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GLOBAL EDITION
Aug-Sep 2011
Number 44



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Island**

Norway
**Nudibranch
Safari**

Tech
**Deep
Diving**

Wrecks
Audace

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**Tagging
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TOFO & ZAVORO
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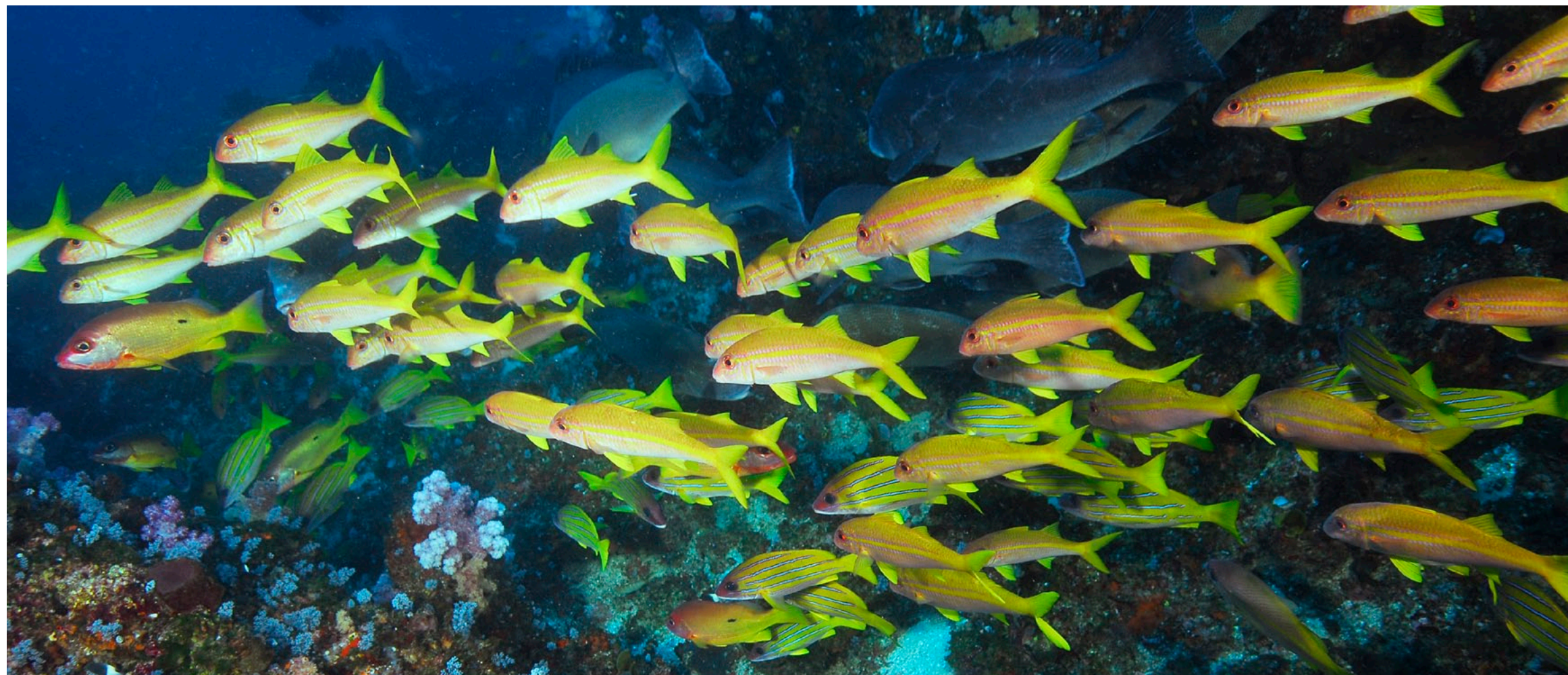
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COVER PHOTO: Frogfish, Mozambique, by Don Silcock
(CONTINUED ON PAGE 4)

contents

Snapper school, Mozambique. Photo by Scott Bennett



13
WRECK WRAP
AUDACE
BY MASSIMILIANO CANOSSA

23
MEGA FAUNA OFF AFRICA
MOZAMBIQUE
BY DON SILCOCK

33
TOFO & ZAVORA
MOZAMBIQUE
BY SCOTT BENNETT

54
DIVING THE ISLANDS
OF THE BAHAMAS
BY CHARLES STIRLING

65
GRAND BAHAMA ISLAND
DIVING DIVERISTY
BY MATTHEW MEIER

79
PROFILE:
WOLFGANG LEANDER
BY ARNOLD WEISZ

96
NUDIBRANCH SAFARI
NORWAY
BY CHRISTIAN SKAUGE

columns...

83
TECH TALK: AQUACORPUS
DEEP DIVING MOTIVATION
BY WES SKILES

86
SHARK TALES: TAGGING
SHARKS IN PALAU
BY GEORGINA WIERSMA

89
UW PHOTO:
NATURAL LIGHT
BY LAWSON WOOD

plus...

EDITORIAL	3
NEWS	4
WRECK RAP	13
TRAVEL NEWS	20
EQUIPMENT NEWS	50
MARINE MAMMALS	51
TURTLE TALES	77
BOOKS & MEDIA	78
SHARK TALES	86
PHOTO NEWS	94

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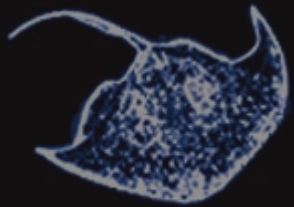
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X-ray mag

News edited
by Peter Symes
& Arnold Weisz

NEWS *deep blue*

Major Scientific Discovery on the Mid-Atlantic Ridge

The Irish-led VENTuRE scientific expedition aboard the national research vessel, *RV Celtic Explorer*, has discovered a previously uncharted field of hydrothermal vents along the Mid-Atlantic Ridge—the first to be explored north of the Azores.

The mission, led by Dr Andy Wheeler of University College-Cork (UCC) together with scientists from the National Oceanographic Centre and the University of Southampton in the United Kingdom, the National University of Ireland-Galway (NUI) and the Geological Survey of Ireland, returned to Cork August 4 from an investigation 3,000 metres below the surface of the sea using the Remotely Operated Vehicle (ROV) *Holland 1*.

Hydrothermal vents, which spew

mineral-rich seawater heated to boiling point by volcanic rock in the Earth's crust below, are home to a rich variety of marine life that thrives in complete darkness on bacteria fed by chemicals.

The investigation was supported by the Marine Institute under the 2011 Ship-Time Programme of the National Development Plan and by the National Geographic Society, who filmed the work for inclusion in an upcoming National Geographic Channel series, "Alien Deep", premiering globally in 2012.

"On the first dive, we found the edge of the vent field within two hours of arriving on the seafloor," said Wheeler. "The ROV descended a seemingly bottomless underwater cliff into the abyss. We never reached the bottom, but rising up from below were these chimneys of metal sulphides belching black

plumes of mineral-rich superheated water. Often the search for vents takes much longer, and our success is a testament to the hard work and skill of everyone on board."

Dr Bramley Murton of the National Oceanography Centre in the United Kingdom, who first saw clues for possible vents on an expedition aboard the U.K. research vessel, *RRS James Cook*, in 2008 and who led the mineralisation study on the expedition, said, "Our discovery is the first deep-sea vent field known on the Mid-Atlantic Ridge north of the Azores. Although people have been crossing this ocean for centuries, we are the first to reach this spot beneath the waves and witness this natural wonder. The sense of awe at what we are seeing does not fade, and now we are working hard to understand what our discovery tells us about how our planet works."

Patrick Collins from NUI Galway's Ryan Institute, who led Ireland's marine biological team investigating this unique ecosystem, is working in collaboration with Jon Copley of the University of Southampton to catalogue and characterise the species found at the vents. ■

For the first time ever seen by human eyes—the Moytirra vent field. Picture shows chimneys of metal sulphides (black and rust coloured) at 3,030 metres below sea level



Huge Biomass Gains at Cabo Pulmo National Park

A large Gulf grouper of 1.2m (*Mycteroperca jordani*) waiting for cleaning fish beside the reef

A thriving undersea wildlife park tucked away near the southern tip of Mexico's Baja peninsula has proven to be the world's most robust marine reserve in the world, according to a new study led by researchers at Scripps Institution of Oceanography at UC San Diego in the United States.

Results of a ten-year analysis of Cabo Pulmo National Park (CPNP), published in the Public Library of Science (PLOS) ONE journal, revealed that the total amount of fish in the reserve ecosystem (the "biomass") boomed more than 460 percent from 1999 to 2009. Citizens living around Cabo Pulmo, previously depleted by fishing, established the park in 1995 and have strictly enforced its "no take" restrictions.

"We could have never dreamt of such an extraordinary recovery of marine life at Cabo Pulmo," said National Geographic Explorer-in-Residence Enric Sala, who started the study in 1999. "In

1999, there were only medium-sized fishes, but ten years later, it's full of large parrotfish, groupers, snappers and even sharks."

The most striking result of the paper, the authors said, is that fish communities at a depleted site can recover up to a level comparable to remote, pristine sites that humans have rarely fished.

"The study's results are surprising in several ways," said Octavio Aburto-Oropeza, a Scripps postdoctoral researcher, World Wildlife Fund Kathryn Fuller fellow and lead author of the study. "A biomass increase of 463 percent in a reserve as large as Cabo Pulmo (71 square kilometers)

represents tons of new fish produced every year. No other marine reserve in the world has shown such a fish recovery."

The paper notes that factors such as the protection of spawning areas for large predators have been key to the reserve's robustness. Most importantly, local enforcement, led by the determined action of a few families, has been a major factor in the park's success. Boat captains, dive masters and other locals work to enforce the park's regulations and share surveillance, fauna protection and ocean cleanliness efforts. ■



Huge high seas reef found at almost 400 meters

The finding proves that there are still unexplored areas in this region that may harbor many more surprises.

The international conservation organization, Oceana, announced the discovery

of a deep-sea, white coral reef in the Alboran Sea (Western Mediterranean)



IMAGE COURTESY OF OCEANA

during the Oceana Ranger's 2011 expedition. The international marine conservation organization estimates that the reef's surface area may exceed ten hectares (over 100,000 square meters) and covers a large part of the surface of a seamount whose peak is located between 320 and 400 meters depth. Deep-sea corals area among the most vulnerable ecosystems and the United Nations has called for their protection. Most of these interesting communities have disappeared from large extensions of European waters and the Mediterranean due to bottom trawling, changes in water temperature or natural catastrophic events.

Information about the existence of these corals in the Mediterranean is not complete and usually concerns small colonies or dead reefs. In this case, the reef still maintains important live colonies growing on structures older than the dead corals, reaching a height of over one and a half meters.

Alborean Sea

The discovery was made in the southeast

Coral (*Anthomastus cf. Grandiflorus*) Alboran Sea, Image is from the Oceana Ranger Expedition 2011

Deep-sea corals area among the most vulnerable ecosystems and the United Nations has called for their protection.

Alboran Sea, in international waters. The seamount was inspected by an underwater robot that can descend to 600 meters depth, which also provided spectacular images of other habitats of ecological importance.

Coral forests

"We are not only talking about a large coral reef but also extensive gorgonian gardens, black coral forests and glass sponge fields, all of these important habitats for the health of the Mediterranean," explained Ricardo Aguilar, Director of Research of Oceana Europe. "In addition, we can highlight the presence of rare or little known species, such as ball corals, carnivorous sponges, the bathyal octopus and the sail ray."

Barcelona Convention

Oceana will present this data to the Barcelona Convention so it can act quickly and declare new marine protected areas in the Mediterranean in order to preserve the last coral reefs and the valuable ecosystems that still exist in this sea. ■



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- Szilvia Gogh



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Tool use in fish

Fish, once thought a "simple reflex animal", has cognitive abilities to rival birds, reptiles and mammals.



A sequence of photos taken by marine biologist, Scott Gardner, shows a green wrasse known as a tuskfish picking up a cockle and smacking it against a rock to open it up. While scientists have known for about 50 years that a few dozen species of fish use rocks as tool-like implements, it is the first time that anyone has seen and recorded a fish using tools in the wild.

"The pictures provide fantastic proof of these intelligent fish at work using tools to access prey that they would otherwise miss out on," said Culum Brown of Macquarie University in Sydney. "It is apparent that this particular individual does this on a regular basis judging by the broken shells scattered around the anvil."

What specifically constitutes tool use is a controversial topic. Is a seagull using a tool when it drops a shellfish on a rock? How about when archerfish spray a jet of water to knock prey off of twigs?

Last year, a team of international scientists revealed that freshwater stingrays use water as a "tool" in problem-solving tests. Dr Michael Kuba from the Hebrew University of Jerusalem, Israel, and his team tested the ability of captive South American stingrays (*Potamotrygon castexi*) to solve problems, by setting them a series of underwater tasks.

Using a plastic pipe with one end sealed and containing hidden food, researchers observed how the fish overcame the challenge of getting the meal from the container. They also tested the fish to see if it could discriminate between black and white ends of the tube.

The stingrays not only performed the tasks well but also demonstrated a range of problem-solving strategies, including using water as a "tool" to obtain the hidden reward. ■

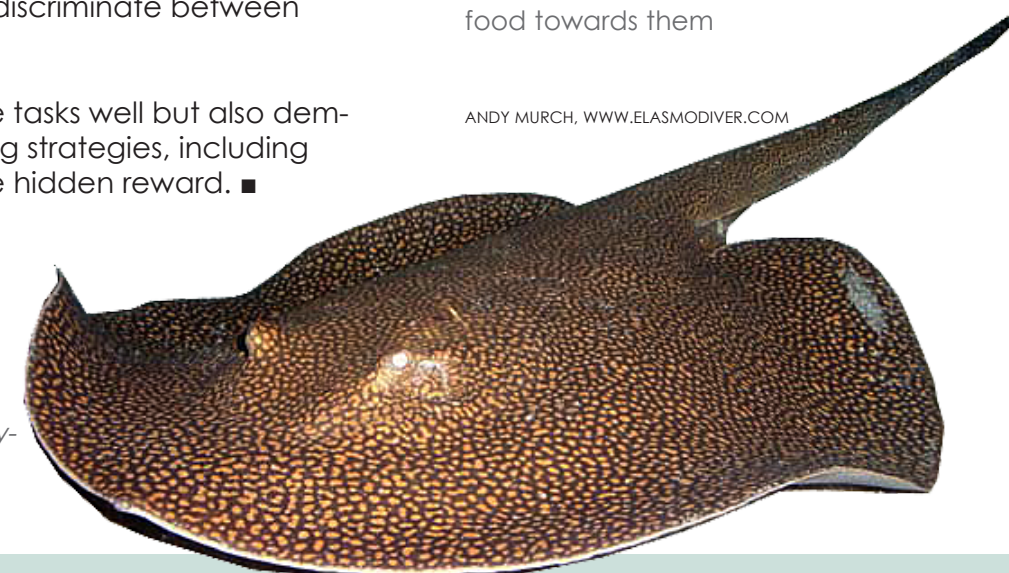
A blackspot tuskfish off Australia has its mouth full as it carries a cockle to a nearby rock, against which the fish was seen repeatedly bashing the shellfish to get at the fleshy bits inside

Tool use is more common in fishes than we realize.

—Culum Brown, Macquarie University

The definition of tool use, using an agent to achieve a goal, was set by cognitive scientist, Dr Benjamin Beck, in 1980. The stingrays meet this definition by using water as a tool, manipulating their bodies to create a flow of water that moves food towards them

ANDY MURCH, WWW.ELASMODIVER.COM



The South American stingray (*Potamotrygon castexi*) is a freshwater species

PHOTOGRAPH COURTESY SCOTT GARDNER

White band disease in corals might be treatable with antibiotics

Antibiotics, the ubiquitous cure for human ills, also may be a treatment for white band disease affecting certain coral species

A recently published study led by a Scripps scientist has pinpointed bacteria as the cause of "white band disease" (WBD)—one of the world's most damaging coral

diseases. The disease contributed to a massive die-off of two of the most common shallow-water coral species in the Caribbean, wiping out up to 90 percent of these species on many reefs. The disease earned its name because its contagious death grip typically starts at the base of coral as a white band of dead tissue and works its way upwards, in certain cases at a couple of centimeters per day.

David Kline of Scripps Institution of Oceanography in La Jolla, California, and research teammate Steven Vollmer applied WBD tissue to healthy coral fragments then compared transmission rates using various filtering measures. Coral tissue with white band disease was broken up by a homogeniser, which is basically a blender. The resultant fluid is known as the homogenate, which is then filtered to



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remove any complete cells and large pieces of debris.

The untreated disease ho-

White band disease has caused unprecedented declines in *Acropora cervicornis* and *Acropora palmata* corals, both now on endangered species lists

mogenate resulted in a 90 percent transmission rate. When the homogenate was filtered but still contained bacteria and viruses the transmission was 80 percent, while a filter that excluded most bacteria and contained mainly viruses resulted in only a ten per-

cent transmission rate. Kline and Vollmer said the findings implicate bacteria as the primary pathogens of one subtype of the disease, and suggest viruses alone aren't likely to be the disease's cause. ■

SOURCE: SCRIPPS INSTITUTION OF OCEANOGRAPHY



Warming oceans causes massive movement of marine species

Global warming is causing the largest movement of marine species seen on Earth in more than two million years, according to scientists.

Marine species, ranging from tiny species of plankton, several fish species and even whales have shifted their range into waters where they either had vanished

from or never been observed ever before.

Melting ice opens passage

After a tiny species of plankton called *Neodenticula seminae* went extinct in the North Atlantic about 800,000 years ago, it has now returned. The microscopic plant has become an Atlantic resident again, having drifted from the Pacific through the Arctic Ocean thanks to dramati-

cally reduced polar ice, scientists report. The melting Arctic has opened a Northwest Passage across the Pole for the tiny algae. And while it's a food source, it isn't being welcomed back by experts, who say any changes at the base of the marine food web could, like an earthquake, shake or even topple the pillars of existing Atlantic ocean life. The discovery represents "the first evidence of a trans-Arctic migration in modern times" related to plankton, according to the U.K.-based Sir Alister Hardy Foundation for Ocean Science, whose researchers warn that "such a geographical shift could transform the biodiversity and functioning of the Arctic and North Atlantic marine ecosystems."

Huge consequences

As the waters of the Atlantic and the North Sea warm, a valuable member of the copepod family known as *Calanus finmarchicus* (zooplankton), a rich and crucial source of oil, is being replaced by varieties that are smaller and less nutritious. The consequences are already evident. The changes in plankton life have "been related to the collapse of some

fish stocks" as well as declines in fish-eating North Sea birds, the researchers report. Harbour porpoises migrated from the northern North Sea when sand eels, a mainstay of their diet, moved poleward with the nutritious copepods.

Overall, studies show that re-arrangements of marine life composition is likely to be mixed—some species could, in fact, thrive and parts of the ocean gain in biodiversity and productivity.

"But most of the impacts are so clearly negative, and the scope of change so potentially huge that, taken together, they constitute brightly flashing warning signals," said Carlo Heip, director general of the Royal Netherlands Institute for Sea Research, which leads the CLAMER project.

Fish on the move

Nearly two-thirds of 36 exploited and non-exploited North Sea fish species studied from 1977 to 2001 have shown shifts in mean latitude and/or depth in response to climatic warming. In 15 of 36 studied species, including Atlantic cod (*Gadus morhua*) and common sole (*Solea solea*), centres of distribution shifted by distances

ranging from 48 to 403km, most of them northward. In the North Sea, several fish species, including sea bass, mullet, solenette and scaldfish, are moving northward and increasing in numbers as the water warms, according to experts at the Royal Netherlands Institute for Sea Research and the Netherlands Institute for Ecology (NIOO).

Pacific whale in the Atlantic The tiny marine plant's migration parallels, near the extreme opposite end of the ecological weigh scale, the arrival last year of a gray whale (*Eschrichtius robustus*) spotted off the coasts of Spain and Israel, a species that vanished from the Atlantic three centuries ago, likely because of overhunting. Scientists believe the ice-reduced Arctic allowed the whale to cross into the North Atlantic, from where it wandered its way to the Mediterranean Sea.

These are among a number of reports about the marine life upheaval underway in the North Atlantic due to climate change, findings being captured and cataloged by project CLAMER, a collaboration of 17 marine institutes in ten European countries. ■



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Multiple ocean stresses threaten “globally significant” marine extinction

An international panel of marine experts warns in a report released recently that the world’s ocean is at high risk of entering a phase of extinction of marine species unprecedented in human history.

The preliminary report arises from the first ever interdisciplinary international workshop to consider the cumulative impact of all stressors affecting the ocean. Considering the latest research across all areas of marine science, the workshop examined the combined effects of pollution, acidification, ocean warming, over-fishing and hypoxia (deoxygenation).

Dramatic decline

Marine scientists from institutions around

the world gathered at Oxford University under the auspices of IPSO and the IUCN. The group reviewed recent research by world ocean experts and found firm evidence that the effects of climate change, coupled with other human induced impacts such as over-fishing and nutrient run-off from farming, have already caused a dramatic decline in ocean health.

