cut the sand like a knife. It's so amazing to dive with these wonderful sharks. They are strong and can reach 3.5 metres in lengths. These sharks are capable of living in both salt water and fresh water.

Sharks used to be so mysterious to us, dangerous and even considered man eaters. How wrong we were. They are part of a healthy ecosystem. Sharks are a sign of a healthy reef. They are the top of the food chain and not at all what most people say or think; dangerous!

Getting back onto the boat after our first dive, Jim told us that when the bull sharks are here first, there are few chances to see the great hammerheads. We'll see anyway. We will continue to bait and continue to try for the next 2 days.

After 2 dives with several nurse sharks and bull sharks, Jim gives us the opportunity to dive a little further away on a nice reef, seeing as we still haven't seen any hammerheads. There are many types of sponges on the reef, in all shapes and colours surrounded by angelfish, groupers, lion fish and butterfly fish. A little nurse shark sleeps between 2 rocks and a juvenile grey



reef shark sometimes swims around to inspect us. A big stingray covered by sand keeps an eye out and suddenly swims off in a cloud of dust as a diver comes in too close. Several little rays are seen throughout and we can now see why the great hammerheads would come so close to Bimini during a few months of the year. It's a rich feeding ground for them.

DAY 2

We moved the boat from the bay back to the previous day's spot. Weather permitting, we have decided to stay on for the night to have another chance at seeing great hammerheads by keeping the area baited. We had 20 bull sharks and 6-7 tawny nurse sharks (*Nebrius ferrugineus*) hanging around our legs with their partnered remoras.

DAY 3

With another unsuccessful day of encountering great hammerheads, we decided to move our next 2 days on to Tiger Beach. This famous dive site is 80 miles further north. It's a great spot to see a lot of marine activity and is home to tiger sharks, making them a guarantee to see. The decision was approved by the captain, so the move north was made in the night.

DAY 4

The reef is huge with sand patches, cliffs and is an absolute paradise for divers. The nearest island is 35 miles away. The depth of this area is around 12 metres and the visibility is good all year round.

Jim has been coming here for the past 15 years.

In the beginning he only did reef dives, but he then saw that tiger sharks inhabited this little heaven. He began diving the site once a week when time allowed and learnt to know the place and all its sharks by heart! His greatest love there is Emma, a female tiger shark of 4 metres that has lived around the site for several years now. She sometimes leaves the reef but no one knows of her other destination. Maybe to deliver or to get pregnant?

The beauty of this place astonishes everyone with its clear blue water and the fact that there is no other land around in sight for miles. Below the boat, the sharks swim in full swing. Caribbean reef sharks (*Carcharhinus perezi*), lemon sharks and tiger sharks (*Galeocerdo cuvier*) are here.



After our breakfast, we are ready for the days dives. The second group get prepared and after jumping into the water, we descend along the line attached at the back of the boat.

It's surprising to see the level of activity waiting for us. There are about thirty or more sharks swimming around us. Lemon sharks (*Negaprion acutidens*), Caribbean reef sharks, nurse sharks and tiger sharks are everywhere. In the middle of the first day, we had 5 tiger sharks with us. Emma though, is not with them! Stephany, another female of 3.5 metres is and she is the divemaster's favorite tiger. She is huge and not at all shy. We realize how very different the experience is compared to diving with bull sharks. When Stephany approached us the first time, it was

very impressive. She then came in directly to one of the other divers and made contact with his camera. One push, and she moved a little to the side and then came back. Second push was made and she moved again and came back. A third push was made! She's definitely curious, but not aggressive.

With big square noses and a distinct vertical pattern of dark bands on their sides, tiger sharks are feeding opportunists. In some sharks, scientists have found plastic, pieces of tyres, birds, fish, crabs and other sharks. Sea turtles are a favourite. In fact, their jaws can break the turtle shells. Tigers and great whites are the only sharks able to do so. These sharks can be seen in both shallow and deep waters.

DAY 5

During our last day, we start paying less attention to the 20 or 30 lemon and Caribbean sharks around us and enjoy the rest of the colourful marine life. A lemon shark covered in remoras with its mouth wide open has a cleaning wrasse swimming gently inside its scary mouth full of sharp teeth. I come close enough to take some shots before the lemon gets annoyed with this little fish. It was a short but good experience to share this little event.

Unfortunately, the day has come to an end and we are all sad to have to come out of the last dive. This place is amazing and there is no doubt that I will one day come back.

A big thank you to Patrick Masse.





SCUBA DIVING IN ABU DHABI “HOMETURF”

FEATURE AND PHOTOGRAPHY **PAUL WARWICK**

We see so many articles in the EDA Magazine about scuba diving on the East Coast in Fujairah, Dibba and Khor Fakkan and of course the Musandam, with the huge selection of dive sites and the plethora of marine life to see such as whale sharks, different varieties of rays, huge shoals of reef fish and amazing

corals and anemones. I often think that the West Coast is the forgotten “poor relation” of diving in the UAE. Not only that, with so many exotic and exciting scuba diving destinations to visit which are only a short flight from the UAE such as Seychelles, Maldives, Sri Lanka, Thailand, Malaysia and of course the Number

One Dive Destination Egypt and in particular the Red Sea, why dive in Abu Dhabi unless you have to?