“The world’s leading experts on oceans are surprised by the rate and magnitude

of changes we are seeing. The challenges for the future of the ocean are vast, but unlike previous generations we know what now needs to happen. The time to protect the blue heart of our planet is now, today and urgent,” said Dan Laffoley, marine chair of IUCN’s World Commission on Protected Areas and senior advisor on marine science and conservation for IUCN, and co-author of the report.

Main conclusions

The findings underscore the need for more effective management of fisheries and pollution and for strengthening protection of the 64 percent of the ocean that lies beyond the zones of national jurisdiction.

- The combination of stressors on the ocean is creating the conditions associated with every previous major extinction of species in Earth’s history.
- The speed and rate of degeneration in the ocean is far faster than anyone has predicted.
- Many of the negative impacts previously identified are greater than the worst predictions.
- Although difficult to assess because of the unprecedented speed of change, the first steps to globally significant extinction may have begun with a rise in the extinction threat to marine species such as reef-forming corals.



Silt and sand cover a coral reef



Vaccuming menhaden into fishing vessel from purse seine net in Chesapeake Bay. In 2005, a harvest cap was established due to overfishing concerns



Motu Agriculture. Farms cover the motus, small islands formed along the barrier reef, surrounding Huahine, French Polynesia. Agriculture is an important source of food and income on small islands throughout the Pacific, but heavy pesticide use and runoff from industrial farming operations threatens nearby coral reefs

Better governance

Meanwhile one of the primary contributors to the study, Dr Alex Rogers, scientific director of the International Programme on the State of the Ocean (IPSO) said: “This is a very serious situation demanding unequivocal action at every level. We are looking at consequences for humankind that will impact in our lifetime, and worse, our children’s and generations beyond that.”

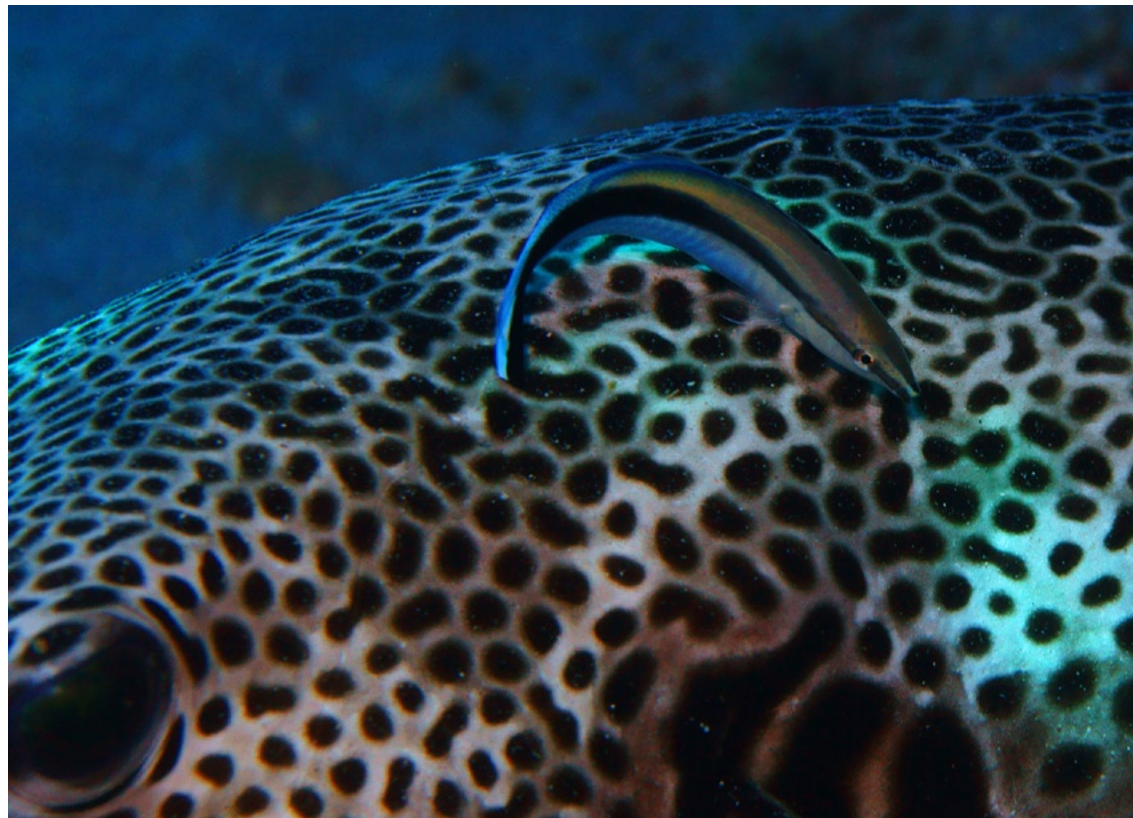
The report sets out a series of recommendations and calls on states, regional bodies and the United Nations to enact measures to better conserve ocean ecosystems, and in particular demands the urgent adoption of better governance of

the largely unprotected high seas, which make up the majority of the world’s ocean. ■

“The findings are shocking. As we considered the cumulative effect of what humankind does to the ocean the implications became far worse than we had individually realized”.

— Dr Alex Rogers, Scientific Director of the International Programme on the State of the Ocean (IPSO)

Male cleaner fish distinguish between high and low value meals and will punish the female more severely if she drives off a high-value client



Fish weight-watchers

Telling the female to watch her weight doesn't sound like a good strategy for a male in a partnership—unless you are a male cleaner fish, that is.

Cleaner wrasse eat parasites that have attached themselves to the client fish but sometimes the cleaner fish can't resist the temptation to take a bite out of the client's mucus layer. And because it's a painful bite the client fish ends the co-operation, shakes off the cleaner fish and swims away.

Punishment

Females that bite clients will then receive aggressive punishment from their male partners for such greedy behaviour. The female fish will respond to this punishment by providing better service to high value clients in the future.

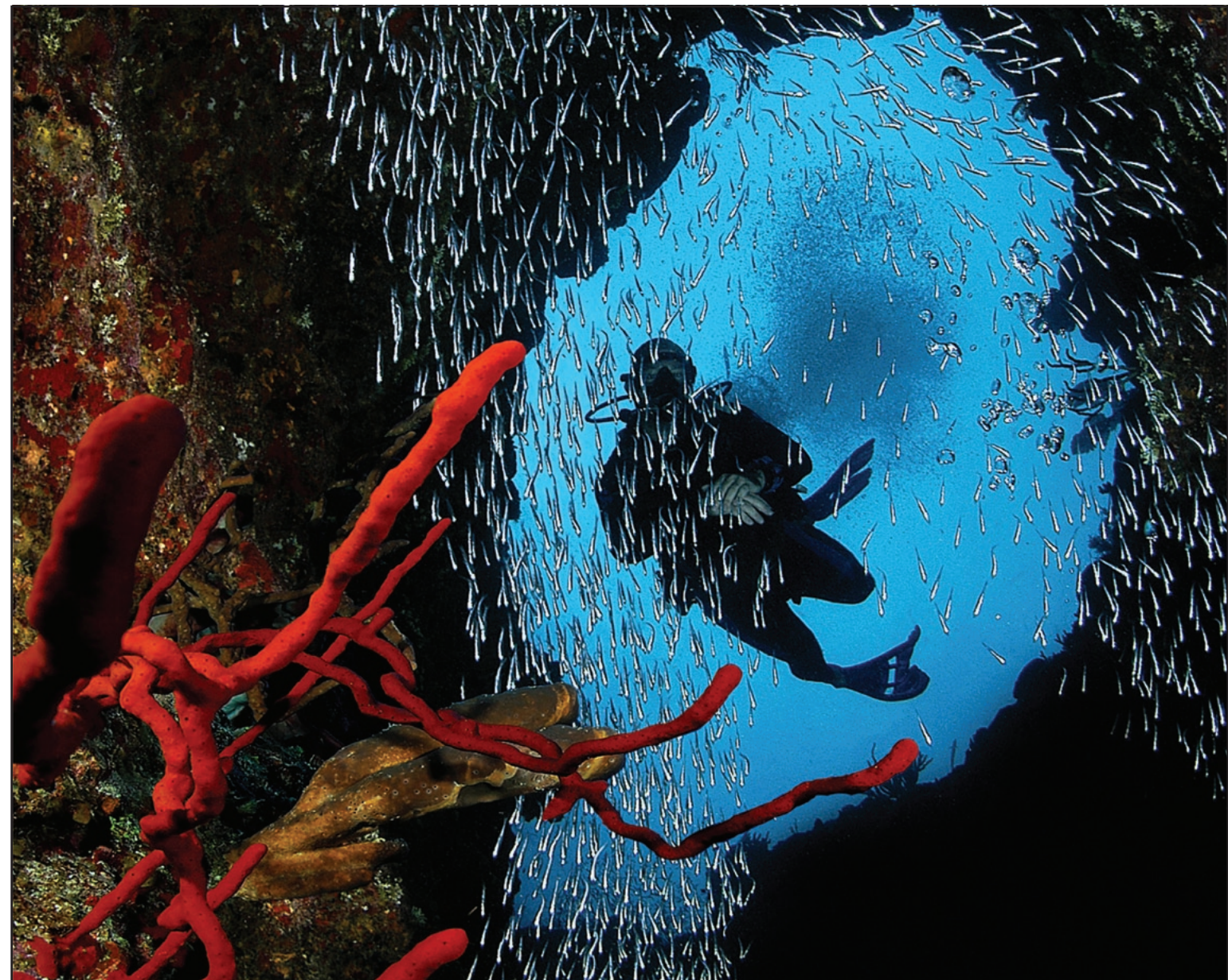
A lot to lose

The male fish lose more than just a meal from their partner's big appetite; they also risk the female becoming so large that she will turn into a rival male. All cleaner fish are born female and turn into males when they become the biggest fish in their group.

Dominance

Cleaner fish live in groups led by one dominant male with a harem of up to 16 females. A male cleaner fish usually partners with the biggest female fish in the harem for cleaning duties.

"Our research shows that male cleaner fish are sensitive to their female partner's size. One reason for keeping a cheating female in check may be to stop her eating too much and then challenging his position as the dominant male on the reef," said Dr Nichola Raihani, lead author from the Zoological Society of London. ■



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Edited by
Peter Symes

PADI endorse VR Sentinel for rec tec courses

The PADI organization will soon issue the 20 millionth diver certification. In recognition of this milestone, PADI Regional Headquarters around the world are giving a dive trip for two to Australia's Great Barrier Reef. PADI has been tracking certifications and will announce the winner after this goal has been reached. A countdown counter has launched on the PADI website that provides daily updates as the organization approaches this achievement, which they expect to reach by late September.

The diver to receive PADI's 20 millionth certification will win an all-expense-paid trip for two to explore a natural wonder of the world, the Great Barrier Reef, and other local attractions such as the World Heritage listed Daintree Rainforest, courtesy of Tourism Queensland. Dive excursions out to the Great Barrier

Reef will be provided by *MV Spirit of Freedom*, which includes a three-day, three-night live-a-board adventure to iconic dive sites such as Cod Hole and the stunning Ribbon Reefs. In addition, the PADI Instructor to issue the 20 millionth diver certification and the affiliated dive center or resort will each receive a trip to Australia.

"It is incredible to see what started as an idea by Ralph Erickson and John Cronin nearly 45 years ago, has grown into *the way the world learns to dive*," said Brian Cronin, chief executive officer for PADI Worldwide.

"The fact that PADI is nearing its 20 millionth certification is a testament to the power and wisdom of their vision, as well as the talent and dedication of PADI Instructors across the globe. We are proud that this organization has been able to introduce people to new life changing experi-

ences through diving, and we look forward to the next 20 million." ■



PADI to award 20 millionth scuba diving certification

VR Technology and PADI have reached an agreement on CCR training on the Sentinel. Kevin Gurr from VR Technology said, "We are very pleased that PADI has accepted our technical level products as some of the first suitable for their training programs. We have also worked closely with PADI to ensure the sport rebreather is ideally suited to their recreational programs. We are excited about the news, and we feel it is a big endorsement of our approach to the technology and rebreather safety in general."

The recreational courses—PADI Rebreather Diver and PADI Advanced Rebreather Diver—will be launched in Third Quarter 2011 with the first of the technical courses—Tec 40 CCR launching around November, followed by the Tec 60 CCR towards the end of 2011 and Tec 100 CCR in the first few months of 2012. The Sentinel and Sentinel Expedition are VR's Technical level units and the new Sport Rebreather is due to launch in November this year for the recreational level course. ■



InnerSpace Explorers partners with Tourism Unlimited to drive international expansion

With the certification of new instructors who now offer courses in countries like Malaysia, the Philippines and Croatia, InnerSpace Explorers (ISE) aims to reach a larger group of divers and has assigned the Munich-based agency, Tourism Unlimited, with public relations and marketing tasks. President and founder of ISE, Achim Schloeffel, has a clear vision in mind: "Diving has become a popular sport for the masses. But many divers do not accept the limits set by traditional dive training organizations. We aim to enable divers to expand their individual limits. Along with this, it is crucial to train safety in combination with the consciousness about potential risks that be linked to the respective dive profile."

ISE is an international dive training organization putting its focus on the exploration of the underwater world as well as on teaching technical diving skills. The challenging trainings and workshops demonstrate the participants their individual limits in diving along with solutions how to overcome those barriers. The

skills and knowledge acquired by the students allows them to participate in exciting exploration projects and to always "stay cool" even in extreme situations.

"We also want to offer exciting projects to our students where they can apply the skills learned. Hence, we will organize exclusive dive trips and research projects. The team of Tourism Unlimited is a strong partner who supports us competently in the strategic positioning as well as in communicating and marketing our offers," said Schloeffel.

For more information about InnerSpace Explorers, please visit: www.is-expl.com ■



BSAC to launch a brand new members' magazine

BSAC is creating an all-new monthly magazine for their members and the diving community. The first issue of *SCUBA* will be launched in November 2011. *SCUBA* will succeed *DIVE* as the official magazine of BSAC. Mary Tetley, Chief Executive of BSAC, said she was looking forward to going into 2012 the Olympic year

—with a brand new magazine for BSAC members and the sport: "Our magazine is a vital part of the way we communicate with our members and ensures we provide you with the essential information you need to get the best out of your membership. *SCUBA* will be developed in response to the recent BSAC



member survey and to our members." The magazine will include more news, stories and features on United Kingdom and BSAC club diving as well as all the important developments in the sport. In addition, *SCUBA* will ensure:

- The BSAC magazine continues to be innovative, attractive, inter-

esting and relevant to their members

- BSAC has the opportunity to manage and grow their own magazine, providing a clearer voice for their members as well as the diving community as a whole.

For more info: www.bsac.com ■





JAMES W. PORTER, UNIVERSITY OF GEORGIA

Disease-free coral colonies are rare during a White Pox disease outbreak, but some colonies (such as those shown here from Molasses Reef) may have natural resistance to this bacterium and may live to recolonize the reef

Human pathogen killing corals in the Florida Keys

A research team from Rollins College in Florida and the University of Georgia in the United States has identified human sewage as the source of the coral-killing pathogen that causes white pox disease of Caribbean elkhorn coral.

Once the most common coral in the Caribbean, elkhorn coral was listed for protection under the United States Endangered Species Act in 2006, largely due to white pox disease.

"When we identified *Serratia marcescens* as the cause of white pox, we could only speculate that human waste was the source of the pathogen because the bacterium is also found in the waste of other animals," said Kathryn P. Sutherland, associate professor of biology at Rollins College.

In order to determine a source

for the pathogen, the research team collected and analyzed human samples from the wastewater treatment facility in Key West and samples from several other animals, such as Key deer and seagulls. While *Serratia marcescens* was found in these other animals, genetic analyses showed that only the strain from human sewage matched the strain found in white pox diseased corals on the reef. The final piece of the investigative puzzle was to show that this unique strain was pathogenic to corals.

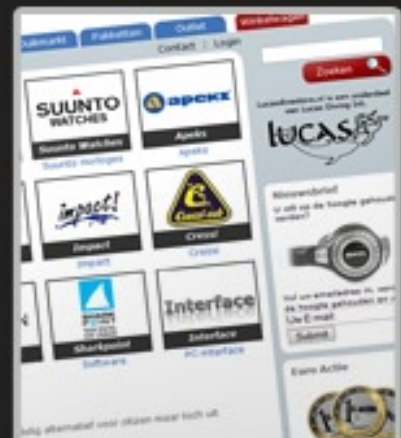
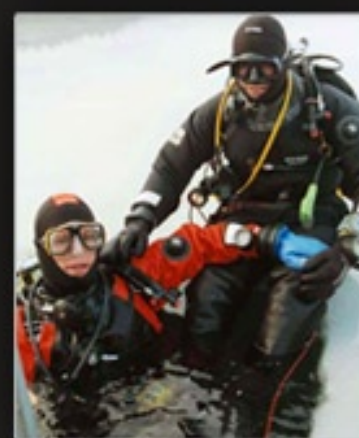
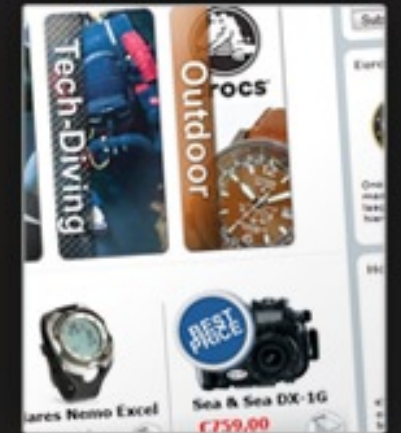
"The strain caused disease in elkhorn coral in five days, so we now have definitive evidence that humans are a source of the pathogen that causes this devastating disease of corals," Sutherland said.

"These bacteria do not come from the ocean, they come from us," said Porter. Water-related activities in the Florida Keys generate more than \$3 billion a year for Florida and the local economy. "We are killing the goose that lays the golden egg, and we've got the smoking gun to prove it," Porter said. ■



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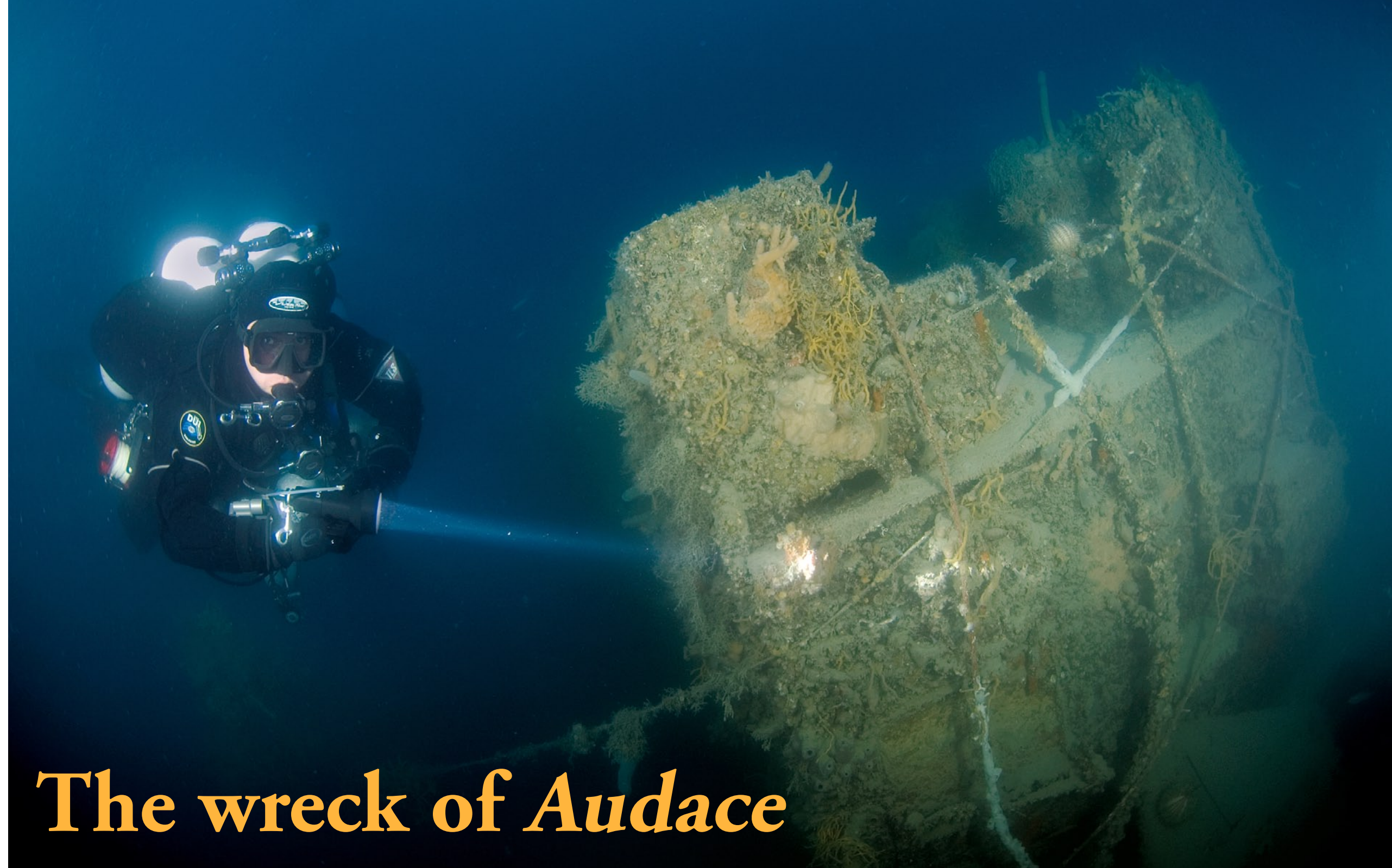
Written by Massimiliano Canossa
Historical consulting by Cesare Balzi
Underwater photos by Federico
Mattiello and Massimiliano Rancan
Translation by Gioele Pesenti

Captured in Venice by the Germans in September 1943 and renamed *TA-20*, the *Audace*—formerly an Italian destroyer—sank in the Adriatic Sea near the north of Zara (now Zadar, Croatia) on November 1 during a battle against British units. During the exploration of the wreck, the Nautica Mare Dive Team (NMDT) acquired a lot of images and important information on this vessel.

Groundwork

It was August 1999 when for the first time I read an article written by Pietro Spirito about “Il piccolo” of Trieste. The article discussed the discovery of a wreck by a group of local divers. It was the Italian destroyer, *Audace*. I stored the page carefully with the intent to look deeper into the story of this ship.

Ten years later in 2008, I was in Croatia to explore some wreck with the project Adriatic Exploration 2008. The target of this mission was the Austro-Hungarian steamships, *Albanian* and *Euterpe*, off Pag Island.



The wreck of *Audace*

Local fisherman told me about a German wreck called *TA 20* that sank in the area and could be found at a depth of 80m. It was not a famous wreck, and it was not a common dive site for the local diving community. But we still had couple of days left, so we started to search for the *TA 20* without success.

On the second day of our search, the echo-sounder showed something. We decided to go down and check it out.

At the bottom, the conditions were very bad—poor visibility and strong current. However, we did see a wreck—crusted over, armed and laid on its left side. It was the *TA 20*. The information we had was correct.

We had just enough time to take a few photos, and after ten minutes, we decided to come back up. The weather conditions continued to not be so good, so we stewed in Italy with a bad taste in

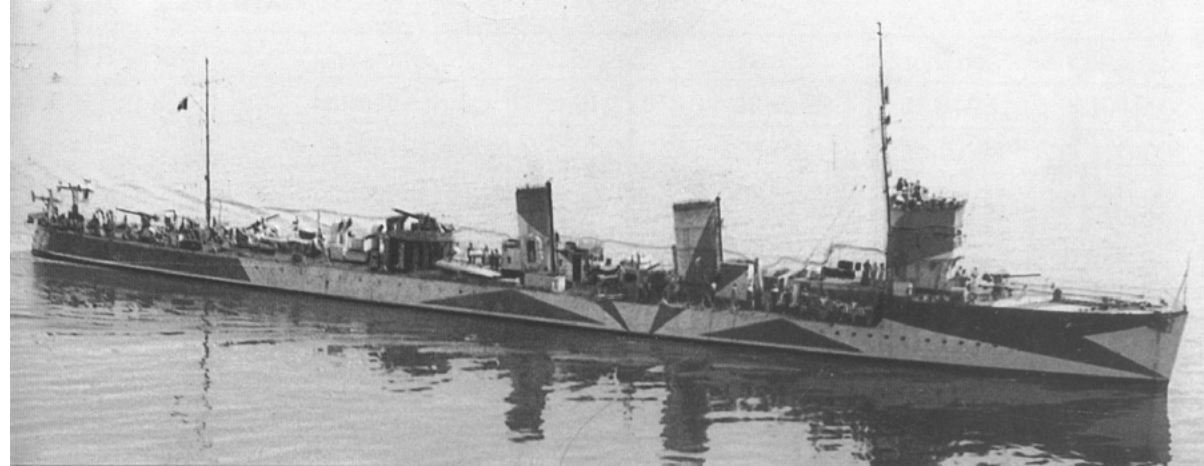
our mouths.

Right away, I decided to do some historical research, which led me to the realization that the *TA 20* was simply the ex-Italian destroyer, *Audace*. The article by Pietro Spirito ten years earlier confirmed my thoughts. There was no underwater image of this wreck, so I alerted the NMDT guys to this, and in a few days, we had a team of eight divers ready for this new adventure.

History

Audace's history is a singular and interesting one. During WWI, the Japanese Navy ordered ships from foreign countries in order to acquire new technologies. With this goal in mind, the Japanese ordered two destroyers, called the *Kawakaze* and the *Urakaze*, from the Yarrow shipyard in Glasgow, United Kingdom.

Construction was delayed due to a



LEFT TO RIGHT: Trieste quay plate *Audace* (left); *Audace* sails with camouflage in 1942 coll. Bagnasco; September 1943 *Audace* in Arsenale in Venice



with 12 of those extending to upper deck.

Unity was equipped with two mine sweepers of the C kind, eight bombs and one tow-torpedo called "Ginocchio" fixed to the stern of the ship. It was a very good ship, with a long cruising range and good nautical quality.

On 9 June 1917, *Audace* was in Naples to finish armament. In March of the next year, it was in Brindisi, when the navigation convoy of the submarines *H1* and *H2* arrived from Canada.

Throughout WWI, *Audace* operated in the Adriatic Sea.

Audace's most important feats were accomplished in November 1918. In fact, it was the first ship to land in Trieste on 3 November 1918, and on November 7 for the landfall in Zara, with the Italian army aboard as well as food for civilians. On November 10, *Audace* landed in Trieste with King Vittorio Emanuele III aboard as well as the field marshals, Armando Diaz and Pietro Badoglio. The quay there is still called *Audace* quay.

In Seberica on 23 December 1918, the unit rescued the British steamship,

Queen Elizabeth, which was damaged by a mine in the area of Punta Maestra. From 1919 to 1921, *Audace* operated in the north Adriatic.

In 1923, it was serviced in Tripoli, and in August, it was deployed on a secret mission with a crew of the

Allied Forces on board.

In 1928, *Audace* came back to Taranto as a flagship and was used for a training exercise in the seas around Greece. During the civil war in Spain, *Audace* was active in some offensive actions. From 1940 to 1943, *Audace* was

designated a school ship in Pola. During this time, the vessel was also used as an anti-submarine and escort ship, especially in 1942.

At the time of armistice promulgation, *Audace* was in Trieste and left the harbour for Venice. From here, she moved



Diver on main deck



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IN 2011
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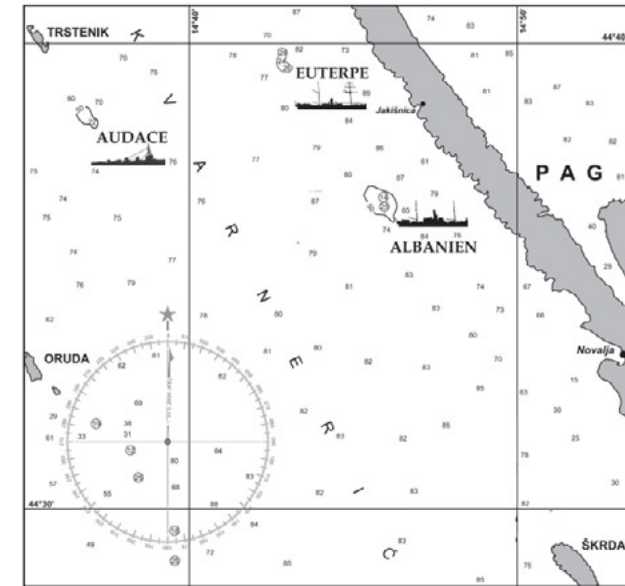


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CLOCKWISE FROM FAR LEFT: Diver on the main deck; Depth bombs on *Audace* wreck; Wreck positions on map; Post dive break; Profile of *Audace* from 1918 to 1943

Audace



TECHNICAL DATA OF TA20 (ex-AUDACE)
 Shipyard: Yarrow of Glasgow, Scotland (United Kingdom)
 Ordered: October 1, 1913
 Launched: September 27, 1916
 Delivered: December 23, 1916
 Displacement: 1250 tons and 1364 tons at full load
 Armament (under Regia Marina): 450 4xLS in plants combined, 7x102/35 single individual 2x 40/39 singular
 Armament (under Kriegsmarine): 2x102mm/45, 2x37mm Breda, 6x20mm/65
 Engine: Yarrow boilers superheated steam 2 turbines Curtiss-Brown - 22000 HP - 2 propellers
 Speed: 27 knots effective (maximum 30 knots)
 Fuel: 252 tons naphtha
 Range: 2180 miles at 15 knots and 630 miles at 30 knots
 Dimensions: Length, 87.59m; width, 8.38m; height, 2.50m at the bow and 2.89m aft
 Crew: 5 officers and 113 sailors

to south Italy, but had to go back due to engine failure. During the German occupation in Venice, she was captured and renamed *TA20*.

Expedition

Our departure was set for the first week of July. Meanwhile, I tried to find out more about the actual condition of the wreck. With no underwater pictures to be found on the Web, I was worried about it, because I knew that in the area of the wreck, there was a lot of trawling activity, which makes visibility very poor—close to zero, I would say.

In addition to myself, the expedition team was composed of three photographers, two video-operators and two safety divers.

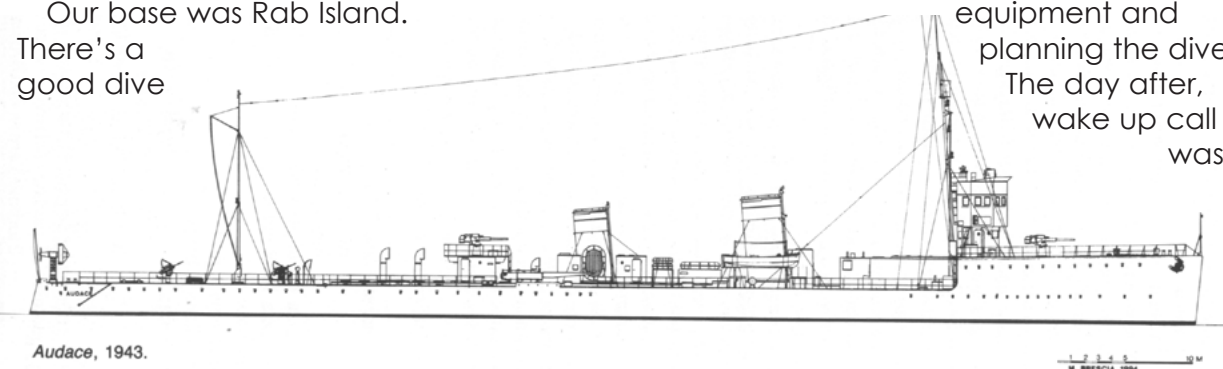
Our base was Rab Island. There's a good dive

center there. We left from Italy with 15 50lt cylinders, helium and oxygen charged, since it's hard get gases on the island. All divers were equipped with 18-liter twin cylinders and three deco bottles. Each diver brought his own equipment.

As a team, we decided to also make our deco station big enough for all divers to use, in case of emergency. It was composed of three bars and four polyform bags, and could accommodate recovery of eight divers simultaneously. Within the set-up, nitrox and oxygen bottles were also placed at 21 and six meters.

On June 28, we arrived in Kompar—a little fishing hamlet on Rab Island. The rest of the day was used to set up the equipment and

planning the dive. The day after, wake up call was



Audace, 1943.



at dawn. We would have only two divers dive with the task of identifying the wreck point, mark it with a buoy and get information about dive conditions such as current, visibility, wreck state, nets, etc.

The boat used for the expedition was very comfortable, and we could set up all our stuff nicely. After a few hours of sailing, we were at the alleged wreck site. The fish finder showed 80m of depth. We dropped a dead weight with the hopes of hitting a ship wreck. Federico and I were the divers on this day.

The current was strong and visibility was less than two meters. The dive mix was a Tx 15/55; deco mixes were Ean 50, O₂ and Tx 20/30 to be used for the ascent

at 57m. We were not lucky. The dead weight landed on the muddy bottom. So, we knotted the reel line to the main string and started to search the site.

After ten minutes, I thought I saw a dark shape. I called Federico who had a large grin which made me realize that he had seen it. The agreement was to lift a yellow buoy if everything on the site was fine, but the conditions were very bad, so I decided not to lift anything. We used the rest of the time to bring the dead

HMS AVON VALE AND HMS WHEATLAND
 Shipyard: Yarrow Shipbuilders Ltd. (Scotstoun, Scotland)
 Kind: Escort destroyer
 Class: Hunt (Kind II)
 Launched: 7 June 1941
 Displacement: 1050 BRT
 Length: 85.3 m
 Crew: 164 men
 Armament: 6 4" AA (3x2)
 4 2pdr AA (1x4)
 2 20mm AA (2x1)
 Speed: 29 knot
 Power: 19000 HP



TOP TO BOTTOM:
102mm cannon
on the bow; One
of the six lateral
20mm cannons;
Diver and propeller
at 80m depth

weight over and tie it to the wreck. I noticed a large cannon of 102mm, so I also made a line from it to the ship's stern. Federico placed some direction markers for our return and the next few dives. Then, we started our ascent.

Before leaving water, we fixed a big buoy at 5m and at the water's surface—a little bottle, hoping that the weather condition would improve in the next few days.

Destroyer TA20

TA means *Torpedoboote Ausland*, which is a foreign destroyer. The initials, TA, were then followed by an identification number to identify the ship. All these



ships were big or small destroyers, or torpedo-boats, captured by Germany during the war and then incorporated



into the Kriesgarine. Most of them came from the Regia Marina captured after the armistice of 8 September 1943 and used in Adriatic Sea.

Audace was renamed TA20 and was used as coverage ship and minelayer. Until the end of 1944, it performed some missions against Yugoslavian partisans

flanked with *Niobe* (ex-Dalmazia) and torpedo boat TA21 *Wildfang* (ex-*Insidioso*) and TA22 (ex-*Giuseppe Missori*). On 26 October 1943, Italian partisans informed the the British commander, Morgan Gilles of Royal Navy, about some German dispatches moving from Zara to Rab Island transporting troops.

On 1 November 1944, two British Hunt class destroyers, *HMS Wheatland* and *HMS Avon Vale*, were patrolling the area off Losjini, when they received information of the enemy presence.

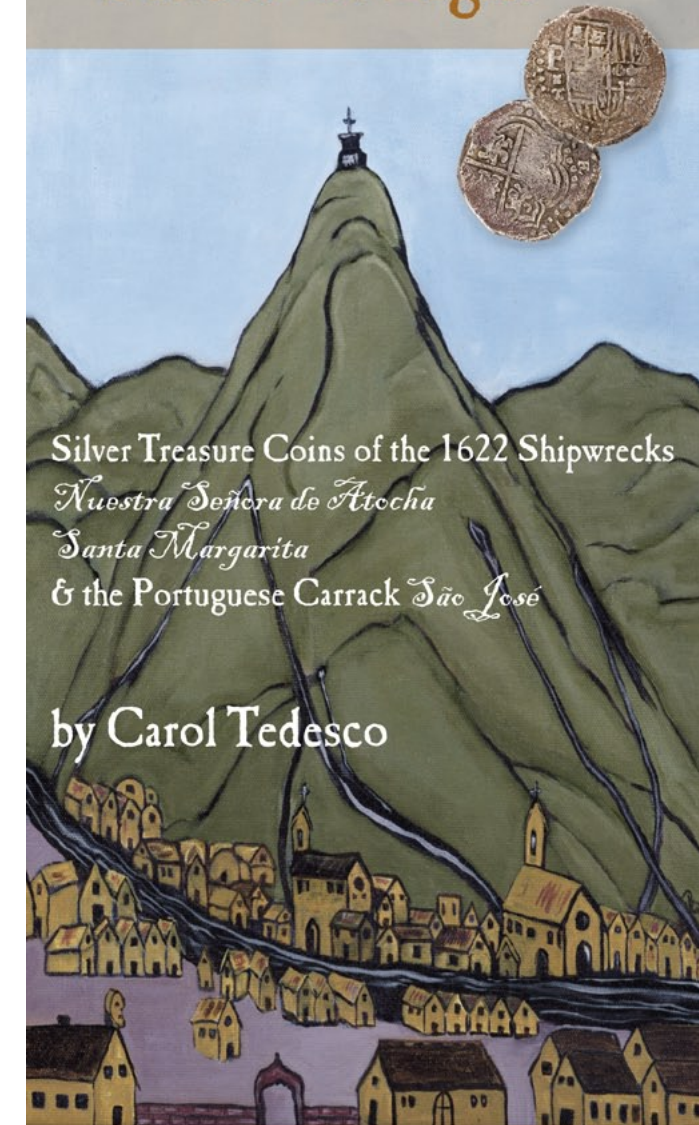
At 19.50, reports came in that two large ships sailing south were the sub-hunters, UJ202 (ex-*Melpomene*) and UJ208 (ex-*Spilgarda*). British destroyers stopped patrolling actions, and instead,

targeted the German convoy. After 20 minutes, German ships were within range, and the British opened fire at a distance of 3,600 meters.

The Germans answered, but in less than ten minutes, were seriously damaged. When the first corvette sank, the *Avon* started to rescue the German

Audace

Pieces of Eight



Silver Treasure Coins of the 1622 Shipwrecks
Nuestra Señera de Atocha
Santa Margarita
& the Portuguese Carrack *São José*

by Carol Tedesco

Fully illustrated with hundreds of finely detailed photographs, *Pieces of Eight* is more than just a reference book. Carol Tedesco not only explains the subtle nuances of the coins themselves, but places them in the context of their moment in history, explaining where they were coming from, where they were going and why.

To be released in 2010 by
SeaStory Press, Key West Florida.
To be on our availability e-mail alert list,
please inquire at lostgalleons@aol.com.



sailors still alive. Suddenly, *TA20* appeared on the battle field and opened fire against the British ship, which quickly returned fire on the Germans.

The *TA20* crew realized their dire situation and decided to retreat, but after only a few minutes of fighting, the German destroyer was seriously damaged and sank.

The last hour of *TA20*

Information on the last hour of *TA20* was provided by Michael Brezze, whose father was on *TA20* as chief engineer.

"At the time of the attack, my father was in engine room, so he could not see what was happening. But he realized that shots hit the main deck first killing all the commanders



TOP TO BOTTOM: Divers on 102mm/45 stern cannon; Divers on the bow; Compass basement of the main deck



Audace

and officers. A second blast hit the engine room and hurt my father seriously."

After the sinking, *Britannic* picked up 71 survivors, and the day after, Germans picked up another 20. The last operation of *TA20* before it sank was an action against a liquor factory in Seberico and Zara.

The dive

On the second day, the conditions and the weather were perfect. The deco station was installed correctly by Luca, Leonardo and Nicola. Massimiliano, Federico and Livio donned their equipment and started the dive. Maurizio and I jumped in after the first group.

At the beginning, the conditions seemed good, the vis was good. But after 40 meters, there was turbid water. Upon arrival on the wreck, I

started filming. I noticed the cannon of 102mm, which was lined the day before, and moved out to the starboard side. There were arms still in position and completely rusted; these were the six 20mm canons, for sure.

Descending to the propeller, visibility was poor—about 5m—and the idea of a free ascent with this bad visibility and the current made me pensive. "With this strong current, the boat will have serious problems to board us," I thought.

I checked my bottom time and signaled my buddy; it was time to go.

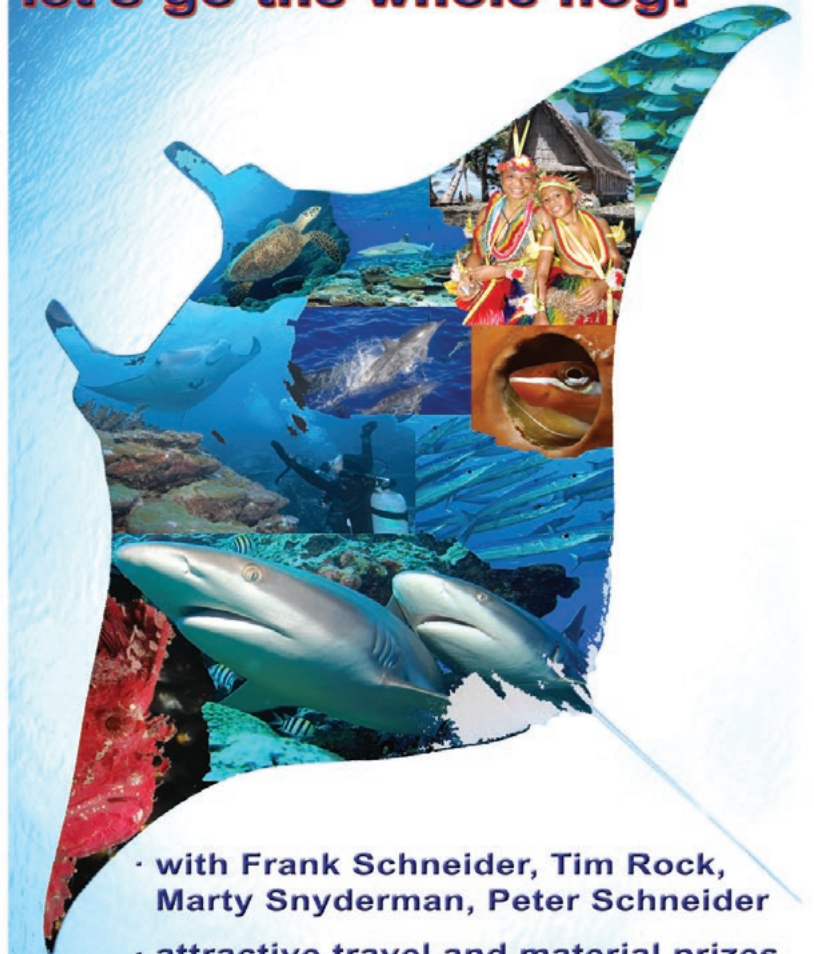
While ascending, I tried to identify and count the lateral arms to confirm our "dry" research. Arriving at the ascent rope, I decided to do a quick exploration of the forward area. There was only one point to go inside. The sub construction on the main deck was fantastic—I could see



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Group photo of Nautica Mare Dive Team



the basement of the compass. Maurizio pointed out to me that time was up; we started ascent. During decompression, we met the other team set to explore the bow area.