There is much discussion and views about the quality of diving in Abu Dhabi depending on your diving preferences, experience and

DIVING DESTINATIONS

aspirations and expectations. Abu Dhabi sits well within the Arabian Gulf and therefore has limited depth – the maximum anywhere being about 55 metres. Being so shallow and with a sandy bottom (no, not draining your glass) making up the majority of the composition of the sea floor, it is subject varying visibility mainly due to the prevailing winds “stirring up” the sand. Construction and development of the littoral has also added to the problems of visibility all along the coast. That said, being the eternal optimist there is always an upside; it certainly improves your navigation skills and your buddy drills. Many “diving students” whose first “taste” of diving is in Abu Dhabi comment on the fantastic array of underwater habitats and surprisingly the variety of marine life there is to see...in the sea...you see?

Abu Dhabi does have some limitations though, but they are only limited by your level of training and the imagination and local knowledge of your Instructor or Dive Leader. If you like deep, 20 metres plus, on a regular basis then the East Coast of the UAE or Oman is probably a better destination. We do have some dive sites which are about a 1½ hours boat ride away at which you can dive to 27 metres at high tide! For the “Wreck Spec Junkies”, we have a fine array of excellent local wrecks (more details to follow) all sitting in around about 22 – 27 metres so you can get your “fix” and lots of “bottom time” if diving on NITROX (within your No Decompression Limit (NDL) for recreational divers of course). However, most of our local diving is no more than 12 metres, so lots of bottom time to explore.

SO WHAT DOES ABU DHABI HAVE?

Well it has diverse and well populated dive sites mainly centred on and around the man made breakwaters and artificial reefs which have been established but there are also natural reefs to see as well. Controls on fishing and access to some sites has meant that they have rapidly developed some excellent varieties of coral and become “home” to some species of fish and a “nursery” to others. It has also shown the robustness of nature in the way that almost all varieties of marine life can adapt very quickly to changing chemistry, conditions and environment.

Abu Dhabi is also an excellent “training ground” for all levels of diver, from the student diver to aspiring PADI Pro and seasoned Instructors providing relatively benign conditions to make training effective and enjoyable whilst having the benefit of longer dive times due to the shallower depths. In short it is a great preparation ground for your future diving adventures elsewhere in the UAE, the region or farther afield.

DIVE SITES

All our dive sites are easily accessible and for ease of reference, are divided into Zone One and Zone Two. Zone One is a maximum of a

30-45 min boat ride and Zone Two anything over that, up to 1½ hours to some of the far sites depending on the prevailing weather and sea conditions.

ZONE ONE

There are some fantastic dive sites in this zone, to name but a few.

THE BREAKWATER: A man made wall which has blossomed over the past few years having been left largely to its own devices and one of my favourite dive sites. It is only a 10 minute boat ride from the Emirates Palace Marina and so flexible you can carry out almost any type of dive in only 9 metres of water so dive times can be outstanding and you will never ever get bored. It is also great for Night Dives – really difficult to get lost! What can you expect to see, well anything from bamboo sharks, turtles, resident dolphins, torpedo rays and leopard rays to a small shoal of friendly resident batfish, huge (and I mean that big!!!) hamour and lots of other reef fish such as arabian angel fish and banner fish. At Night, we are blessed with cuttlefish, prawns, crabs, slipper lobsters and other crustaceans as well as numerous types of rays and sleeping fish.

THE BLOCKS: Another one of my favourite dive sites, the Blocks are a man made reef on the Western side of Sadiyaat Island – not big, the dive site is probably only 100 metres by 40 metres in total, but the blocks are hollow and so have provided a “juvenile playground” for all types of fish who have made their home, including barracuda, sea bream, trevally, jacks and many others. George, the not so friendly orange spotted grouper, has also made it his home and “personal larder”! The sea floor around the Blocks covered in burrows containing gobi’s and their symbiotic cleaner shrimp who continually bulldoze the sand and gravel out of the burrow whilst their erstwhile buddies keep an eye out for predators. If you take time to lie on the sea floor you will see them in action. We are also beginning to see the establishment of marine macro life with a few varieties of nudibranch.

SADIYAAT REEF: Sadiyaat Reef is a natural reef lying not far from the Blocks and so makes an excellent second dive site as it is on the way back to Abu Dhabi. Covered in hard coloured corals into which nestle all kinds of fish and small crustaceans and if you also find a UWTEC Galileo Luna I am sure the owner will be more than willing to pay a finder’s fee – we searched on several trips having marked the site with the GPS and have still not seen it! We have also seen banded sea snakes, turtles and quite a few bamboo sharks. This is a fairly open dive site and can be subject to strong currents, but “pop” up a DSMB and off you go – dive boat in hot pursuit!

AL DABIYAH: Al Dabiyah is one of our natural reef complexes about a 40 minute boat ride from Abu Dhabi. Roughly laid out

in a “horseshoe” shape interspersed with sandy bottom, small islands of coral and some substrate from sections of the reef which have died. That said, the rest of the reef is extremely healthy and thriving providing home to a vast variety of fish. Competent compass navigation supported by natural navigation skills are the “order of the day” if you are to accurately complete a dive circuit with any degree of success on this site. Lying in open water, again this site can be subject to some strong currents.