At the harbour, the hard job of unloading the boat and refilling the gas tanks was waiting for us. I arrived in my room exhausted but happy to be among the first to document the *Audace* wreck.

The day after ran quickly, and the underwater photographers shot some good images. The night before the last day, I noticed in Livio's video a couple of slides probably used to place mines or depth bombs. We planned the next dive with aim to document this device, which was not mentioned in available books and documents.

The result of the planning was 35 minutes more on the bottom—yes, we were at the limit of safety with the gas supply, but it was necessary to find the ordinances and document them.

My job in this last dive was to find details and evidence helpful to reconstruct the tragic event—the gash which caused the sinking was still not found. I patrolled all around the starboard side of the ship, from bow to stern, but found nothing. Just a little hole was discovered by Leonardo, but it was too small to sink a destroyer like *TA20*. We deduced that the ship was hit on her left side, which now lay on the muddy bottom. Luckily, the other team, led by Massimiliano and

Federico, recognized a shot of the depth bombs, which were almost completely covered on the sea floor.

These bombs were lowered into the sea with the stern slides and a timer which allowed them to explode at the desired depth.

Nicola's team was waiting for me at the ascent line; they were responsible for releasing it. Our connection with the *Audace* was gone. It slipped quickly beneath us—the shape become a shadow and then just an illusion in the blue. This image made me think about all the dead sailors and that, probably, many of them were still in the *Audace*.

Once out, we were glad, aware of the good job done. Neither of us had time to get out of our drysuits before Livio had organized the equipment boxes into a table decked with panbiscotto, soppresata veneta and great bottles of prosecco. ■

SOURCES:

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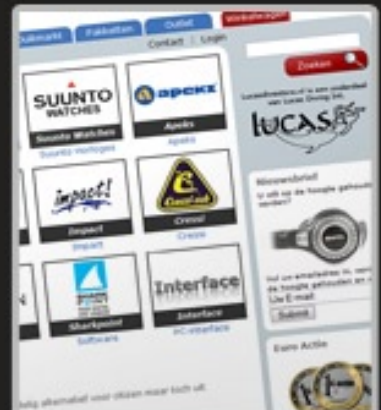
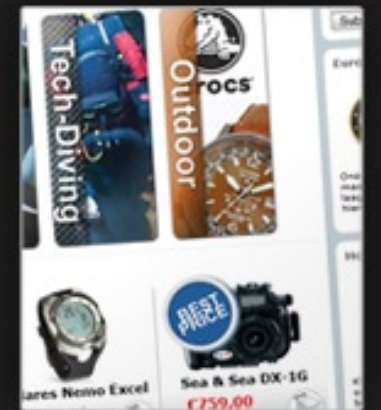
NAUTICA MARE DIVE TEAM
Expedition organizer, Massimiliano Canossa (IANTD Trimix and Wreck Instructor), took part in the project with photographers, Federico Matiello, Nicola Boninsegna and Massimiliano Ragan; video-operators, Leonardo Belloni and Livio Loniti; and safety divers, Maurizio Maiocchi and Luca Preazzolo. Nautica Mare Dive Team (NMDT) is composed of technical divers with a passion for wrecks. The team is head-quartered in Verona and has been working in northeast Italy since 1996. It's also a IANTD Technical Training Facility and instructor training centre, which offers technical courses and cave diving certification. They often organize expeditions to the most important wrecks. For more info, visit: www.nmdt.it ■



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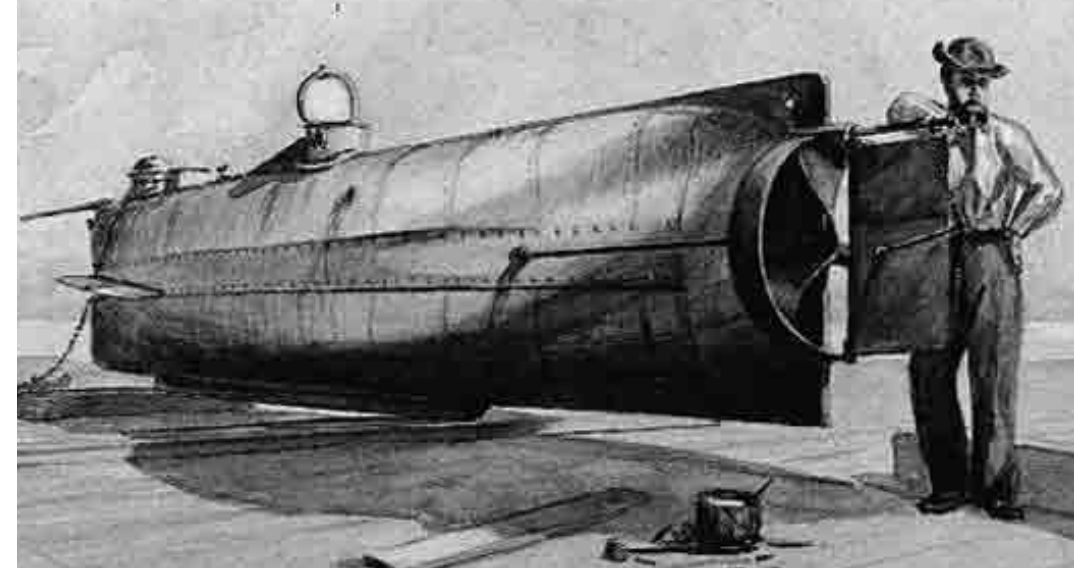


H.L. Hunley is rotated upright—‘stealth-like’ craft now visible

—Confederate submersible was first of its type to sink an enemy ship during warfare.

The Confederate submersible H.L. Hunley has finally been placed into its original upright position in the climate controlled tank at the Warren Lasch Conservation Center in North Charleston, SC. History records the Hunley as the first submersible to sink an enemy ship during warfare. Departing Charleston Harbor late in the evening on February 17, 1864, she stealthily approached the U.S.S. Housatonic, a Union blockade ship preventing ships from entering the harbour. A 135 lb. torpedo attached to a 150' detonation rope was fired into the Housatonic's side, sinking it in less than five minutes. Upon rising to the surface to flash a signal to the crew waiting on shore, the Hunley sank beneath the waves, where she remained for over a century. Before that final voyage, two previous attempts had been made to pilot the Hunley; the first on August 29th, 1863 and the second on October 15th of the same year. Although three men survived the first attempt, all eight were killed in the second, including Horace L. Hunley who had first envisioned the concept of the submersible.

The vessel was discovered in 1995



by Clive Cussler along with the National Underwater and Marine Agency, a private group funded by the adventure writer and marine archaeologist. Since that time, various efforts commenced in order to raise the vessel to the surface and ascertain what happened to the crew. The 39-foot submarine was resting at a 45-degree angle on its starboard side when salvage operations commenced in August 2009. Due to more than 100 years worth of sediment build-up in the interior along with the remains of the eight crewmembers, it was decided that a full examination should be initiated prior to making any attempt to right the seven and one-half ton vessel. Initially held in place by large slings, it took two days to accomplish the craft's shift in position. Moving in micro steps of two millimetres a day, the repositioning was finally accomplished, providing scientists and conservators with the first glimpse of the Hunley's long-hidden hull. With no visible damage in evidence, scientists are continuing their search for the cause of the sinking.

According to Kellen Correia, Executive Director of the Friends of the Hunley organization, "Seeing the Hunley right side up has given us a whole new view of it – it looks stealth-like now. It's hard to realize that over a half million people have come to see the Hunley in the last ten years," she related, "and we

hope that the new positioning will bring even more to our facility." Ms. Correia continued that "within the next two to four weeks, the trusses will be completely removed" from the vessel, although what the ultimate preservation process will be is not known at this time.

When entry was made into the boat upon its raising, the remains of the eight men were found intact, each at his station, in a seated position, with no indication that they had fought to get out or near the opening. It is thought the attack on the Housatonic and its resulting concussive shock wave rendered the Hunley crew unconscious, where they remained as the oxygen was dissipated by their breathing and the lit candle. Another theory is the arrival of a Union vessel coming to aid the Housatonic may have also damaged the vessel. Further examination may reveal the final story, although examination of the crew's remains has given no conclusive results. The little submarine may never sail again, but the contributions of the vessel and its crew will provide scientists and historians with ample food for thought for many years to come.

The Warren Lasch Conservation Center is located at 1250 Supply Street, (old Charleston Navy Base), North Charleston, SC; its number s (843) 743-4865.

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Edited by
Scott Bennett



Flight Seat Guide

A new iTunes application called, Flight Seat Guide, is an application by Christopher Conner that helps air travelers find and select the best airline seats available through various websites such as SeatGuru, Seat Expert, Best Plane Seat and Tagtag.com.

With features such as landscape mode for easy reading, activity indicator display to show pages loading and free updates, users can get quick access to seat information via an iPhone or iPod Touch with Internet connection. Cluttering your desktop is not longer necessary to check travel sites or save multiple links.

Access Seat Guru's tables which compare seats in the fleets of over 100 airlines, rating seats from good to average to bad with color-coding and listing width and pitch as well as in-flight amenities such as loca-

tions of power ports, galley and restrooms. While Seat Expert offers seat information from over 58 airlines around the world with ratings of best and worst, Best Plane Seat offers seat information from 23 airlines listing best rows and seats.

The Flight Seat Guide application also provides quick access to toll free numbers of major airlines through Tagtag.com. Visit: www.quirkphoneproducts.com ■

Grenada to Commemorate the 50th Anniversary of the Sinking of the *Bianca C*

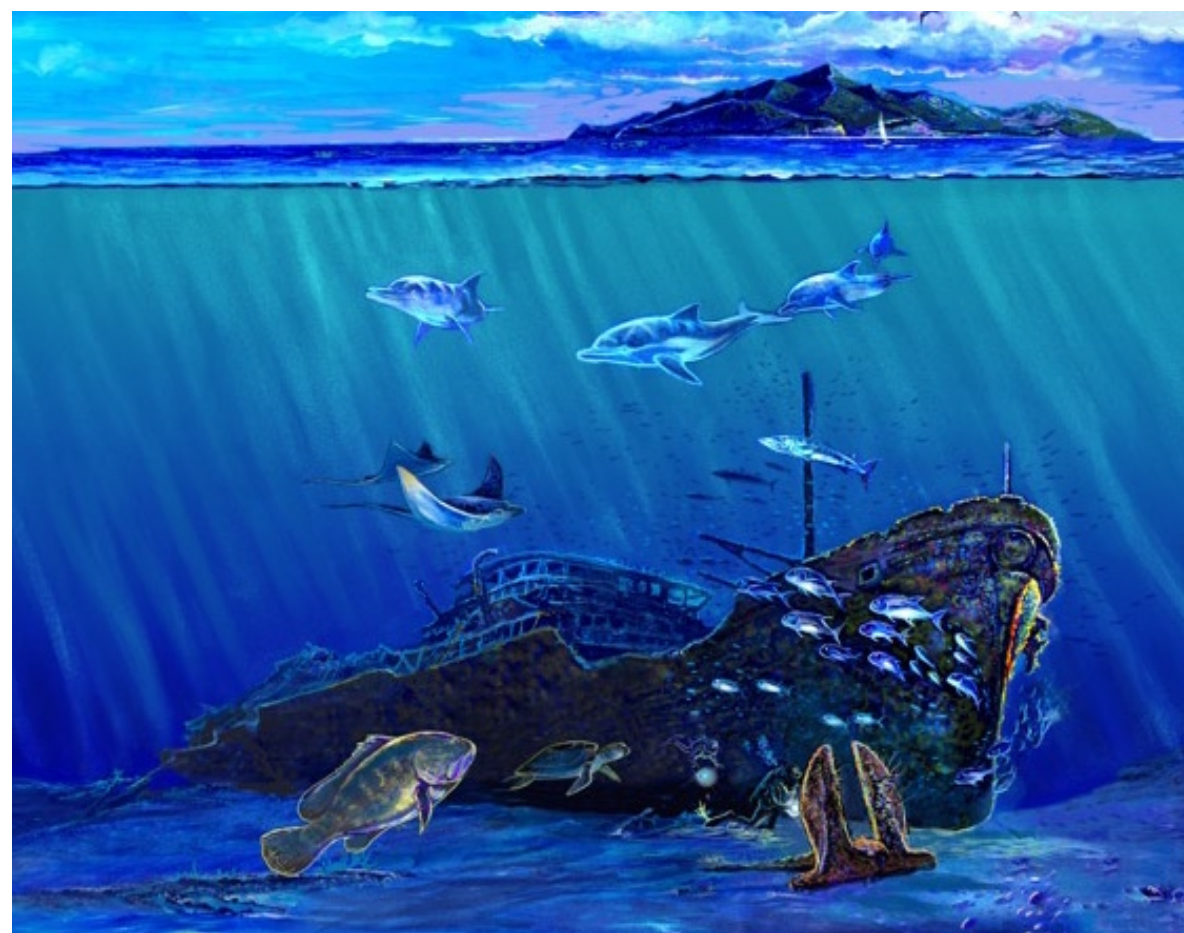
The date, 22 October 2011, will mark the 50th year since the cruise ship *Bianca C* sank in Grenada's waters. Over the years, this sunken treasure has earned the reputation among seasoned divers as the 'Titanic of the Caribbean'. This designation, along with the spectacular marine life that prevails within Grenada's coastal waters, has made this Caribbean island one of the premiere diving destinations in the world.

One of Grenada's most famous dive sites is the *Bianca C*, and it is one of the top-ten wreck sites in the world. The 600-foot-long cruise ship sank near St. George's Harbour on 22 October 1961 and today sits upright on her keel in 165 feet of water. The *Bianca C* is an internationally recognized site for advanced divers who come to explore

the intricate details and swim in one of the site's well-known highlights, the swimming pool on the upper deck.

Grenada and Curaçau have more than 50 dive sites, varying in depths and complexity from 20 feet to 200 feet. Grenada is home to the world's first underwater sculpture park created by Jason de Caires Taylor in Moliniere Bay. Whether you're looking for a tranquil experience or something more adventurous, Grenada has something for all dive and snorkel enthusiasts.

"Diving in Grenada is an unforgettable experience. Our waters are home to many shipwrecks and abundant marine life, including large schools of fish and undisturbed coral," said Simon Stiell, director of tourism for the Grenada Board of Tourism. "We encourage divers



and snorkelers to visit and explore this beauty and history for themselves."

As the 50th anniversary of this event approaches, the Grenada Board of Tourism is planning commemorative activities that will highlight the hospitality that was showcased when the Grenadian people opened their doors to the affected passengers and crew. The weekend will also include the following activities.

Friday October 21

- Presentation of two plaques at the Christ of the Deep statue on the *Carenage*
- The opening of the new *Bianca C* Exhibition at the Grenada National Museum

Saturday October 22

- Laying of the first plaque on *Bianca C*
- Various PADI training courses done simultaneously
- A church service

Sunday October 23

- Laying of the second plaque at the
- Under Water Sculpture Park where a second statue of Christ of the Deep is being unveiled

- An exhibition at Camerhogue Park featuring the latest works of nautical art

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CDWS

The Chamber of Diving and Watersports was founded by Egypt's Ministry of Tourism (MoT) in 2007 with the goal to improve quality, safety and standard of services in the diving and watersports industry, as well as to preserve the unique environment of the Red Sea. CDWS membership is a "must" to obtain MoT license to operate in Egypt and that won't change since it is the law, and all 365 licensed dive centers, 165 safari boats and 80 water sports operations are members in CDWS. If an operation is not a member of CDWS, it is operating illegally. ■

Red Sea diving organization hit hard by financial cutbacks

Text by Arnold Weisz

The Chamber of Diving and Watersports (CDWS) was severely hit by cutbacks in their funding. The Egyptian Ministry of Tourism (MoT) decided to redraw their fund leaving the organization to substantially reduce their staff. This also results in that some of the previous responsibilities of the CDWS, such as quality control, inspections and technical standards are shifted to the Egyptian Ministry of Tourism (MoT).

As of 1 July 2011, the responsibility for inspections are leaning on the MoT, and

the CDWS does not carry out inspections anymore. According to CDWS' managing director, Zeyad M. El Bassel, CDWS has inspected all operations during the past three years, which include all 379 diving centers, 180 safari boats and 80 water sports centers. We asked El Bassel not only about the recent events, but also about serious allegations made against the CDWS:

AW: Due to the recent redraw of Ministry of Tourism (MoT) funds, is the CDWS still operative, and in what capacity?

El Bassel: Yes, CDWS is still operative similar to all the other four tourism chambers in Egypt. CDWS membership is a "must obtain" license to operate a diving, water sport or safari operation in Egypt. Its function is to focus on members' services, marketing and environmental protection. All functions that have to do with quality control, inspections and technical

standards are now to be carried out by the Ministry of Tourism (MoT).

AW: When did the CDWS first inform its members about the financial cutbacks, made by the MoT?

El Bassel: The Ministry decision was a surprising, sudden one. As soon as it was confirmed by the Minister during a meeting with him and his staff, the CDWS sent a circular to all members on 2 July 2011.

AW: What is the reason for the sudden and massive redraw of funds by the MoT?

El Bassel: It is simply due to a change in MoT policy, from depending on CDWS for the technical issues, inspection and quality control to the MoT transferring these activities to itself.

AW: How many CDWS employees have been dismissed?

El Bassel: Our staff members have been reduced from 57, in all three branches, down to 24.

AW: If still in operation, how will CDWS fund the continued operations?

El Bassel: Similar to all other chambers, CDWS will depend on its own resources, which are the membership fees.

CDWS has had an important function in regulation the diving and water sports industry in Egypt. It is now up to the MoT to continue this work, and with the current political situation in the country, it remains to be seen if the government



PETER SYMES

is up to the task. El Bassel explains to us that during the last three years, only 14 operations failed to meet the technical and specification requirements of the Ministry of Tourism out of 379 operations in Egypt. It is also important to elaborate that such operations that failed were inspected more than five to seven times and with Ministry of Tourism inspectors as well as CDWS inspectors. They were also granted many chances over a period of more than a year to comply with the standards and requirements. When it was apparent that they did not comply, the Ministry of Tourism cancelled their licenses, not the CDWS.

Serious legal allegations

During its four year existence, the CDWS also has suffered from alleged corruption and misconduct by some diving and water sports businesses. And there have been attacks on the organization in several Internet forums.

AW: There have been allegations about corruption within the CDWS!

El Bassel: These are the rumors. If there were any corruption cases, they would have been investigated by the authorities or MoT. There has been no such thing at any time. These rumors have been spread by the illegal operations that were hammered heavily by the work of CDWS

during the last three years.

AW: Are you aware of any such activities within the CDWS or by any members of the CDWS board?

El Bassel: No way. There has been no corruption at any time—just many untrue rumors.

AW: Are there any pending court cases against the CDWS?

El Bassel: No. There are seven court cases against MoT, joined with CDWS, by operations that lost their MoT licenses asking to be legally allowed to obtain their licenses back. These court cases are mainly against MoT, since the MoT is the state department that issues and cancels the licenses.

AW: Since there are many rumors going around, why hasn't the CDWS responded with official press releases to avoid such uncertainty?

El Bassel: CDWS is member-focused, and did send them updates by circular emails, but I have to say that official statements are not as appealing as rumors. Unfortunately, these circular emails were not posted on the website, and there is no reason for this, except that it was simply overlooked! ■



PETER SYMES



Bikini Atoll re-opens to Scuba Diving

After a three-year closure, Bikini's world-famous lagoon and its fleet of sunken World War II vessels are now open to scuba divers. Bikini Atoll Divers in conjunction with Indies Trader Marine Adventures has announced the re-opening of Bikini Atoll, named by the United Nations as the Marshall Islands' first World Heritage Site in 2010.