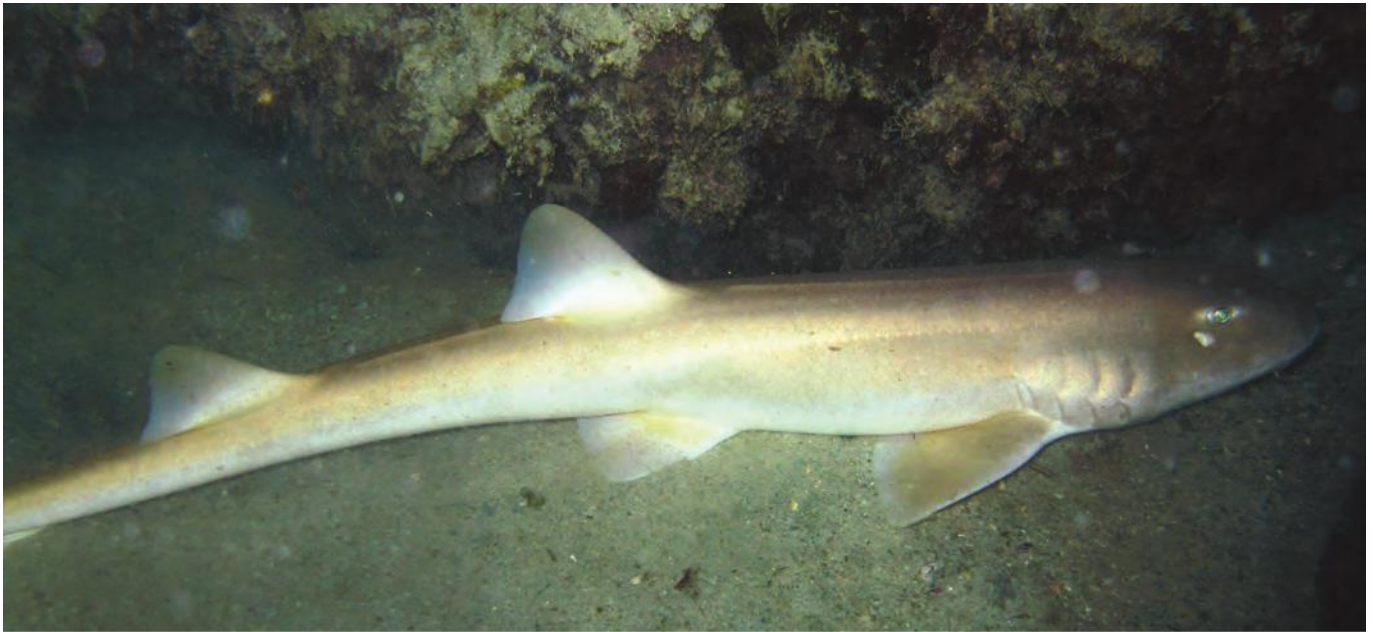
THE OLD CEMENT BARGE: (or OCB as it is affectionately known to local divers who dive with the local dive centres) which is literally just off-shore and although it is quite broken up, there is still enough of the wreck to provide a great Adventure Dive or an introduction to the Wreck Diving Specialty. Lying in about 10 metres, it is teaming with a variety of juvenile fish which in turn attracts larger more transitory predators, such as barracuda and the friendly pod of humpback dolphins which have taken up residence in the channel leading to the Emirates Palace Marina.

ZONE TWO

Well this is really for the Wreck Aficionado’s. We have a “trio” of great wrecks; the MV Jassim, MV Ludwig and MV Hannan, most of which are in good condition and provide great diving at a depth of 22-27 metres. Visibility can vary greatly depending on the prevailing weather and we have seen anything from 1-2 metres up to 20 metres. Currents can be strong depending upon your dive time in relation to the tides tables, but stick close to the wrecks and use the anchor line to descend and ascend and be conservative with your air management and you will be just fine.

MV JASSIM: The Jassim was an old coastal tanker of about 1200 gross tonnes which was used for surface target practice by the UAE Navy and was sunk in 1986. Resting on her port side, the Jassim lies in a maximum of 26-27 metres of water and is broken into three large sections. The stem section consists of the engine room and accommodation, with the large single propeller and rudder still in place. The middle cargo section is a tangled, confused collection of broken hatches, rigging and old vehicle parts and lorry wheels. The bow section is more or less intact with lamp rooms and deck winches. The site always presents an interesting dive although care must be taken in amongst the wreckage. Experienced and suitably qualified divers can access the wreck through the bridge via a number of hatches and explore the engine room and accommodation cabins. There’s also an intact propeller in the stern here as well as an abundance of marine life such as hawksbill turtles, barracuda, snappers, puffer fish and rays.

MV HANNAN: As far as can be determined, the Hannan was an Oil Platform Support Vessel which sank whilst on duty in 1986, for what reason is not known. Experienced divers



can access the bridge and accommodation areas of the small coastal vessel, which rests on its port side. A good spot for treasure hunters, divers have stumbled across objects of value belonging to the unfortunate passengers aboard when the boat went down. The wreck is also known for its resident stingrays and eagle rays, in addition to other species of transitory fish. A large shoal of barracuda seem to have taken up residence, as well as a significant number of extremely large batfish.

MV LUDWIG: More or less intact, the Ludwig was used as target practise by the UAE Navy and now lies in about 25 metres of water on her port side although her bridge was “ripped apart” by a direct hit, blowing out the walls and the roof. Divers can explore the bridge section, the crew quarters and the engine room. Resident marine life is in abundance and includes, hawksbill turtles, barracuda, batfish, sea bream as well as macro life such as shrimp, nudibranch and small fire worms.

You can find out about the dive sites on any of the Dive Centre's websites but these do not adequately describe just how these sites have “flowered” over recent years. The best way is to come and dive them yourself and see. Pick a day when the visibility is 20 metres!

SIR BANI YAS ISLAND

For those wishing to look further afield, remember the Emirate of Abu Dhabi is the largest in the UAE and stretches to Saudi

Arabia in the west. For a change, try Sir Bani Yas Island (affectionately known as SBY) which is about 2½-3 hours drive west from the city of Abu Dhabi towards Ruwais. The Island is owned by the Royal Family and until fairly recently, was a private nature reserve. The reserve is still active, with the “not so dangerous” wildlife allowed to roam free all over the island. Vehicles are severely restricted and you will have to leave your vehicle on the mainland at the main ferry terminal and catch one of the ferries across to the island.

The island only boasts one resort at the moment (Anantara) but two more are planned and building consent has been approved. There is only one and will only be one Water Sports Centre (Desert Island Water Sports Centre (DIWSC) which also offers diving services around the entire island. Being at the centre of Abu Dhabi's marine oil production, there are some 39 alleged wrecks around the island lying in varying depths, but none deeper than 20 metres. The dive centre is fairly new and information on the wrecks is relatively sparse, so they are slowly being rediscovered. So why not visit this oasis on the edge of the desert? Check it out on: www.divemahara.com/desert-islands-watersports-centre.html

HOW DOES IT COMPARE?

So can Abu Dhabi match up to the other dive sites and those further afield? The answer is an unequivocal YES, without doubt, but the

diving is different and not like attempting to compare, “apples with oranges”. There are a few natural habitats around Abu Dhabi in the form of reefs and those appear so fragile yet display a robustness and ability to evolve in surviving the changing chemistry of the water. But the marine landscape has been largely shaped by the development of the region, the breakwaters and the industrial and military wrecks. That said, the Emirate is a strong supporter of conservation and marine protection and we are seeing the establishment of artificial reefs, re-planting of the mangroves and protection of marine species unique to Abu Dhabi such as the Dugong.

I have had some of my most relaxing and interesting dives in Abu Dhabi, as well as some of the longest. There is much to see provided you are prepared to dive with an open mind and not try to directly compare with other more exotic locations. Marine life is just as abundant but sometimes just not as apparent, you have to look and know where to look. Like most dives, what you see is up to what nature has around at that time and to quote Forrest Gump's diving brother, “Diving is like a box of Liquorice All Sorts, you never know what you are going to see until it “pops up”

So come and join the “Dive Tribe” in Abu Dhabi and let us show you what there is to see.

“Keeping the Fun in Diving – Always!”

A DHOW-CRUISE: YOUR GATEWAY TO THE MUSANDAM DIVE SITES

A CRUISE IS THE BEST WAY TO REACH AND EXPLORE THE BEST DIVE SITES OF THE PENINSULA

FEATURE **NICOLA DE CORATO** – ADMIN OF DUBAIBLOG, DIVER AND HELI RESCUE SWIMMER

PHOTOGRAPHY **MASSIMO ZIINO**



Located near the Strait of Hormuz, the Musandam Peninsula offers some of the most spectacular diving in the region, with fine coral reefs accommodating many species and numbers of tropical fish and whale sharks are spotted fairly frequently in the months of spring. The Musandam Peninsula is an exclave of Oman, separated from the rest of the country by the United Arab Emirates, with a stunning backdrop inspired by the historical heritage of fishermen's villages, white sandy beaches and striking mountain scenery. The Musandam's mountainous fjords give it truly unique character. From the sea, you can easily see the geological conformation of the peninsula with horizontal and vertical stratifications seamlessly chasing each other. Fjords, created by fragmented and weathered rock formations stretch out into the sea and massive overshadowing cliffs tower above the beaches. Thousands of years ago, the entire area was below the seas surface. It was suddenly (geologically speaking) forced up when the rocky plates collided to form the Zagros Mountains in Iran and the Musandam cliffs on the other side of the deepened Gulf. This happened long before the volcanic formations of the Hajar Mountains (once a part of Iran), which after serious geothermal events, was separated from the Zagros Mountains.

As the only access to the Persian Gulf, the Strait of Hormuz touches the shores of Musandam, carrying rich nutrient laden waters from the Indian Ocean into the Gulf and contributing to a rich biodiversity and a unique ecosystem

of beautiful wall dives, coral gardens, turtles, rays, dolphins, whales and many other species. Plankton enriched waters attract over 900 species of fish, ranging from tiny cleaner wrasse through to whale sharks. The dive boats are often accompanied by dolphins which like the calm waters of Musandam's fjords.

Visibility ranges up to 30m and water temperatures are between 21-30°C offering excellent year round diving conditions. During the months of November to April, it is almost cold (for the region) and there are sometimes many jellyfish, so it is highly recommended to wear 3mm or 5 mm full wetsuits and hoods, gloves and booties. There is diving here for all levels and memories that will last a lifetime.

A dhow-cruise or a private charter departing from Dibba Port, navigating alongside the dramatic coastline of the Musandam Peninsula, is by far the best solution to reaching the dive sites. In order to discover these places, I chose a shared cruise on a triple deck dhow, together with my friend Massimo who was in charge of taking pictures during the trip as an experienced diver (he has more than 3,000 dives as a commercial diver) and photographer. It was my first cruise and first time to have as many dives in such a short time. I had the chance to enjoy it and dive with Massimo and other experienced divers.

There are over 30 established popular dive sites. As the region is remote and commercial

fishing is not permitted, the biodiversity of marine life is immediately noticeable upon entering the water and leaves a lasting impression on divers. The dive sites themselves range in character from walls to extensive coral gardens. They deliver world class adventurous diving to experienced divers and inexperienced divers alike. Due to the low diving impact in the area, the reefs are healthy and marine life flourishes. Even in the shared cruise, you are able to enjoy and explore dive sites according to your qualifications and experiences.

Here are some of the sites.