Since the unreliability of the government airline prompted the atoll's closure in 2008, visitors now arrive by Daly's liveaboard vessel, *Windward*, from Kwajalein Atoll Airport. The voyage to Bikini is 215 nautical miles, 65 miles in the sheltered waters in the lee of Kwajalein Atoll and 150 miles of open seas from the northerly point of Kwajalein to Bikini. The open seas leg takes approximately 18 hours and the sheltered leg is seven hours.



Windward

The entire trip takes about 25 hours depending on sea conditions and current. The season runs from mid-May to early November.

For additional information, contact: saratoga@ntamar.net ■

British Foreign Office trials emergency SMS service

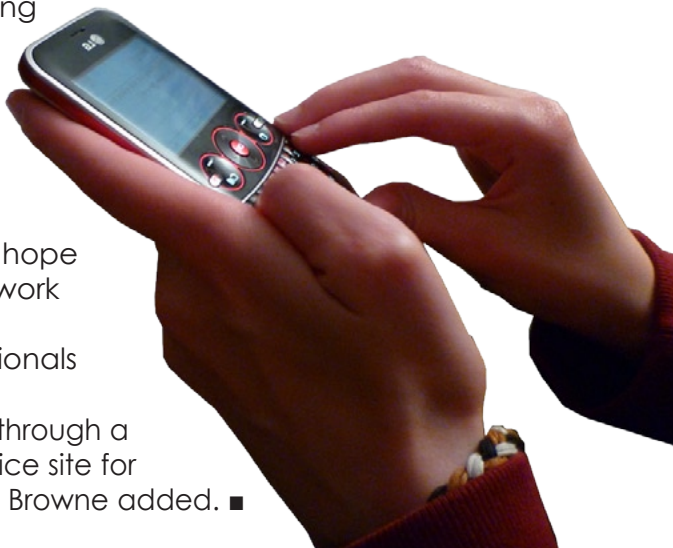
Vodafone teams up with Foreign Office to trial emergency text messaging service for Britons overseas.

The British Foreign Office (FCO) has launched a new trial service delivering emergency text messages to anyone on Vodafone's network when they are abroad. Over a 12-month test period, free texts will be sent to Vodafone's customers in countries experiencing major crises such as natural disasters or civil unrest.

"The recent consular crises in Libya and Japan have demonstrated the need to deliver live travel safety messages to as many people, as quickly as possible," stated Foreign Office Minister Jeremy Browne. "We hope in the future we will be able to roll out this service with other mobile network operators and mobile providers."

The FCO will soon have the ability to send text messages to British Nationals registered on the crisis database.

"As well as this we're also exploring the delivery of important information through a range of mobile and online tools, including smart phone apps, a travel advice site for mobile phones and making effective use of social media and digital tools," Browne added. ■



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Giant grouper waits patiently for its next meal at Manta Reef

On the southeastern seaboard of Africa, along a 200km stretch of the Mozambique coastline, Mother Nature has conspired to create what can only really be described as the perfect underwater biological storm. For it is in this remote area that several major African and Indian Ocean currents converge, producing some unique counter-cyclic eddies that suck up rich nutrients from the deep trenches to the south and create huge quantities of zooplankton, the life source of oceanic mega fauna.



Giant frogfish at Salon (above). The Diversity Scuba dive boat (left) heads down the coast to Krakatoa. PREVIOUS PAGE: Colorful local fishing boats in the warm morning sun atTofo beach in Mozambique



This unique mechanism has been occurring largely unnoticed for thousands of years, and has undoubtedly played a major role in the evolution of two creatures at the tip of the mega fauna food chain—the whale shark and the manta ray.

The area, in the southern Mozambique province of Inhambane, is host to some 20 percent of the world's population of whale sharks and an estimated 1,400 individual manta rays—one of the largest populations of manta rays identified anywhere in the world.

Ironically it was one of the scourges of Africa—tribal warfare, which descended into the protracted and very bloody Mozambique civil war—that kept this unique natural phenomenon hidden from the world.

But times have changed, and peace has returned to Mozambique, but with it has come other threats that are having a significant impact on this unique marine mega fauna aggregation and now threatens its very survival.



Mega fauna aggregations

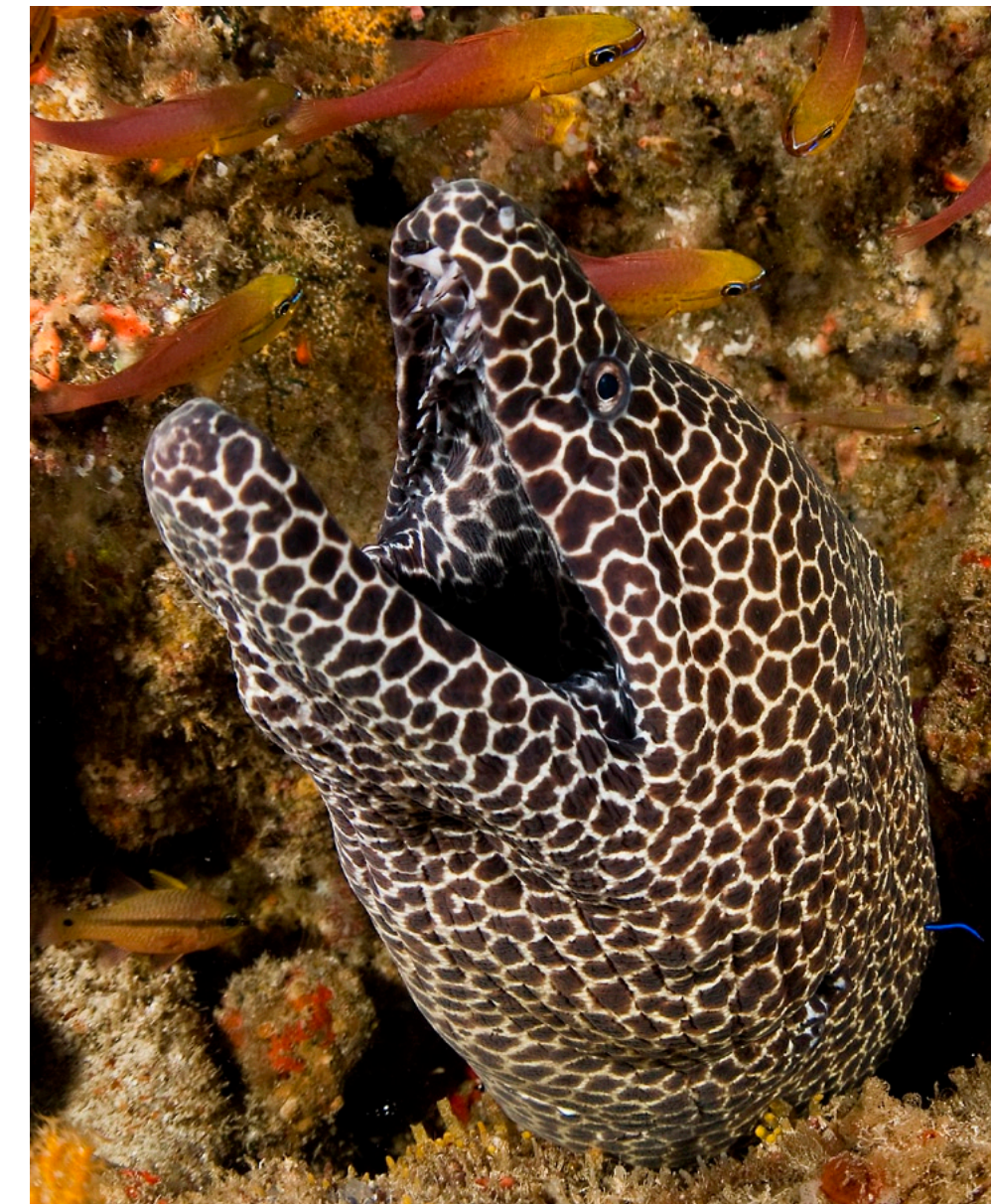
Aggregations of marine creatures happen when a combination of natural circumstances occur and create the ideal conditions for large groups of fish

or mammals to gather at a specific geographical location.

Many, such as South Africa's Sardine Run, South Australia's giant cuttlefish or Tonga's whales are very well known,

CLOCKWISE FROM ABOVE: Small school of Moorish Idols at Arena; Large scorpion fish blends in with reef; Whale shark "banks" as it dives; More schooling fish at Arena—a very rich dive site!





Large bull ray (above) cruises past at Manta Reef; Superbly camouflaged giant frogfish at Galleria (top left); Honeycomb moray eel at Manta Reef (bottom left)

while others are still to be discovered. But they typically all have the common denominator of seasonal influences creating the pre-conditions for the aggregation to occur.

In other words, it happens once or maybe twice a year for a limited time only, and the creatures that aggregate are basically "hard-wired" to make their way to the location, as they sense the pre-conditions developing.

For example, at Ningaloo Reef in northwestern Australia some seven to nine days after the March or April full moon is a massive coral spawning, which attracts large numbers of whale sharks that stay in the area for two to three months to feed on the resultant

zooplankton.

But in southern Mozambique, the unique counter-cyclic eddies produce a rich year-round source of zooplankton concentrated in a 200km stretch of coastline from Zavora in the south to Pomene in the north. The availability of such a rich food source makes the Tofo area an extremely important one to marine mega fauna.

Praia Do Tofo

The small beachside village of Tofo, situated in a picturesque bay about 16 kms from the regional center of Inhambane city, has become the epicenter for the large numbers of tourists

visiting the area to experience first-hand the mega fauna.

Several dive centers have set up shop and numerous guest houses and small hotels have opened to accommodate the influx of tourists, which is all very positive in a poor country desperate for growth. Tofo has also become the base for some ground-breaking research into both manta rays and whale sharks and some quite amazing things are being discovered about these wonderful creatures.

Marine scientists Dr Andrea Marshall and Dr Simon Pierce are leading the research, with Marshall focused on manta rays and Pierce on whale sharks.



Together they have created the Foundation for the Protection of Marine Megafauna (Marinemegafauna.org), which is based at and supported by the Casa Barry Lodge (Casabarry.com) in Tofo.

Every Monday evening in Tofo, Andrea Marshall gives a presentation on her work with manta rays, and on Wednesday's, it is Simon Pierce's turn to talk about his research on whale sharks. Then on Friday nights, PhD student Chris Rohner does an excellent talk about the overall marine life of the Tofo area.

I spent a total of two weeks in Tofo and was lucky enough to arrive over the weekend and caught Andrea's talk on the Monday night. Frankly, I was stunned at what she presented—not only was it factual and interesting, but she also has a great repertoire of one-liners that keep you fully entertained as well as enthralled.

So interesting were all three presentations that I went twice to all of them and became a little concerned that I might



CLOCKWISE FROM TOP LEFT: Large puffer fish at Clown Fish Reef; Cruising leopard shark at Oasis; Divers and giant grouper at Oasis; Scorpion fish blends in at Galleria



Rafael (left), one of Diversity Scuba's Mozambiquan dive masters; Leopard shark at Arena (above); Schooling surgeon fish at Oasis (left); One of the many crocodile fish at Crocodile Rock (below)



Mozambique, besides their overall numbers, are the high percentage of shark bite injuries.

Andrea Marshall's research indicates that about 75 percent of the identified mantas have these injuries, and a closer look at the actual wounds has confirmed that while

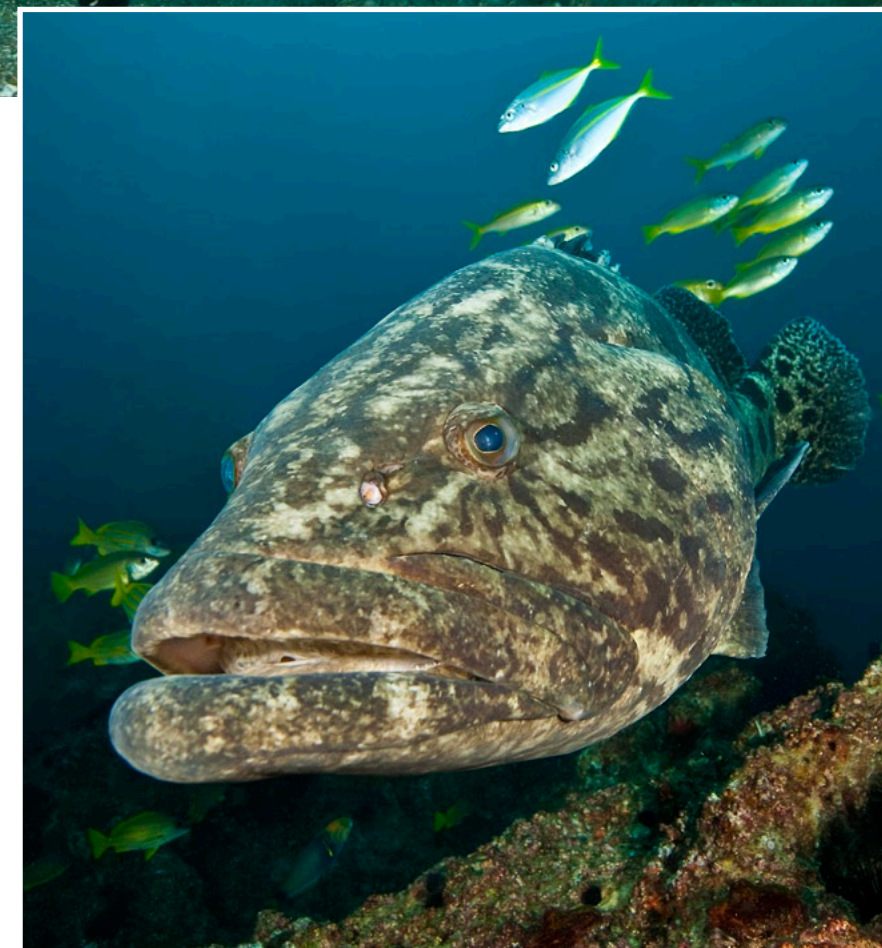
the majority are the result of attacks by tiger and bull sharks, a total of 11 other sharks have been positively identified as the predator.

The attacks appear to be random and opportunistic whereby the shark spots the manta and then attacks from behind in the ray's blind spot and manages a single bite before the startled manta accelerates away towards safety.

It's almost—but not quite—a win-win situation, because the shark is happy to have had a quick snack while the manta is presumably happy to have survived the attack, and because all of it's main organs are concentrated in it's core, such attacks are rarely, if ever, fatal.

Manta cleaning stations

Large marine creatures inevitably suffer from significant numbers of tiny parasites that are extremely difficult



This giant grouper was so close I could tell if it had halitosis

be reported to the local police for stalking.

Tofo, itself, is a small but very pleasant place with a few nice restaurants and bars, but if you go there, plan your trip so you can attend all three presentations—you won't regret it!

Fast food—manta style...

One of the most significant things about the manta rays in



Reef manta ray at one of the cleaning stations at Manta Reef (left); The shark bite wound on this reef manta is clearly visible (below)

Her subsequent research has established that around 80 percent of the manta rays in the area are female and at least 55 percent of the overall population is mature and at breeding age. These statistics, together with the numerous different pregnant females regularly sighted and the constant supply of zooplankton, indicate that Tofo is almost certainly the first recorded manta ray breeding site in the world.

Tofo whale sharks

The biggest fish in the sea are almost a constant fixture

in the Tofo area, drawn as they are by the availability of zooplankton.

A fully grown whale shark can get to almost 20m in length and 34 tons in weight by the time they reach full maturity at about 30 years old, but these leviathans of the sea are rarely if ever seen in the Tofo area. Instead research by Dr Simon Pierce has established that the area is dominated with juveniles in the range from 3-10m.

Pierce, a Kiwi marine biologist who readily admits he had never seen a whale shark before arriving in Tofo in 2005,

has established an equally impressive database to the one on manta rays built up by Marshall.

This data, together with aerial surveys by South Africa's Natal Shark Board has shown that there is a very high concentration of whale sharks in the Tofo area of around three per square kilometer, which means around 70-80 of them at any one time.

Whale shark migration

Whale sharks are solitary oceanic creatures, so for so many of them to gather as they do in the Tofo area

for them to remove, and while breaching is known to be a way of communicating, it is also thought to be a form of shock treatment used to shake them free.

But just as large reef fish and moray eels develop relationships with smaller fish and shrimp—allowing them to feed on their parasites under a temporary truce in the eternal cycle of hunt and eat—so do mantas frequent specific locations, called cleaning stations, where they will hover patiently while cleaner fish perform a similar routine.

Cleaning stations are the perfect place to observe these magnificent creatures as they

linger and allow the parasites to be removed. However, it is unusual for individual mantas to remain around a cleaning station for much more than an hour.

But in the Tofo area, it is quite normal for mantas to remain for several hours at a time, because not only are their parasites being removed, their wounds are being cleaned of dead and infected flesh, thus allowing them to make a full recovery from their attacks.

Interestingly, Marshall has noted that different types of cleaner fish service different parts of the mantas, with sergeant majors cleaning the manta's mouths, cleaner

wrasse doing the honors on the gills and butterfly fish providing the wound management treatment.

Manta crèche?

Marshall arrived in Tofo in 2003, looking for subject matter for her PhD in marine biology, and when she discovered the sheer numbers of manta rays and whale sharks in the area, quickly realized she had found the right spot.

Describing it “like choosing between chocolate and pizza”, she elected to study the mantas and has since built up a visual database of over 700 manta rays.





CLOCKWISE FROM ABOVE: A whale shark feeds on plankton near the surface; Schooling fish at Manta Reef; Another giant grouper at Manta Reef waits patiently for its next meal; Electric ray at Clown Fish Reef

indicates that the region plays a significant role in the growth cycle to full maturity.

Very little is currently known about overall whale shark migration patterns, however, Pierce's data has shown that around 70 percent of the juveniles that visit the Tofo area are never seen again—meaning that they are just passing through and indicating that the Tofo corridor is an important transit and feeding area for whale sharks as they mature.

Conservation

The obvious benefit of having such intensive and regular research in a mega fauna hot spot like Tofo is that over time a clear picture starts to emerge about the overall health and vibrancy of its star attractions.

Unfortunately, there are clear indications of a possible decline in both the whale shark and manta ray populations, but whether this is an actual decrease or just a reduction in their 'sightability' in the usual locations is not clear at this point in time.

Of major concern is the use of long line and net fishing related to satisfying the ever-increasing demand from locally-based Chinese 'businessmen' for shark fins, of which manta rays are basically collateral damage rather than the main game.

Aaron Gekoski with his, *Shiver: A finning crisis* story, documented this very well in issue #41 of *X-RAY MAG*, but on my last day in Tofo, I also witnessed first hand a sickening example.

My two weeks of diving over, I was getting a nitrogen break before the long

flight back to Sydney and was out taking early morning photographs when I saw a tiny local fishing boat returning from its night's work.

Thinking this may provide a scenic

photo opportunity, I positioned myself to catch the boat being pulled up on to the beach by the weary fishermen. Then, I realized that under the nets piled up on

the boat was a barely alive but fully mature mobula ray.

To my horror, the ray was promptly pulled out of the boat and slaughtered in front of me, as I struggled to capture the



scene. Then, I saw that one of the fishermen had a shark fin in a plastic bag and realized that the victim had obviously just been thrown over the side after being parted from its prized appendage.

It was a totally shocking scene to behold and one that was made even worse by the slow realization that similar events had probably taken place every day I had been in Tofo, had I actually looked for them.

The solution?

While it is very easy to self-righteously tell the Tofo fishermen that they should not do such things, the fact is that my stomach was full from a pleasant breakfast at my guesthouse while the fishermen



need to earn money to do the same for themselves and their families. With no other way to do it but take their catch from the sea, the lure of easy money from the Chinese 'businessmen' is understandable.

Marshall and Pierce understand this mechanism very well and are trying to establish a marine park in the critical 200km Tofo corridor that will achieve the dual objectives of protecting the area's mega fauna while allowing the local population to benefit—not

just the hotel and dive shop owners. Easier said than done, but their work over the last six to eight years has

provided essential insight into the most problematic areas, such as the southern village of Ligoga, which has become a manta ray hunting black spot.

An all-encompassing southern Mozambique Marine Park, with no fishing at all is highly unlikely to either get approved or be successful. But if the key locations can be effectively protected it could ensure the survival of the very special mega fauna of the Tofo area. Let's hope they are successful. ■



CLOCKWISE FROM TOP LEFT: Downtown Tofo; Fishermen drag their boat up onto the beach; The mobular ray is butchered on the beach; The fisherman and the freshly taken shark fin; The shark fin and the remains of the mobular ray (inset)



IMAGES THIS PAGE:
Feeding whale shark

Mozambique

entering the personal space of Tofo's mega fauna, a code of conduct has been established by the dive operators in conjunction with Marshall and Pierce.

I was pleasantly surprised to see how well and how sensibly all the staff at Diversity Scuba, who I dived with while in Tofo, implemented this.

Underwater, divers are not allowed to enter what I would call the "comfort zone" of the manta rays at the cleaning stations. Instead, there were designated observation areas where the divers were positioned, and these tactics meant that the mantas were not intimidated by the sudden appearance of a large number of noisy underwater animals.

As often happens with intelligent creatures, the mantas would come and investigate after some time, meaning that the encounters can be just as intimate but very much on their terms.