LIMA ROCK – Consisting of two sites – one on the north side of the rock and one on the south – this island lies outside from the mainland at 20.5nm, 029 degrees from Dibba port, Oman. It is a wall combination of slopes with lots of nice corals. As the rock is composed of limestone, shallow caves and deep fissures have been carved out by the tides and currents of the surrounding ocean. Table, staghorn, brain and boulder coral can be seen covering the boulders between 12 and 20 metres depth, while below 20 metres, black and purple coral scatter the sandy floor providing shelter for vividly marked yellow mouthed morays.

In the cooler months, at the beginning of the year, whale sharks can be seen frequenting Lima Rock.

Lima rock is also good for bird-watching ospreys, swifts and sooty falcons that reside on the areas of rock above the water, making the site a nice area to rest for a surface interval.

SANNAT CAVE – Not visible from the surface, Sannat Cave is 14.5nm at 026 degrees from Dibba port. The Cave is accessible through tunnels eroded through the limestone rock by the sea. It's a beautiful cave combination of slopes where you might see sting rays, turtles, or schools of fusiliers. The main chamber has a maximum depth of 16 metres; this dive site is best for your 3rd dive of the day, but remember cave diving requires an advanced diver or equivalent and skills to establish neutral buoyancy.

RAS LIMA – Consisting of two sites, Ras Lima is 1.13 kilometers away from Lima village which is 20.2nm at 027 degrees from Dibba port, Oman. There are a number of large rocks across them, some of which form shallow caves. The north site is a wall dive along the interesting and intricate rock face of the headland. It slopes with soft corals on the reef with a depth between 6–8 meters and at 15

meters it is surrounded by fallen boulders. On the east side of the headland, a bay sits under the cliffs.

OCTOPUS ROCK – Another Musandam must see. This little rock is a rock formation which looks like octopus legs underwater. It is located out from the mainland at 22.9nm and 022 degrees from Dibba Port, Oman. The circular island on the surface stretches out in 'tentacle' shapes underwater. Most divers start the dive at the tentacle edges where it is deepest and end the dive closest to the island. This is one of the best dive sites around. There is so much marine life to explore in this area such as shoals of jack fish, fusiliers, snappers, batfish, giant trivally, scorpion fish, slipper lobsters, cuttle fish and seahorses at 150 degrees at around 30m or on the sandy wall which is covered in coral. Entry and exit points are the same. Sometimes there is a mild current present but nothing to worry about.

As mentioned, I had the chance to dive in lots of places within the 2 days. I saw my first sea turtle, lots of angel fish, loads of beautiful corals and some lion fish. It's impossible to give you my favourite dive site amongst them, but the one I have a better memory of is Umm al Fayyarin (the mother of the rat), probably just because of the funny name. This island (whose shape resembles a big rat) is between Habellyn and Shaboos Bay. This dive site/island is separated from the mainland and is in the middle of the sea which is 35.0nm at 024 degrees from Dibba port, Oman

The most common marine life seen around this area are fusiliers, giant trivally, barracuda, angel fish, batfish, turtles, sting rays and schools of mini manta rays. There are combinations of slopes and coral covered walls and table corals at 5–10 meters. This is one of the best dives in the Musandam. Due to its location, it must be dived with an accompanying guide with local knowledge.

You cover the major distances by dhow, which is your base-camp, then you often reach the dive sites with a speedboat. This gives you the chance to enjoy and explore most of the places all around the Musandam; a pleasure not only when you dive, but also when you navigate from the speedboat as you are able to take photographs of the fjords around you or see eagles, herons, seagulls and other birds fishing.

We had chance to try the dhow-cruise thanks to the support of Sheesa Beach Travel and Tourism. Born in 1994, it was the first company in Dibba to offer dhow cruises to tourists. In late 2010 Sheesa Beach Dive Center was launched as a PADI Dive Center and Resort. For more information do not hesitate to contact me or to visit the website www.sheesabeach.com

Ready to cruise and dive, Nico





THE UNDERWATER ARCHAEOLOGY PARK OF BAIÀ

INSTITUTED AS A PROTECTED MARINE AREA IN 2002, THIS IS A MARINE ENVIRONMENT WITH SIGNIFICANT HISTORICAL, ARCHAEOLOGICAL, ENVIRONMENTAL AND CULTURAL VALUE.

FEATURE AND PHOTOGRAPHY **NICOLA DE CORATO** – ADMIN OF DUBAIBLOG, DIVER & HELI RESCUE SWIMMER

The underwater Archaeology Park of Baia was instituted as a marine protected area (MPA) in 2002 by the Ministry of the Environment in agreement with the Ministries of Cultural Heritage and Activities, of Infrastructure and Transport, of Agriculture and Forestry and in collaboration with the Region of Campania.

The area of the underwater Archaeological Park of Baia includes the coastline of Bacoli and Pozzuoli stretching between the port of Baia's southern-most pier (Omlin jetty) and Lido Augustus pier in Pozzuoli and is divided into three categories:

(A) – The heart of the Marine Protected Area in which all activities (except authorized scientific research and services) are forbidden so as to prevent damage and/or destruction of the marine environment;

(B) – An area where sustainable activities with minimal effect on the marine environment are permitted under given regulations;

(C) – A buffer zone between the highly sensitive areas and the open sea in which sustainability and low environmental impact prevails.

In order to dive into the Archaeology Park of Baia you need permission from the local authority; that's why we suggest you plan the dive with an authorized dive center.

Here are the highlights of the Park:

NYMPHAEUM

The Nymphaeum (dating from the first half of

the first century AD) was originally discovered in 1959 when Professor Lamboglia, founder of the centre for underwater archaeology, started his study to determine the morphology of a complete architectonic discovery at the base of Punta Epitaffio.

Ten years later, two marble statues were discovered still standing in the apse of a rectangular building. They have been recognized as part of the Homeric scene of Odysseus offering Polyphemus some strong and undiluted wine.

Of five furthest statues, the most beautiful and least damaged is the one representing the young Dionysus. Another one has been identified as Antonia Minor, Tiberius Claudius Caesar Augustus Germanicus' mother. This is one of the reasons why this place was identified as an imperial residence owned by the Claudian dynasty. The presence of plumbing to control the water flow let the ruins be identified as a luxurious nymphaeum.

There is also a permanent exhibition of the nymphaeum in the Pincer Tower of the Aragonese castle in Baia.

VILLA DEI PISONI

The Pisonian Villa (Villa dei Pisoni) dates back to the first century BC. Archaeological surveys carried out in the late 1980's uncovered a length of lead water piping which was found to have the inscription of Lucius Piso, member

of the powerful and wealthy aristocratic family Piso (which organized a conspiracy against Emperor Nero). The plot was discovered and the family were dispossessed so the villa came into the hands of the Emperor.

Today guided dives follow a pre-established route around a spacious courtyard of 95 x 65m along which it is possible to admire arcades and passages. Like all seaside villas in the area, this villa had fishponds for fish farming. Along one side of this area are the thermal baths, on the other are several rooms which served as a lead through to the maritime area and the large fish breeding pools beyond.

The maximum depth does not exceed 6m and the entire route around the villa is about 150 meters and takes about 40-50 minutes. Please note that it is strictly forbidden to clean, dig, remove or collect objects. Spot checks will be carried out by the coast guard. You are allowed to take pictures, but only if they are not for profit.

PORTUS JULIUS

Portus Julius was commissioned by Marcus Vipsanius Agrippa in 37 BC, during the civil war between Octavian and Sextus Pompey, in order to host the impressive arsenal of the Classis Misenensis, the most important Roman fleet. Its construction was entrusted to the architect Lucius Cocceius Auctus, who decided to realize a connection with Lake Lucrine and Lake Avernus via a navigable canal and to

Cumae by a 1km (0.6 mile) long underground tunnel through which chariots could pass

Pictures taken during World War II illustrate the topography of an extensive portal complex, covering an area of approximately 10 hectares. The details pertaining to the port's construction have, however, been obtained via underwater surveys and observations. Buildings used as warehouses could be identified along with various column arrangements denoting courtyards of residential houses. More personal needs were equally provided for recreational facilities, the Temple of Poseidon and discreet brothels.

The walls and pillars rise from a few inches to more than a meter above the sea-bed and their stonework bears witness to the various building methods used, particularly reticulated work. Pathways, floor mosaics, ceramic wares and even the indication of frescoes can still be found in-situ. The average depth is 4m.

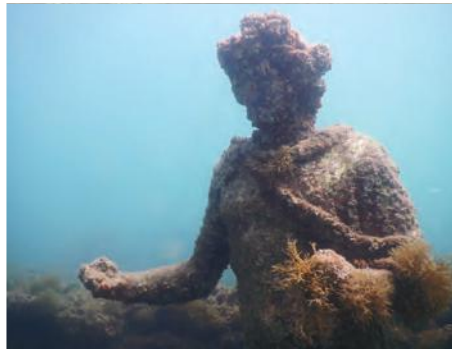
SMOKEY REEF

The location's name is related to the geological aspect – active fumaroles are plentiful and attest the volcanic origin of this area. These fumaroles are columns of gaseous bubbles which escape from the sea bed (at temperatures higher than those ambient) depositing sulphur which covers the surrounding sea floor giving it a white fluffy appearance.

Numerous massive square-based pillars can be found approximately 600m from the shore at Lucrino. They were constructed to provide considerable protection to Portus Julius.

Their heights reach from the sea-bed at depths of up to 16m to several meters below sea-level, protecting the harbour from prevailing currents whilst generating differing light parameters. So in their tops you could find lots of algae, which gradually recedes with depth to reveal an environment typical of the Mediterranean, but also a unique habitat for a wide variety of organisms which adapted to shallower waters than those in which they usually are. Not solely on the pillars themselves but also between them where fallen stonework is to be found, numerous species of fish and all manner of marine life have found refuge.

Ready to cruise and dive, Nico



GETTING THERE: The dive center is in Pozzuoli, very close to Naples (Napoli in Italian), the third most-populated city in Italy and the biggest city in Southern Italy. You can reach Naples via train, bus (main train and bus stations are in Piazza Garibaldi) or plane (flights from other parts of Italy and Europe land at the International Airport of Capodichino). To reach Pozzuoli, take the Cumana Suburban Rail Line operated by SEPSA (Tel: +39-081-551-3328, www.sepsa.it) or the underground (this option is far from the harbour). The closest tourist office is in Pozzuoli at Largo Matteotti 1A (Tel: +39-081-526-6639; www.infocampiflegrei.it).

We had the chance to dive at the Submarine Archeological Site of Baia with the support of Vertigo Dive. The Vertigo Dive Team is made up by International Instructors in diving, surfing, windsurfing and other water sports.

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WHEN THE BUDDY SYSTEM FAILS

HANDLING SEPARATED DIVERS AND COMPROMISED SAFETY

FEATURE **RICK LAYTON**



One of the basic tenets of safe recreational diving is to always dive with a buddy. The theory is that a pair of divers can better manage difficult situations or emergencies than a single diver can. While this point can be argued, most divers as well as certification agencies subscribe to the buddy philosophy.