Similarly, to avoid damaging the critical reef infrastructure, all the guides were very careful to

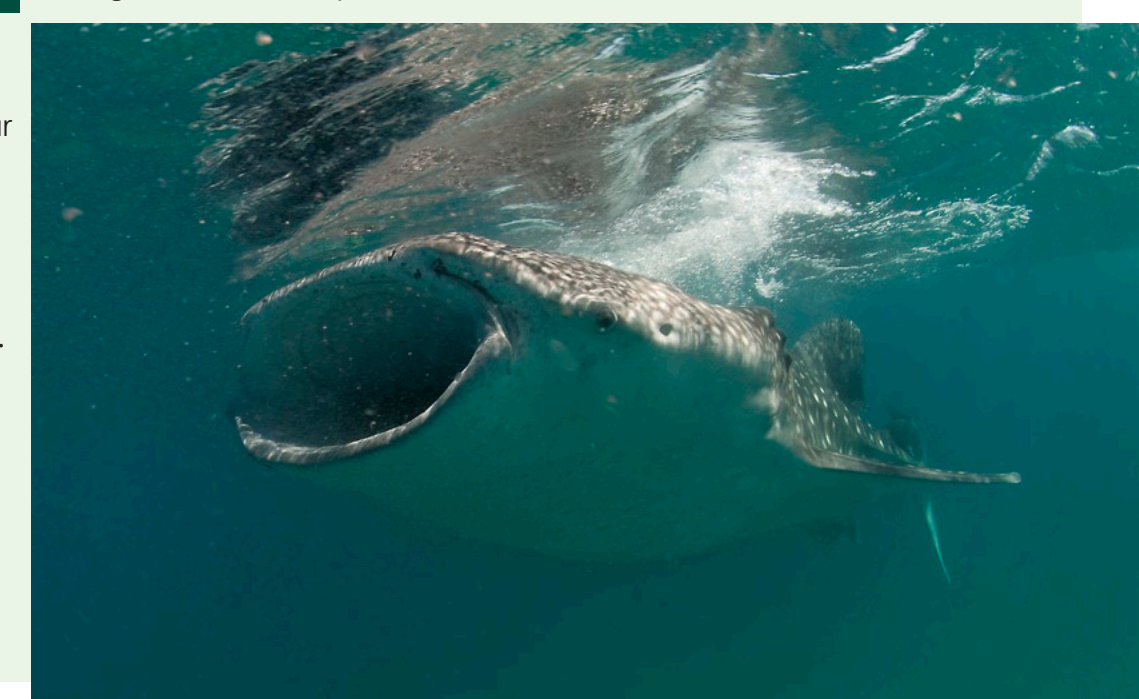
ensure none of the divers kneeled or otherwise damaged any part of the Tofo reefs.

With the whale sharks, all the organized interaction with them is part of a 'safari' whereby parties of snorkelers are taken out on RIB's launched from the beach South African style.

There is a large feeding area just to the south of Tofo, which is rich in zooplankton, and the safari boats cruise the area looking for whale sharks. When one is spotted, great care is taken to ensure that minimal stress is placed on them.

The snorkelers are dropped quietly in the water 20-30m upstream of the whale shark, so that it swims into the waiting party, who have been strictly advised not to try and obstruct the sharks in anyway.

Experience has shown that this produces the best and closest interaction, and any closer interaction forces the shark to 'bank' by turning its back on the potential threat and diving deeper. ■



ABOUT TOFO
Tofo is a pleasant and picturesque place that owes its relative prosperity to the marine mega fauna and the people who come from all over the world to see them.

The 'town center' is a collection of huts and stalls selling t-shirts, beers and various other items and comes alive on a Sunday afternoon when many people come from Inhambane after morning church to sit on the beach and drink the local beer.

By about five in the afternoon there is a distinct street party feel, but by about eight, everybody

has gone, and the empty beer bottles are the only tell-tale sign.

GETTING THERE
The nearest airport to Tofo is the regional center of Inhambane, a 40-minute drive from Tofo.

LAM, the national airline of Mozambique, has regular flights from Johannesburg in South Africa.

Although slightly quixotic, Inhambane is an international airport and the solitary customs and immigration official will grant you a visa on arrival, paid with US\$25.

There was only one ATM in Tofo,

at the supermarket and petrol station on the edge of town, but it only takes Visa cards. There is no bank.

WHERE TO STAY?
There was no major hotel in Tofo when I was there, although major renovations were underway of the rather rundown looking hotel Tofo Mar, which should address that. Most accommodation seems to be in guest houses and lodges, which is what I stayed in and was kindly arranged for me by Christophe Chazot of Terra Profunda (www.terra-profunda.com).

DIVE OPERATORS
There are now several dive operators in town, and all appear to be following the code of conduct.

I dived with Diversity Scuba run by expat Englishman Mark Whaley, and I found them to be very well organized and efficient. I was particularly impressed with how well the local Mozambique dive guides and dive masters have been trained by Whaley and his team.

TOFO CODE OF CONDUCT
To minimize the impact of a relatively large number of tourists

Mozambique's Zavora & Tofo

Jewels of East Africa

Text and photos by Scott Bennett

Mention Africa to most divers and the Red Sea or South Africa usually springs to mind. To many travellers, let alone divers, Mozambique is not exactly high on most people's bucket list. Less than 20 years ago, the very idea of visiting the country would have been regarded as a madman's folly. Upon gaining independence from Portugal in 1975, a nearly two-decade long civil war wreaked havoc upon the once affluent colony, decimating its people, infrastructure and wildlife.

After the cessation of hostilities in 1994, the country was bequeathed with the unenviable tag as the world's poorest by the United Nations. Since that time, it has made remarkable strides towards recovery and is rapidly gaining renown as the rising star of the African diving scene. When an opportunity to visit presented itself, I jumped at the chance. Having visited Africa for the first time two years earlier, I was eager to return and experience a brand-new destination.

"No pain, no gain" is an idiom that certainly applies to air travel these days, especially if you are a diver and photographer. From my home in Toronto, Mozambique proved to be somewhat of a long haul. After breaking up the trip

with a few days in the United Kingdom, it was an 11-hour overnight flight from London to Johannesburg. After going through customs and collecting my bags, I set out for the other end of the massive terminal to connect with my LAM (Mozambique Airlines) flight to Inhambane in Southern Mozambique.

Shortly after takeoff, Johannesburg's urban sprawl gave way to the patchwork green of farm country. Continuing eastward, the landscape became increasingly parched and within an hour, we were over Mozambique.

My first impression was one of space. As far as the eye could see, scrubby

acacia trees punctuated the landscape along with intermittent patches of gleaming sand from dry rivers. Save for the occasional sliver of a dirt road, human habitation had all but vanished. Before long, the Indian Ocean's turquoise expanse appeared on the horizon and the landscape reverted back to a lush

green.

An hour and 20 minutes after takeoff, we landed at Inhambane's diminutive airport. Upon completing the world's most refreshingly simple customs form, the officer attached my visa, my US\$15.00 fee and entered Mozambique. Patiently waiting outside was Jon





Garden of soft corals at Zavora (left); Moray eel. PREVIOUS PAGE: Coast view at Zavora

Wright from Mozdivers. After loading my gear aboard the truck, we made a brief stop in town to pick up one of Jon's dive masters and set out for the drive to Zavora along the nation's sole north to south highway.

Enroute, I was surprised to see long-abandoned railway cars emerging from tangles of vegetation. During the war years, the railroads were sabotaged by the RENAMO (Resistência Nacional Moçambicana), the Mozambican National Resistance. With bridges bombed and tracks torn up, the weathered shells are all that remains of the once vital north-south rail link. Flanking the road was another curious sight: a seemingly endless number of stalls selling peri-peri sauce, Mozambique's ubiquitous fiery condiment.

An hour after leaving Inhambane, a

sign proclaimed the turnoff for Zavora Lodge. Trading the smooth tarmac for an earthen road of burnt sienna, I finally felt like I had arrived in Africa. After a pleasant but bouncy ride passing rural scenes of coconut palms and fields of sugar cane, we arrived at Zavora Lodge, my home for the next six days.

Consisting of a bar and restaurant, beach front houses, bungalows and campsites, the lodge offers a commanding view over Praia de Zavora Bay. Beneath windswept dunes, a vast expanse of empty beach vanished into the distant midday haze. With the exception of a few nearby houses, we seemed to have left civilization far behind.

I also noticed something else was conspicuously absent: a jetty. And for that matter, a boat. I began to

ponder as to how we would venture out to the dive sites. The next morning, I would discover that Mozambique diving would be unlike anything I had experienced before.

After checking in at reception, I headed for my room. Ascending a flight of stairs, the view at the top revealed a sight that was decidedly incongruous with the African beachside setting. The block my room occupied was essentially an elongated log cabin that looked as it had been transported from my native Canada! The room was simple but comfortable, the large bed draped with a frilly cascade of mosquito netting.

Afterwards, I met up with Jon at the bar for a beer. Manica, the local brew, was a name that I seemed genetically unable to articulate,



Zavora sunrise (above); Three views of Zavora Lodge (left and right)

mangling its pronunciation daily, much to the bewilderment of the barman.

Established as a fishing lodge in the 1950's, Zavora was a favourite destination among South African anglers during the colonial days. With the country a tourism no-man's land during the war years, the lodge was abandoned. Re-opening a decade ago, the lodge is now run by South Africans Charles and Carol Maker and the fishermen have returned in droves. Zavora is a relative newcomer on country's diving scene, with the dive shop open having been open for only two years. With Mozdivers the only game in town, we would have all the sites to ourselves!

After a tasty dinner of a chicken wrap and chips, I hurried back to the room to

assemble my camera gear for the next morning's dive. With the generator set to shut down at 10:00pm, I managed to get everything finished in the nick of time. Safely ensconced within my mosquito-netted bed, I was lulled to sleep by the crashing surf below.

Diving

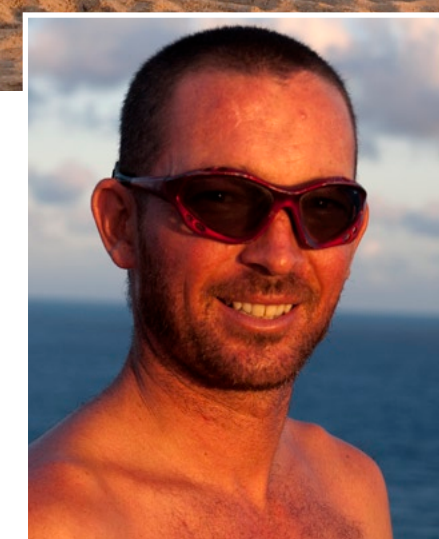
As the day's first dive wasn't until 9:30, I had

a nice leisurely start, just the ticket after my grueling trip. Arriving at the dive shop, I started to assemble my gear and suit up. As the dives would be deep, Jon suggested we use nitrox to maximize our bottom time. It was then I noticed the inflatable boat parked alongside the shop's open wall. Brandishing a pair of twin outboard engines, the *rubberduck* is the mainstay of the Southern African diving scene.





CLOCKWISE FROM LEFT: Fishing boats on the beach at Zavora; Fishermen preparing for the day's outing; Portraits of Manuel, Yara and Jon



With no protective bays along the coastline, the perpetually crashing surf made erecting a jetty



impossible. Able to take a beating in the rough conditions, the rubberduck was the only pragmatic solution. I would soon discover the entry procedure would almost be as entertaining as the dives themselves.

The vessel was perched atop a trailer attached to a well-used tractor.

Once the gear was loaded, the tractor rumbled down the sandy incline to the beach below. In the meantime, Jon gave us a quick rundown of the day's diving.

Deep Reef South

First up was Deep Reef South, situated approximately 10km offshore.

Running parallel to the coast, Zavora's "deep reef" system features multiple dive sites with depths varying between 24 to 45 metres. Our entry point was approximately 500m further down the beach, where a section exposed of reef provides shelter from the crashing surf.



Vino; and dive master, Manuel. I later discovered Manuel to be something of a celebrity; he was the first-ever certified Mozambican tech diver.

Shortly afterwards, the tractor re-appeared and was hooked up to a two-wheeled wagon. "Hop aboard!" enthused Jon, and everyone piled on. Clumped together on a dark metal

As I was the day's only diving guest, it was going to be an employee trip and something of a mini United Nations. Along with Jon and myself, was Brazilian Yara Tibirice, director of the Zavora Marine Lab and nudibranch enthusiast; Pete Berney, her intern from the United Kingdom;

wagon wearing black wetsuits proved decidedly tasty! Bumping along, we passed an assembly of fishing boats parked along the beach before reaching the entry point.

Jon often drives the tractor himself. I could just envision Mozdivers' help wanted ad: Experienced dive master required with technical training—tractor operation skills an asset.

Those expecting lavish pampering are in for a bit of a surprise, as Mozambique diving is very much a hands-on operation with guests doing their part to assist with the launch.

Getting the boat in the water proved to be an unequivocally tricky operation. The tractor has to back up at just the right speed so the trailer halts right at the water's edge and the boat can slide off into the surf. If the trailer stops too close to the surf, the wheels can be easily be mired in the wet sand. As an added hazard, the beach was a bit of a minefield, with scores of bluebottle

jellyfish washed ashore by the incoming tide. Not something one would care to trod on.

Happily, our skilled driver triumphed on the first try. Everyone rushed to turn the boat around so the bow faced the ocean, pushing it forward so it didn't get bogged down in the sand. Once positioned, everyone clambered aboard, and we set out.

After 20 bumpy minutes, I asked Jon how much further we had to go. "We're halfway there," he responded cheerfully. Seeing my crestfallen expression, he laughed. "We're here!"

Part of an offshore chain of reefs, Deep Reef South features a large plateau at 27m with an east-west running wall descending to a sandy bottom at 32m. With the coastline 10km away, I marveled as to how it was discovered in the first place. According to Jon, local fishermen have long known of its existence as a prime fishing spot. With no discernible landmarks as a guide, the



CLOCKWISE FROM FAR LEFT: Snapper school; Bigeye school; Jon and potato bass; Starfish

Mozambique

soft corals, joined by aptly named sailfin rubberlips, Diana's hogfish, bigeyes, blue-banded snapper and massive potato groupers. At one point, I nearly blundered into metre-long honeycomb moray leisurely undulating between outcrops of coral. A school of barracuda even made an appearance, making this one of the most action-packed dives I've ever been on. The entire site

looked so untouched it felt like we were the first to discover it.

I also learned a vital lesson about Zavora: never turn off your camera and strobes, even when in blue water. While ascending to the safety stop, a hefty potato bass cruised in for a look, soon followed by a school of very peculiar fish. At first, it appeared to be a school of silvery flounders undulating through the water column. As they passed beneath us, I realized they weren't flounders at all, but a type of fish swimming on their sides.

Later on, Jon informed me they were carpet trevally, a species with no

start. Moments after plunging in, Yara quickly resurfaced and exclaimed, "I just saw a marlin!" Being the last one in, I quickly descended to catch up with the others. Seconds later, I was engulfed by a shimmering horde of big-eye trevally, presenting a classical photo dilemma:

Should I stop to take pictures or keep going? Not relishing the prospect of being left behind, I fired off a few images and caught up with the group.

Arriving at the bottom, we surprised a leopard shark, which abruptly departed for quieter surroundings. Only the second one I've ever seen, it was already too far away before I could snap a photo.

Although the reef top was somewhat featureless, the drop-off was another story. Subtropical thistle soft corals exploded in dazzling hues of lavender, yellow, white, orange, adorning the wall to the sandy bottom at 32 metres. Fan corals were conspicuously absent, save for a few small specimens designated to a few rocky outcrops on the sand. Although the coral was extraordinary, it was the fish life that really impressed: Deep Reef could easily be renamed "Big Fish Central! For the ensuing half hour, my camera went into overdrive.

Unfamiliar subtropical species rubbed shoulders with such familiar tropical characters as emperor angelfish and common lionfish. Swarms of basslets, locally called goldies, swarmed amongst the



only way to find it is via GPS. In order to protect the reef, no mooring lines had been established. As a result, Jon utilized a towline with a float attached to the top in order for the boat crew to monitor our progress.

Far below, the reef was easily discernible in the clear blue water. "Twenty-five metre vis!" exclaimed Jon. That, combined with the already relentless heat, was the cue everyone needed, and we were all geared up and ready in record time. The dive certainly had an auspicious



Mozambique

CLOCKWISE FROM LFET: Blotched fantail ray; School of glassfish; Mating Spanish dancers; School of carpet trevally

Vasco's boasts a trio of cleaning stations: one at the drop (15m), another 40m inshore (16m) and a third 70m (12m) to the north. All are a favourite manta haunt, so we hoped for an encounter. Mozambique is home to two different manta species, including the newly identified giant manta. In fact, the research identifying this separate species was carried

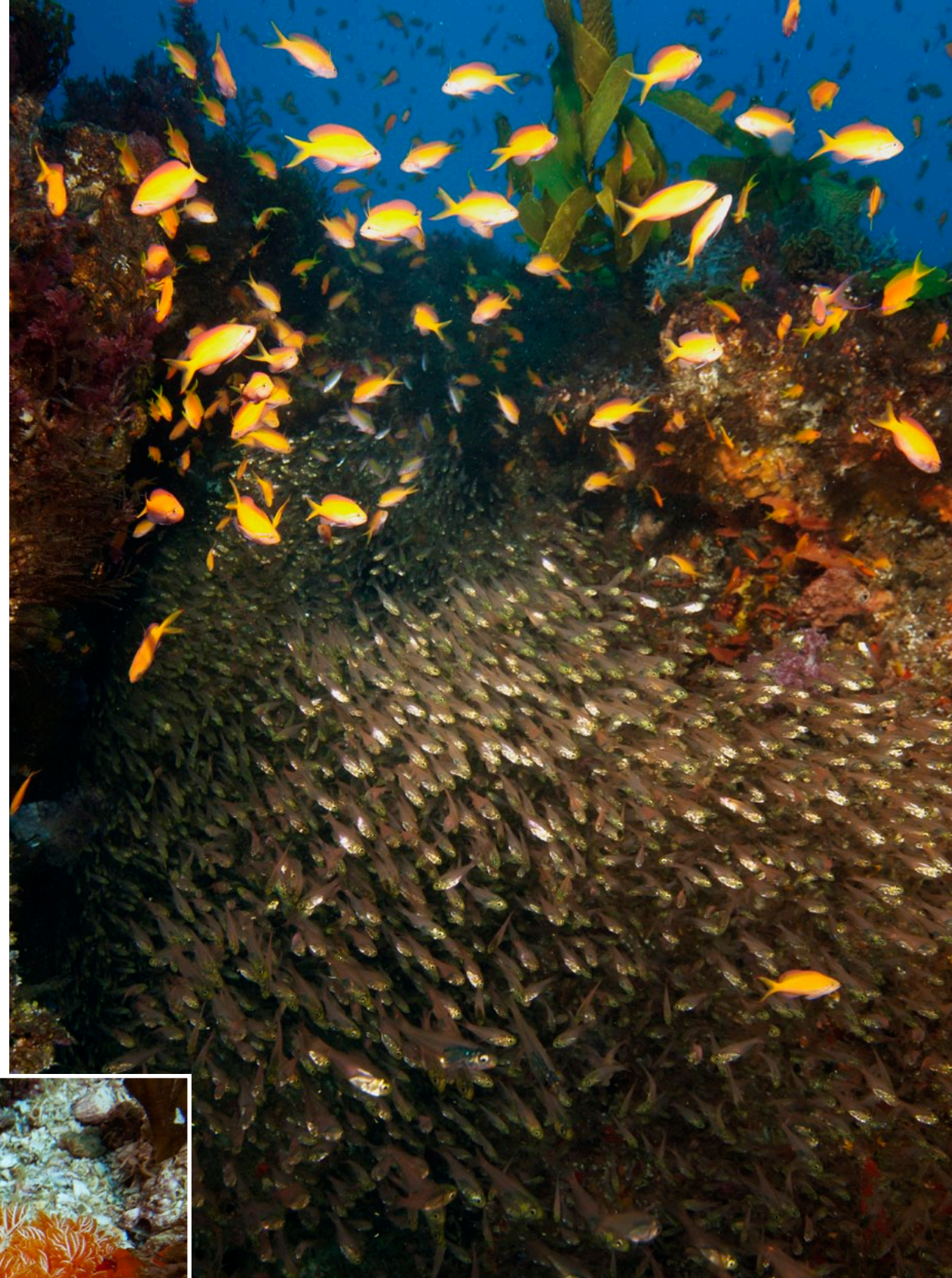
common name. Back at the surface and still buzzing, I turned to Jon. "Oh my GOD!" I exclaimed. "What an amazing dive. That honeycomb moray was the biggest I have ever seen!" Jon grinned. "Everything is bigger in Africa!"

out in nearby Tofo by renowned manta researcher Dr Andrea Marshall.