Despite this fact, incidents of divers becoming separated are not unusual. The sad truth is that whether consciously or by accident, divers can end up alone underwater during various phases of a dive, and sometimes the results can be disastrous. By understanding the issues of buddy separation, we can help prevent potentially dangerous situations from developing.

Divers become separated for many reasons. Referring to diving fatalities occurring in 2003, the 2005 edition of DAN's Report on Decompression Illness, Diving Fatalities and Project Dive Exploration reveals: "A separation of divers was sometimes a matter of choice and sometimes accidental. In at least three cases, the divers may have panicked after losing contact with their buddies. In many cases, the buddies were separated due to poor visibility. In four of these situations, both divers died."

Dive buddies are often engaged in activities that absorb their attention, and consequently they fail to properly monitor one another. When divers become focused solely on their underwater task, a breakdown in the buddy system is likely. As we'll see, environmental conditions, equipment problems and diver attitudes can all conspire to separate buddies. Whatever the reason, the separation of buddies can be the weak link in the diving safety chain.

POOR VISIBILITY

One situation occurred when two divers attempted to recover a sunken outboard motor. According to the report, the diver in question was a 45-year-old male who had earned his openwater certification five years before. He had not been diving for more than a year; still he and his buddy were attempting to recover a sunken outboard motor from the bottom of a lake.

Apparently, the two became separated in the poor visibility that either prevailed or developed during the dive. The diver's buddy surfaced, but he did not. When his body was recovered from a depth of 90 feet (27 meters) two days later, it was found that his

cylinder was empty. While it is unclear exactly what happened to the diver, what is clear, is that he was unable to resolve on his own a problem that developed and ultimately ran out of air.

FAILURES AND MALFUNCTIONS

Another situation that can lead to separation is equipment problems, failure or malfunction. If the lead diver in the buddy pair is not conscientiously monitoring his buddy, a problem that causes the following buddy to stop or pause can quickly lead to separation, especially in poor visibility. In the following report, the divers were in a kelp forest, which, like a terrestrial jungle, is an easy place to become separated.

According to the DAN report, the 41-year-old male diver with an advanced-diver certification had made multiple dives in the kelp bed with his buddies and had been having problems with buoyancy control all day. On the fourth dive of the day, the diver separated from his buddies and ascended. Once at the surface, he called for assistance and soon after lost consciousness.

According to the DAN report, "The death

was determined to be a drowning secondary to an air embolism. The autopsy also disclosed mild coronary artery disease."

Again, it is unclear exactly what trouble the diver experienced and why he separated from his buddies, but clearly he developed a problem that he could not resolve on his own. Had a buddy remained with him and provided assistance, the outcome might have been different.

THE SOB SYNDROME

In some cases, divers intentionally depart from their buddies. This can occur for a number of reasons, including the need to check on navigation or to complete a task while a buddy heads for the safety stop. In some cases, a diver with more air will remain below after others end their dives. Depending on their personal attitudes toward safety, some divers may not see close buddy monitoring as a necessity. Any time divers adopt an "SOB" (same ocean, buddy) approach to safety, the cards may be stacked against them.

Such may have been the case for a 52-year-old diver who had received his open-water certification some six years prior to the accident. He and his buddy became separated after about 15 minutes. The buddy eventually returned to the boat and later found the subject diver afloat, unconscious and with an empty cylinder:

The DAN report reveals that the diver had a medical history that included heart disease and that the diver had complained of chest tightness prior to the dive. Although the cause of death was deemed a drowning, it is suspected that a cardiac event may have contributed to the accident. It is uncertain whether a more attentive buddy could have saved this diver when a suspected cardiac event occurred, but it's a thought worth pondering.

The SOB syndrome may have been the undoing of a diver in the following report as well. An experienced 58-year-old male technical diver using a rebreather to explore a wreck at a depth of 104 feet (32 meters) was part of a four-person buddy team. As the DAN report says, "Before the dive, the diver had complained of fatigue; he did not dive the day before with the others in the group. During this dive, the decedent decided to dive alone. Since he had a habit of doing this, the buddy separation did not alarm anyone."

Unfortunately, something went awry, and the diver was unable to resolve the problem on his own. Although an autopsy was not performed, it appears that a cardiac dysrhythmia contributed to the diver's death. After his body was recovered, an examination of his equipment revealed that although the rebreather was out of gas, his bailout bottle was full. Again, we can

wonder whether a nearby buddy might have made a difference in the ultimate outcome of this, the diver's final dive.

A similar accident occurred when an experienced 41-year-old male diver using a rebreather remained submerged after the other divers had surfaced. Armed with advanced certifications including cave-diver certification, the diver was with a group diving from a liveaboard, but it appeared he did not have a designated buddy for the dive in question. It would seem the diver made a conscious decision to continue diving alone after the others had terminated their diving. The DAN report reveals that the diver "had a habit of diving long after the other divers had exited the water. He had performed previous dives during the trip that lasted up to two hours." The diver never surfaced from this final dive, and the body was never recovered.

SHALLOW 'SAFETY' STOPS

Experienced divers and especially technical divers with a significant decompression obligation often consider it "standard procedure" to make safety stops or decompress alone in shallow water. It may be that the divers simply perceive little or no danger in the waters so close to the surface. As this next accident highlights, serious problems can develop even while waiting to surface from a safety stop in shallow water.

In this case, the 40-year-old was a highly experienced technical diver who had just completed a night quarry dive using a rebreather and nitrox breathing gas. Twelve divers had participated in the dive, which involved poor visibility, and all 12 had ascended to the safety stop at the end of the dive. At the end of the safety stop, all the divers except the subject surfaced. He was later found unresponsive at a depth of 15 feet (5 meters).

A medical examiner ruled the death as a drowning, but an examination of the rebreather revealed that it suffered from poor maintenance and was not functioning properly. According to the DAN report, "There was carbon dioxide absorbent throughout the rig, an oxygen sensor had been inserted incorrectly and was not functioning, and the oxygen addition valve was partially blocked, resulting in a 75 percent decrease in flow. Several loose connections were also present."

Although poor maintenance of the rebreather and its subsequent malfunction may have been the causal factor in this accident, an observant buddy might have detected a problem and provided crucial assistance before the diver perished.

DIVING INTO DANGER

Demanding conditions often separate divers from their buddies during entry or exit. While the divers involved in the following report were not injured, the scenario highlights what

can be a potentially dangerous situation.

A group of three divers were making a daytime dive on an oil rig some 20 miles off the Louisiana coast. It was March and the surface waters in the area were heavily silted by runoff from the Mississippi River, reducing the surface water visibility to less than 2 feet (0.7 meters). The surface water was so murky that no light penetrated beneath the freshwater layer, and dive lights were required to see in the clear underlying water. The divers had planned to descend along the leg of the rig, passing through the low-visibility layer, and, if separated, they would join up in the clear waters below. The surface waters were rough, and a current was running at the surface at the time the divers entered.

During the descent, two of the divers experienced problems and ultimately returned to the dive boat. The third diver successfully negotiated the murky layer and after arriving in the clear water at a depth of 50 feet (15 meters), waited for the two buddies to join him. The diver waited approximately 10 minutes before searching the area around the leg of the oil rig for the two missing divers.

Unable to find them, he concluded that something had happened and he surfaced, rejoining the others on the dive boat. Fortunately nothing went wrong, but if the "solo" diver had experienced a problem, he would have been on his own to sort it out.

A similar situation from the DAN files resulted in a fatality. In this case, a nitrox-certified 56-year-old male diver set out from a liveaboard as a buddy in one of two pairs of buddies. According to the DAN report, "The divers were performing drift dives in a strong current. During the second dive of the day, each buddy team became separated. The decedent and his buddy became separated prior to the descent. They were the last divers off the boat, and the decedent's buddy went below the surface without him. The diver did not return to the boat, and his body was never recovered. His tank and safety sausage were recovered miles from the decedent's last known location."

As these reports suggest, divers should give careful consideration to a situation in which buddies will rendezvous underwater. Demanding conditions at or near the surface can leave a stranded buddy "over his head" and in deep trouble. Divers can also find themselves in more demanding conditions after surfacing than they faced underwater, and staying together can be vitally important, if not impossible.

In the final incident, a 29-year-old female with advanced openwater certification, but fewer than 20 dives since initial certification three years before, was completing a dive with a buddy when something went awry.



© Wolcott Henry 2005/Marine Photobank

According to the DAN report, "[The diver] and her buddy surfaced far from the boat and descended again to swim back. The buddy ran low on air and both divers were fatigued. They became separated and the buddy was rescued on the surface a few hours later. The decedent's body was never recovered, though some of her equipment was found 13 days later."

These accidents emphasize that things can go wrong at the beginning of a dive or on the surface following an ascent. To ensure that nobody is left behind, divers should strive for strict adherence to the buddy system.

The buddy system can be a critical factor in the safety equation for recreational divers. By focusing on this important element throughout all phases of our dives, we can reduce the risk of disaster.

IN DEPTH

TIPS ON HOW TO HELP PREVENT BUDDY SEPARATION

The buddy system is a critical element in recreational diver safety and when it breaks down, lives can be at risk. Consider the following to avoid buddy separation:

- Review buddy separation risks when

planning dives and make certain that the goals of the divers, their equipment and the environment in which they dive will not put the buddy system at risk. Independent goals, mismatched air supply and overly demanding conditions can lead to buddy separation.

- Don't assume the dive begins at some point on or below the surface: It starts as you step into the water.
- When diving in a group, don't assume that everyone is looking out for each other: Each diver should have a buddy and conscientiously monitor that person.
- Avoid dive plans that require buddies to work independently of one another. Distraction leads to separation.
- When one diver leads and the other follows, the "lead" diver should never assume that the "follower" is following. Maintain visual or body contact throughout the dive.
- Don't assume the dive has ended once you reach the safety stop. It doesn't end until all divers are out of the water.



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UPCOMING EVENTS

DIGITAL ONLINE 2014 EXHIBITION

29 May-7 June | 9:00-17:00 week days and 14:00-17:00 on Fridays at the Dubai American University in Dubai, School of Architecture, Art and Design Building (A), Rotunda Gallery.

*All visitors will be asked to show their ID at the main gate to get an entry pass.

WORLD ENVIRONMENT DAY

5 June

WORLD OCEANS DAY

8 June

EDA MOVIE NIGHT @ VOX CINEMAS

2 July – 7.30pm (TBC)

EDA MOVIE NIGHT @ VOX CINEMAS

19 August – 7.30pm (TBC)

EDA MOVIE NIGHT @ VOX CINEMAS

16 September – 7.30pm (TBC)



EDA
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Emirates Diving Association

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MISSION STATEMENT

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

LEGISLATION

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

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

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EDA'S FORD GRANT

The project which was submitted and subsequently won the Ford Grant is called, 'Urchins Versus Fish: Who will Help our Reef's Under Climate Change'.

This project's results will be invaluable in providing insight into the potential changes in herbivore guilds in the Arabian Gulf and how these may affect reef ecosystems in the future.



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Sponsoring Digital Online – EDA's Underwater Photography and Film Competition.

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