Alas, today wasn't that day, as the mantas had been absent for nearly a month. Jon theorized they had sought refuge in the cooler waters of the deeper reefs to escape the warm water temperatures. I was beginning to think my trip might prove to be one

Vasco's

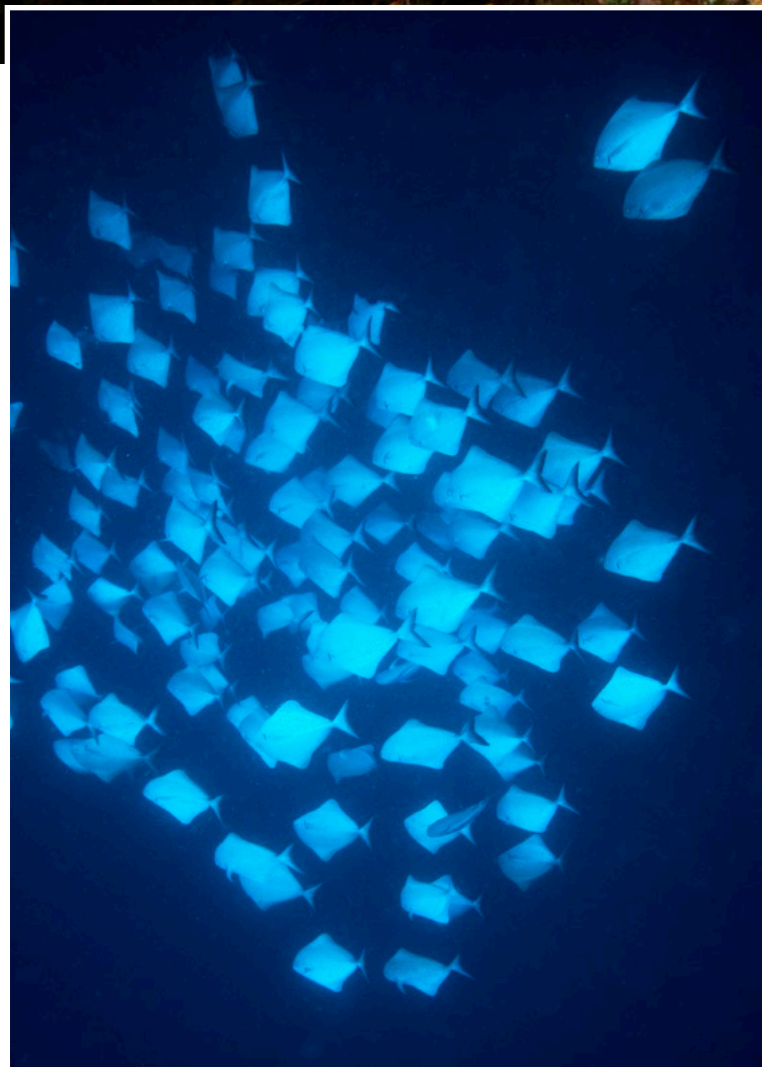
Eager for more, our next destination was Vasco's, two 2km offshore and a 30-minute ride away. Much shallower than Deep Reef and half the distance from shore, Vasco's gets its name from metre and a half long anchor deeply embedded into the reef. Rumour has it that it dates from the time of Vasco de Gama, who passed through the area in the late 15th century.



of those "great moments in bad timing" scenarios.

Despite the absence of mantas, there was no shortage of ray action. Partially obscured by a rocky over-

hang, a massive blotched fantail ray sat immobile on a coral-encircled patch of sand. Easily two metres across, it was the biggest ray I had ever seen. By dive's end, we spotted four more, along with a spotted eagle ray and a pair of Jenkins whiptail rays. Add some whitetip sharks along with snappers, nudibranchs and a shimmering





school of glassfish interspersed with copper sweepers and it all added up to an action-packed 55 minutes!

My memory card bursting, we headed for home and the moment I had been dreading all morning: The beaching. "Hang on!" Jon exclaimed as he opened both engines to full throttle and raced towards shore. Not knowing what to expect, I twisted my body perpendicular to the boat, grabbed a rope with my right hand and the metal pole above the tanks with the left. BIG mistake! Upon hitting the beach, the duck ground to a halt. I, however, kept going. Propelled forward, I flipped over, landing

on my back wedged between the tanks and the side of the boat as everyone gawped with a mixture of shock and amusement. Fortunately, the only thing hurt was pride, and I couldn't stop laughing.

Back at the resort, I quickly discovered I got a lot more than the 100-plus images on my flash card. In the rush to get ready, I forgot one very significant item: sun block. The African sun proved merciless, and by our mid-afternoon return, my hands and face resembled a freshly boiled lobster!

The remainder of the week consisted of an identical pattern, with morning dives on the outer reef followed by afternoon dives inshore. As a result of the prodigious fish life, my wide-angle lens remained firmly affixed to the camera. Each morning, we visited a different site within

the deep reef system including Dean's Drop, Arcadia and Yogi's Den. Each bore similar characteristics, with coral shrouded walls and a spectacular array of large creatures. The mantas, however, remained maddeningly elusive.

Several dives at Vasco's revealed a wide range of creatures both big and small, from mating Spanish dancers, morays and octopus to green and loggerhead turtles, whitetip sharks, rays and potato groupers. On one dive, the water was literally pulsating with legions of jellyfish. Fortunately, they were on the non-stinging variety.



Area 51
A pair of dives at nearby Area 51 proved equally prolific. At 1.2km in length and named after the American UFO hotspot,

CLOCKWISE FROM ABOVE: Green turtle resting on the reef; Potato bass; Zavora reef scene; Jellyfish



CLOCKWISE FROM LEFT: Diver and reef off Zavora; Quadricolour chromodoris pair; Manta; Purple-edged ceratosoma; Guitar shark resting on sea floor

it boasts flying saucers of a different kind. A shallow 6m cleaning station is a favourite haunt of mantas, which have been known to circle the flat-topped pinnacle in formation while waiting for a space to be cleaned. In theory, anyways as there were still none to be seen. They had been around, however.

On one dive, Jon plucked something from the bottom and finned over to show me. At first, I didn't understand the greyish chunk's identity but through a combination of creative mime coupled with Jon's mirthful expression, I quickly realized

remotely close. Some rapid-fire tank banging by Jon caught my attention. Ahead, on the periphery of vision, I could barely discern a colossal silhouette before it vanished in the gloom. Back on the surface, Jon informed me this was a hulking three-meter-long brindle bass.

After the tantalizing glimpse at Area 51, we

what it was: manta pool!

Descending to a vast sandy area at 20m, we were treated to a rare sight—a two-meter guitar shark. An undersea oddball looking like a curious amalgamation of shark and ray, it was extremely shy and bolted before we could get

were rewarded with a fantastic guitar shark encounter the next day at Deep Reef South. Unlike the previous skittish individual, this specimen proved quite tolerant, holding its ground as it rested on the sand at 32m. Five of us settled on the sandy bottom, camera shutters firing furiously. Once the others moved

off, I decided to move closer. Scarcely believing my luck, I inched forward until the creature's pointy snout was brushing my domeport! After a few more shots, it had enough and languidly swam off, settling down a few metres away.

That wasn't the only surprise Deep Reef had to offer. While swimming into a distinctly chilly thermocline at 28m, Manuel gestured excitedly ahead. Out of the gloom, a distinctive pair of silhouettes were heading our way. Mantas! Scarcely able to believe my eyes, the graceful giants came to within metres of our euphoric group. Literally poetry in motion, they swam alongside us for ten spellbinding minutes. Although they weren't the giant species, a manta is still a manta and my drought had finally been broken.





Sponge City

After a week of shooting wide angle, I was eager for some macro and Jon had just the place. Only a few kilometres from shore, Sponge City was Yara's favourite nudibranch location. Entering the water, it didn't take her long to find some photo subjects. A large flat area at around 16m was

home to abundant purple-lined nembrothas, one of which was in the process of consuming an ascidian. Nearby, a purple-edged ceratosoma added a vivid splash of colour to the drab undersea vegetation.

I soon happened across the site's distinguishing feature—a large cleft in the seabed wide enough for a diver to swim



Mozambique

through. Descending to 20m, I finned through the narrow opening, careful not to damage any of the corals lining the wall. A crevice revealed a pair of quadricolour chromodoris nudibranchs. However, getting a shot proved to be the undersea equivalent of playing Twister.

Standing on the sandy bottom with less than half a metre on either side, I attempted to get some images, which quickly proved easier said than done.

Totally engrossed with my photography, I heard beeping, which I assumed to be the conservative computer of one of the other divers. After shooting a while longer, I glanced at my computer and my eyes bulged. That had been my own computer and I was now into deco. Make that a LOT into deco! The nudibranchs were quickly abandoned as I ascended



CLOCKWISE FROM FAR LEFT: Purple-lined nembrotha; Geometric moray eel; Reef scene at Zavora; Coral trout



for my safety stop, which ended up being 15 minutes (my new all-time record).

As I sheepishly explained my predicament to Yara via hand

signals and perplexed expressions, I could discern her laughing into her regulator. With ample time to spare, I kept myself amused by photographing the endless parade of jellyfish swimming past. Back on the boat, I sheep-



Great Wall South

On my last dive at Zavora, Murphy's Law made an unwanted appearance. For our inshore dive, Jon had decided on Great Wall South. With my laptop crammed with wide-angle images, I switched to macro. Minutes into the dive, I was scouring the wall for macro subjects. I had just happened upon a scorpionfish when a frenetic bout of tank banging heralded the arrival of something significant. Whirling around, my stomach sank. Cruising right in my direction was a leopard shark. Photographically helpless with my macro lens, it cruised by at arm's length. Curses!

Tofo

After a superlative week, it was time to bid adieu to Zavora and move on to my next destination. Situated on the Ponto do Barra peninsula 22km from Inhambane, the small town of Praia do Tofo—or simply Tofo—has emerged as one of Mozambique's premier tourist destinations. Boasting an imposing sweep of Indian Ocean beachfront, Tofo (pronounced *tofu*) is home to a broad array of beach villas, restaurants, Internet cafes and dive centres. Compared to the wilds of Zavora, it might as well have been Waikiki Beach.

Arriving late in the afternoon, Tofo Scuba was a bit of a shock after my week in the wilderness. Established a decade ago, it is a large operation with an extensive staff, most of them South African. My accommodation was right next door at the Aquatico's Beachside Casitas. The roomy interior featured a kitchenette and, best of all, 24-hour electricity and multiple plugs. For dinner, I ambled over to Dino's Beach Bar, a Tofo icon complete with internet café. With an expansive



CLOCKWISE FROM FAR LEFT: Barracuda school; Blue-spotted stingray; Bigeye trevally; Surgeonfish

Mozambique

patio boasting great views of the beach, I tucked into a flatbread-style pizza watching the warm hues of late afternoon meld into dusk.

The next morning, I walked the few scant metres to the dive shop for breakfast. I met up with owners, John and Nikki Pears, who had just arrived from South Africa. Over coffee, John gave me a bit of info on the area

and its most famous undesea residents—the whale sharks. Research by Dr Simon Pierce of the Foundation for the Protection of Megafauna has revealed that Tofo has "the largest number of reported year round whale shark sightings in the world".

Just to the south of Tofo's bay, an offshore area approximately one half-mile wide and four miles long, is



ishly apologized to everyone and vowed it wouldn't happen again (on this trip, anyway).

On my last evening, Jon drove up to the lighthouse on a nearby hill. Although he said the keeper might not let us in, Jon was armed with a secret weapon—a couple of cold Manicas. The lighthouse keeper's stern countenance quickly melted into a smile and he opened the locked door. We ascended the winding staircase to the top, which offered commanding views of the entire area.

Mozambique

grouper approached anticipating a handout. The fish were extraordinarily tame and had obviously been fed in the past. Although fish feeding has long been discouraged, it sure doesn't stop them from trying! A massive outcrop riddled with numerous outcrops and spires of rock, Hogwarts lived up to its namesake. Green tree corals sprouted from the walls while goldies swarmed in abundance along with semicircle angelfish, longnose butterflyfish, blue-banded snappers and white-barred rubberlips.

Chamber of Secrets

Situated smack dab in Whale Shark Alley, our next stop was The Chamber of Secrets. Boasting numerous swim-throughs and caves, the horseshoe-shaped formation featured walls ascending 6-8m from the sandy bottom. Unfortunately, surface conditions created an underwater maelstrom of sediment, wreaking havoc on the visibility.

As photography would be virtually impossible, I decided to just enjoy the dive. Lots of interesting sponges adorned the wall, while rocky overhangs harboured aggregations nudibranchs, red and white striped giant squirrelfish and red soldierfish. A large porcupinefish peeked from a crevice while a sandy patch below housed a well-camouflaged crocodilefish.

Enroute to Tofo, we kept an eye out for whale sharks, but it was too rough to snorkel even if we saw one. At the dive centre, the news was ominous. Conditions were expected to deteriorate over the next few days and diving prospects looked grim. The culprit was a cyclone over Madagascar. Although not heading in our immediate direction, it was already affecting surface conditions over an enormous swathe of coastline.

Giant's Garden

With conditions deteriorating, John wanted to get me out for one last dive at nearby Giant's Garden. The

Whale Shark Alley—a prime aggregation area. As they are often encountered travelling to and from the dive sites, stops are often made to snorkel with these gentle giants. Just to be safe, I fitted a second housing fitted with a domeport. Bring on the whale sharks!

Hogwarts

My first day at Tofo proved to be Harry Potter day. First up was Hogwarts—a 30-minute boat ride from the dive shop. Having mastered Zavora entry procedures in, I assumed Tofo would be no different. Wrong! Surface conditions had worsened overnight, making Zavora's sur-

face chop seem like a millpond by comparison. Also, due to a lack of shelter, the boat had to be put in right on the crashing surf. Dive guides, Darren and Damien, ensured everything ran smoothly and everyone got on board without incident.

A quidditch broom would have been a preferable mode of transport, as the ride

turned out to be pretty rough. Massive waves lashed the headland, making me grateful the site was a reasonable distance offshore. As in Zavora, locating the site was achieved via GPS. After several passes, the boatman moved into position and everyone entered the water.

Soon afterwards, a pair of hefty potato



day before, five mantas had been spotted there, so my fingers were crossed. With Darren and Damien as my able guides, we ventured into the surf. "This isn't so bad," I thought to myself. Moments later, my newfound optimism was quashed, as a particularly large wave sent me temporarily airborne. Fortunately, I had been tightly grasping the rope and stayed on board.

Continuously buffeted by big waves, steadying the boat proved to be a challenge, but we did a backward roll and quickly descended. In addition to visibility hampered by the conditions above, there was also some current to contend with. Their polyps extended, green tree corals scooped passing nutrients while Damien pointed out a pair of slipper lobsters hiding at the bottom of a barrel sponge.

Arriving at our destination at around 20m, we waited for the star attraction. Peering into the gloom, I barely discerned a pair of mantas cruising off the wall, but was too far away for photographs. Unfortunately, our bottom time elapsed far too quickly, and

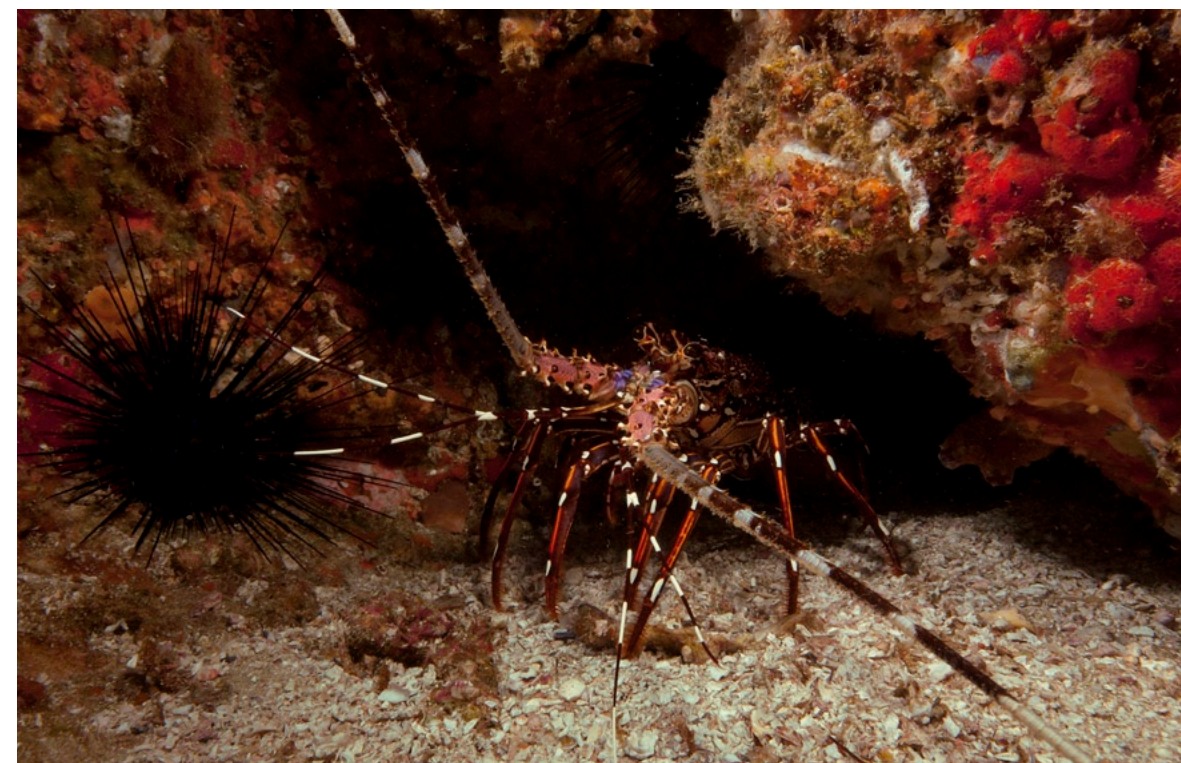
we had to ascend with no further sightings.

All was not lost, however. A large cleft in a rock face revealed a robust lobster. Boldly regarding me with beady eyes, I was able to get close enough so its twitching antennae grazed my domeport. Another free-swimming honeycomb moray obligingly posed for some photos, while a school of big-eye trevalley made several close passes. It was at that point I realized my strobes were only firing intermittently. Fortunately, some strategic cord jiggling ensured I was able to get some images. Such are the joys of water and electronics.



The dive had one more surprise in store. As we hovered in our safety stop, a devil ray appeared from the gloom, making several curious passes around our elated group. Then without warning, it rocketed to the depths below with an incredible burst of speed. My ray tally was now up to six species—a record for one trip.

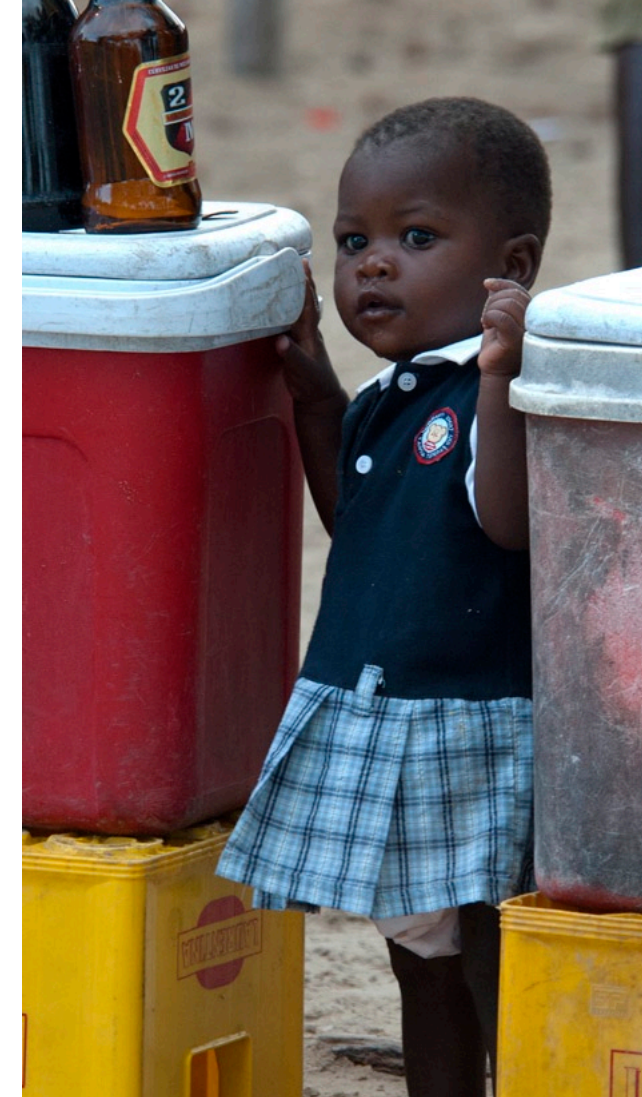
With the day's diving scuttled, I had a bite to eat at the dive centre's restaurant. While waiting for my food, I met Ritchie Van Wyck,



a young and extremely talented South African videographer based in Tofo. We watched some of his work

in the dive centre office, and it was extraordinary. Along with whale sharks and mantas, it included footage of

CLOCKWISE FROM ABOVE: Reef at Hogwart's; Devil ray; Lobster and sea urchin on reef; Honeycomb moray eel



Guest house at Tofo Lodge (above); Tofo Scuba (left) overlooks the sea; Scenes from the marketplace; Smells of barbecue chicken and hotdogs (far right) drift through the air of the marketplace



a small-eyed sting-ray, which, at 3m, is the world's biggest. Watching all the wonders on screen and not being able to dive bordered on cruelty!

Later in the afternoon, I wandered over to the photogenic local market, situated across the road from the beach. A perpetual hive of activity, vendors tempted passers by with a wide array of colourful batik clothing along with t-shirts, woven baskets and various bric-a-brac. Chicken, fish and sausages sizzled on grills, while market stalls were crammed with an array of fresh fruit, vegetables cashews and basic groceries. As my

Portuguese was non-existent, a few gestures procured me a big bag of mangoes and some ice-cold Manicas to take back to the room. One of the real joys of Tofo is its safety, being perfectly safe to walk around day or night.

The next day brought unwelcome news. With the typhoon lingering it appeared diving would be out for the remainder of the week. However, when one door closes another opens. John suggested we dive the lagoon at the

northern tip of the peninsula. According to Tibeia—the staff's resident macro fanatic—its sheltered waters were a haven for critters. Sold!

The lagoon

Transport was via a car and a decidedly battered land rover and with everyone aboard, we set out on the 30-minute drive. Pulling into a parking area near our destination, the car had to stay behind, as the road ahead (or lack

thereof) was only suitable for the land rover's four-wheel drive. The staff loaded our gear to transport it to the water's edge before coming back to pick up the remainder of the divers.

After the week's adrenaline-pumping entry procedures, the lagoon proved refreshingly sedate. The sheltered waters were quite calm, with scarcely a hint of wave action. The maximum depth? No more than three metres.

After gearing up on the beach, all that

was required were a few steps to the water's edge. As the lagoon was shallow, it was a bit of a swim to the deeper water. While it certainly won't win accolades in the beauty department, the lagoon's sand-covered bottom proved to be a macro mecca whose tangles of seagrass housed a bewildering diversity of strange creatures. Perfectly mimicking their surroundings, filefish hovered motionless amid the seagrass, while one small clearing revealed a diminutive



snake eel peering from the sand. With bodies adorned with an array of bizarre spines and protuberances, an array of blennies remained immobile only to dart off when approached too closely.

A plethora of sandperch patrolled the sandy areas along with legions of sea urchins. Crabs were everywhere, which was a rather surprising sight during daylight hours. They also appeared to be a prime entree on the local menu, as partially consumed remains were strewn everywhere by unseen diners. At one point, Damien motioned me over to a cluster of weeds. Closer inspection revealed a dark brown seahorse stretched out on the sand. In true sea-

horse fashion, it always looked the other way as I tried to photograph it. To counter the dilemma, Damien swam up to it. As it turned away and faced me, presto, I got my image.

We headed back to the lagoon the following day, and it didn't disappoint. Although things started slowly, the critter parade picked up during the dive's second half. However, there were some hazards to contend with. Retreating slowly to frame a sandperch, I inadvertently blundered into a cluster of urchins. As I was wearing open toed fins, my big toe scored a direct hit. Fortunately, no pieces broke off inside, but the ensuing dull ache was a reminder to be more vigilant of my surroundings.

Seeing another diver intently photographing, I approached to discover a tiny octopus peering out from the confines of a shell. It was easily the smallest I'd ever seen, barely larger than a fingernail. Nearby, I discerned a blenny peering from the opening of a green vase-shaped "thing". Boasting a horned, pink-tinged head with puckering lips, the nervous fish quickly retreated into its odd looking domicile. Moments later, it popped out for another peek. Our game of hide and seek continued until I was able to obtain some frame-filling images. I later discovered the "thing" to be a horse mussel.

Glancing at my computer, I realized our allotted hour was nearly up, so I turned

ZAVORA MARINE LAB
The Zavora Marine Lab was established in 2009 to promote and facilitate research and conservation in southern Mozambique. Under the direction of B.Sc. M. (Ecotourism) Yara Tibiriçá (Iemanjá – Marine Conservation), the laboratory works in partnership with Mozdivers Zavora, Zavora Lodge and the Oceans Research.

Since its inception, the lab has developed vital research for the region and raised environmental awareness through a series of educational programs for both visitors and local communities. Zavora is one of the few places where both species of manta rays (*Manta birostris* and *Manta alfredi*) can be seen year-round and offers the unique opportunity to study a marine environment that has had minimal to no impact from recreational diving activities.

A number of projects are currently being developed to study manta populations, divers' impacts on mantas and their cleaning stations, diversity and distribution of nudibranchs, reef monitoring, socio-economic studies on dive tourism and the relative abundance of migratory humpback whales. Studies to date highlight the diversity of Zavora's marine life. Over 70 individual manta rays have been catalogued along with 83 nudibranch species (including a few undescribed species) and 214 fish species. In addition, four reef monitoring surveys have been completed.

Visitors wishing to learn more about marine science and the area's marine life may apply for a month-long internship program (limited space and CV required) or participate in a marine conservation scientific dive course focusing on manta rays (15 days of theoretical and practical field work, this program is exclusively for groups from six to eight people). ■

CLOCKWISE FROM TOP LEFT: Filefish displays ingenious camouflage blending into its surroundings; Snake eel pokes head out of sand; Crab; Dwarf lionfish



TOP LEFT TO RIGHT: Octopus eating crab; Seahorse; Lyre-tail sandperch; Porcupinefish

to swim for shore. At that moment, a peculiar shape caught my eye amid the undulating seagrass. Gelatinous in appearance, its spindly body bore a series of large flaps adorned with hair-like filaments. Perplexed, I realized this was no plant. Whatever it was, it was moving. Suddenly, its transparent "head" swelled disproportionately and proceeded to envelop some plant matter on the substrate. What on earth was I looking at? Back at the dive centre, the answer was soon revealed. It was a nudibranch—specifically, a *Melibe fimbriata* and a new species to add to my checklist.

Blenny in horse mussel



TECH DIVING

With the majority of its reefs beyond 30m, Zavora offers a plethora of opportunities for deeper and exploration diving. Previously, tech diving in Southern Mozambique had been limited to groups bringing all their own equipment, including compressor and a chartered boat. Mozdivers Zavora now offers technical diving and training through IANTD, opening up another realm of pristine, sites not yet dived.

An absolute must area is the wreck of the *Klipfontein*, a 160-meter-long cargo and passenger ship built in 1937 in Rotterdam for the Holland Africa line. On 8 January 1953, while enroute between Cape Town to Rotterdam, the vessel struck an object off the coast of Zavora and sunk within three hours.

Situated six kilometers off Zavora point, the vessel rests on a sandy bottom at 53m. The stern remains largely intact, lying on her starboard side and separated from the rest of the ship. Most of the hull is inverted or "turned turtle", lying on her decks, with the bow broken off and pointing towards the surface. Ascending to 36 meters in places, the wreck and is surrounded by a debris field of remains and artifacts.

Much controversy surrounds the ves-

sel's sinking, as eyewitness testimonies, the captain's log and the findings of the tribunal that followed contain conflicting accounts. The initial theory, concluded by the tribunal and at least one passenger account, is the vessel struck charted rocks about one mile off shore and drifted to her present position. This is now disputed, as the rocks in question are part of a very long reef sloping down from six to more than 20 metres. A ship traveling at cruising speed would be more likely to run aground rather than drift away after a collision. The most popular theory is that the vessel struck a 'dead' German U-Boat floating just under the surface. However, with no conclusive evidence, the sinking of the *Klipfontein* remains shrouded in mystery.

Today, the vessel has since become a vibrant artificial reef, home to lush whip and bush corals and a thriving fish population. Highlights of a dive include massive resident brindle bass the size of a small car, the huge port propeller and a chance to see mantas. Large aggregations of trevally, kob and barracuda are routinely encountered over the wreck while Zambezi and spinner sharks have been observed both on the wreck and during the blue water decompression stop. ■





CLOCKWISE FROM LEFT: Tubastrea corals; Scenes from Inhambane street life; Inhambane Mosque (top right); Inhambane Cathedral; (bottom right); Tiny octopus in shell (inset below)

Inhambane

With diving sadly finished, John arranged a city tour of Inhambane for my last day. A 20-minute drive from Tofo, Inhambane is one of the oldest settlements on Mozambique's east coast, having been a major port for Muslim

and Persian traders since the 11th century. A permanent Portuguese settlement was established in 1534 and became the site of East Africa's first Jesuit mission in 1560. Legendary explorer Vasco da Gama stopped by in the late 15th century, proclaiming it Terra de Boa Gente or 'Land of the Good People'.

A mixture of old world Portuguese

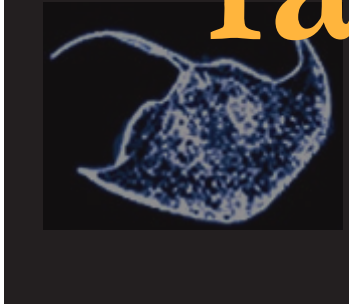
and Muslim culture, the sleepy provincial capital of 50,000 is renowned for its colonial and art deco architecture. The three-hour tour took in a variety of attractions including the museum, train station, a pair of mosques and the historic Cathedral of Nossa Senhora de Conceicao, which dates from the late 18th century. The area adjacent to the train station was somewhat eerie. Sitting astride tracks overgrown with weeds, decrepit steam locomotives and rolling stock sat where they were abandoned many decades ago.

Although my Tofo visit did exactly go according to plan, it was nevertheless highly enjoyable. It's easygoing tropical vibe combined with tantalizing glimpses of its undersea wonders had me eager to return. In the end, Mozambique proved to be nothing short of a revelation. During my two-week stay, I observed an array of creatures I'd always dreamed of. With its winning combination of fantastic diving and vibrant culture, it's a destination I look forward to experiencing again. Besides, the whale sharks will be waiting. ■



fact file

Mozambique



SOURCE: CIA.GOV WORLD FACTBOOK

History After nearly five centuries as a Portuguese colony, Mozambique gained independence in 1975. This was followed by large-scale emigration, a severe drought, economic dependence on South Africa, and a prolonged civil war which thwarted the nation's development until the mid 1990s. In 1989, the ruling Front for the Liberation of Mozambique (Frelimo) party formally abandoned Marxism. The following year, a new constitution provided for multiparty elections and a free market economy. In 1992, a peace agreement negotiated by the UN between Frelimo and rebel Mozambique National Resistance (Renamo) forces ended the violence. After 18 years in office, Joaquim Chissano stepped down in December 2004 and Mozambique experienced a delicate transition with his elected successor, Armando Emilio Guebuza, who promised

to continue sound economic policies that encouraged foreign investment. In October 2009, he was reelected to a second term. But, the elections were tainted by voter fraud, dubious disqualification of candidates, and Frelimo use of government resources in campaign activities. This resulted in the removal of Mozambique from the Freedom House list of electoral democracies. Government: Republic. Capital: Maputo

Geography Mozambique is located in Southeastern Africa. It borders the Mozambique Channel, between South Africa and Tanzania. Coastline: 2,470km. The terrain is mostly coastal lowlands, uplands in the interior, high plateaus in the northwest and mountains in the west. Lowest point: Indian Ocean 0m. Highest point: Monte Binga 2,436m.

Climate Mozambique's climate is tropical to subtropical. Natural hazards include severe droughts, destructive cyclones and floods in the central and southern provinces.

Environmental Issues Increased migration to coastal and urban areas have had adverse environmental consequences brought about by a long civil war and recurrent drought in the back country. Other issues include desertification and pollution of surface and coastal waters. There is also a problem with elephant poaching for ivory. The nation is party to: Biodiversity, Climate Change, Climate Change-Kyoto

Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Ozone Layer Protection, Ship Pollution, Wetlands.

Economy Mozambique was one of the world's poorest countries at the time of its independence in 1975. Exacerbating the situation was Socialist mismanagement and a brutal civil war from 1977-92. In order to stabilize the economy, the government embarked in 1987 on a series of macroeconomic reforms. This action in addition to donor assistance and political stability since the multi-party elections in 1994, led to dramatic improvements in the nation's growth rate. Despite these gains, the majority of the population remains below the poverty line and the country remains dependent upon foreign assistance for more than half of its annual budget. Subsistence agriculture is the main source of income for the vast majority of the country's work force. Smallholder agricultural productivity and productivity growth is weak. Natural resources: coal, titanium, natural gas, hydropower, tantalum, graphite. Agriculture: cotton, cashew nuts, sugarcane, tea, cassava (tapioca), corn, coconuts, sisal, citrus and tropical fruits, potatoes, sunflowers; beef, poultry. Industries: food, beverages, chemicals (fertilizer, soap, paints), aluminum, petroleum products, textiles, cement, glass, asbestos, tobacco.

Currency Meticals (MZN). Exchange rate: 1USD=26.70MZN; 1GBP=43.31MZN; 1AUD=27.17MZN; 1SGD=21.98MZN

RIGHT: Location of the Mozambique on map of Africa
FAR RIGHT: Location of Inhambane on map of Mozambique



Population 22,948,858 (July 2011 est.) Note: higher than average death rates due to AIDS. Ethnic groups: African 99.66% (Makhuwa, Tsonga, Lomwe, Sena, and others), Europeans 0.06%, Euro-Africans 0.2%, Indians 0.08%. Religions: Catholic 28.4%, Muslim 17.9%, Zionist Christian 15.5%, Evangelical Pentacostal 10.9%, Anglican 1.3%, other religions 7.2%, no religion 18.7% (2007 census). Internet users: 613,600 (2009)

Language Emakhuwa 25.3%, Portuguese (the official language) 10.7%, Xichangana 10.3%, Cisena 7.5%, Elomwe 7%, Echuwabo 5.1%, other Mozambican languages 30.1%, other languages 4% (2007 census)

Health Issues There is a very high degree of risk for food or waterborne diseases such as bacterial and protozoal diarrhea, hepatitis A, and typhoid fever; vectorborne diseases such as malaria and plague; water contact disease such as schistosomiasis; and animal contact disease such as rabies (2009)

Decompression Chambers

National Hyperbarics
Cape Town, South Africa
Nationalhyperbarics.co.za
Hyperbaric Medicine Centre, Durban, South Africa. 24 Hour Phone: 031 2685000

Websites

Mozambique Tourism
www.mozambiquetourism.co.za



Blenny in horse mussel



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POINT & CLICK ON BOLD LINKS



Equipment *chiz-zam*

Seac Sub F100 Pro fin

These fins have been designed specifically for heavy duty use by snorkellers and warm water divers. Seac have designed a series of channel patterns in the technopolymer blade to collect, contain and specifically funnel water giving the diver optimal thrust without excessive force. In addition the side ribbings are made of an innovative combination of soft and rigid materials that also increases thrust. Slippage has also been considered – there is a no-slip anatomic heelpiece positioned under the shoe to improve stability and give maximum grip on any surface. www.seacsub.com

MB Sub backup lamps X1-VB and X1-FF

The X1-FF is a 3.5 watt LED with a burn time of 4.5 hours (3 x AA batteries) or 15 hours (3 x C batteries). It has an intensive narrow beam (3 degrees) that means you can still signal, even in poor viz. A nice feature of this light is that it is modular, thus allowing you to upgrade your light in the future. The X1-VB is another modular 3.5 watt LED benefiting from the same burn times as the X1-FF. What makes this torch different is that the beam is focusable from 3 – 25 degrees. MSub state that this torch offers "perfect light quality at each focussing adjustment". www.mb-sub.com

Mares Hybrid BCD

Weighting in at 3.8kg, the Hybrid is a compact travel BCD manufactured from 420 Cordura. What makes this BCD unique its stowing capability. The rigid backplate is hinged so that it folds in half, whilst the harness and aircell are completely detachable. Mares state this BC "will still deliver stability in the water and excellent comfort". The Hybrid benefits from ultra low profile exhaust valves, seamless shoulder straps and special padding for the perfect fit. In addition it has trim weight pockets at the back. There is also a Hybrid "She Dives" version tailored specifically for the female form. www.mares.com

Oceanic B.U.D computer

A major rule of diving is "be prepared" and this can include having a redundant plan / profile / or piece of crucial kit. Enter stage left Oceanic. They've noticed a gap in the market and launched the BUD. It's a 'Back Up Device' for your computer. The BUD uses a Dual Algorithm which allows you to adjust its settings to match your primary dive computer. Then you simply clip the BUD to your BC, forget about it and go diving. Then if / when your primary computer goes pear-shaped, your Oceanic Bud will help you complete your dive safely. It's got a simple clean display, EANx to 50% and the ability to countdown a Safety Stop. www.oceanicworldwide.com



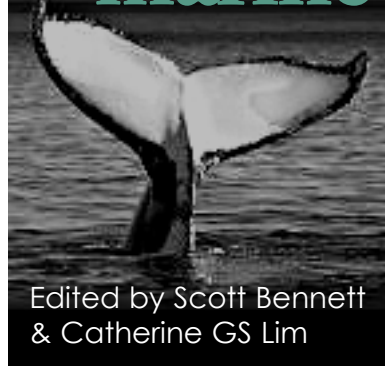
Edited by Rosemary 'Roz' Lunn & Arnold Weisz



Dive Rite Tech Tool Bag

Designed specifically for diving tools, the Dive Rite Tech Tool Bag holds all the essentials in a compact roll-up design. We had a play with it and found we could accommodate two crescent wrenches, a screwdriver, a 1/2 wrench, a pick, pliers, nips, tie wraps, and O rings. The tools are kept in place by the 1,000 denier Cordura Stretch Pockets and silicone grippers. And you don't have to rummage for your small necessities – there's a handy zipper pocket for these! This handy tool bag is also a handy size, measuring in at 22.5cm / 9 inches long by 15.2 cm / 6 inches wide. www.diverite.com





Edited by Scott Bennett & Catherine GS Lim

Dolphins can detect electrical fields like sharks do

At the Dolphinarium of Allwetterzoo Münster in Germany, a 28-year-old Guiana dolphin (*Sotalia guianensis*) named Paco has led scientists to an exciting discovery—that his species, and perhaps other cetaceans, can detect electric signals in the water.

This is the first-ever confirmation of a placental mammal (or marine mammal, for that matter) possessing this ability to detect electrical signals.

Prior to this discovery, it was believed that only fishes, sharks, amphibians and some monotremes have this ability.

For the Guiana dolphins, being able to sense the electric fields emitted by their prey gives them an edge when hunting for food. Being benthic feeders, they search for prey near the ocean floor. But swimming near the bottom of the sea causes sediment and mud to become unsettled, thus reducing visibility.

In such turbid waters, having electroreceptors does come in

handy.

But how did the discovery come about? On a dolphin's rostrum (portion of the head containing the jaws), there are several depressions (or crypts) running along it. Well, sensory biologist Wolf Hanke (from the University of Rostock in Germany) and his team had suspected that the crypts were not whisker follicles. "We thought they [the crypts] must have some function—they were pretty big—and otherwise would have disappeared during evolution," said Hanke.

So, when a Guiana dolphin at the Dolphinarium of Allwetterzoo Münster died of natural causes, the researchers examined the dolphin's rostrum and the crypts on it. Viewed through a microscope, the crypts' cellular structure looked like electroreceptors—with 300 nerve receptors plugged into it. There was also a gel-like substance in the cells, similar to the gel found in the receptors of fish.

To prove that the crypts were

indeed electroreceptors, the researchers turned to the zoo's remaining Guiana dolphin, Paco. They trained him to remain in a holding station, where his rostrum was ten centimetres away from two electrodes. A weak

electric current was randomly generated by the electrodes. For a reward, Paco was supposed to either swim away when the electrodes emitted a current or to stay put if

there was no current.

After 186 tests, Hanke concluded that Paco was indeed using his crypts to detect electric signals in the water—some as low as 4.6 microvolts per centimetre. Indeed, when a plastic shield was placed over Paco's rostrum, blocking the crypts, the dolphin showed no

"We have been so impressed by hearing and echolocation that we've ignored other, possible sensory systems in cetaceans."

ARCHILDER / GFDL



Dangerous toxin discovered in critically endangered Hawaiian monk seal

Researchers from NOAA have discovered a potent and highly-debilitating toxin in the endangered Hawaiian monk seal, a first-of-its-kind chemical finding that is now prompting investigations of other marine mammals in the state.



The toxin, ciguatera, is produced by marine algae common on coral reefs, and accumulates in fish species that are consumed by humans. Ciguatera, the human disease caused by ciguatera toxin, affects thousands of people every year worldwide and comes in the form of acute gastrointestinal and neurological illness with symptoms resembling chronic fatigue syndrome.

The study reveals that Hawaiian monk seals, whose population is estimated at 1,100-1,200, are exposed to significant levels of these ciguatera toxins. The threat could pose management challenges for this species that has been dwindling at four percent annually due to poor foraging success and additional environmental and human factors.

"Based upon this study, we believe that ciguatera exposure is common in the monk seal population," said Charles Littnan, study co-author and scientist with NOAA Pacific Islands Fisheries Science Center. "This study is an important first step. However, we still need to understand more clearly how widespread exposure is and more importantly what role it may be playing in the decline of the species."

Ciguatera lowers the threshold for opening voltage-gated sodium channels in synapses of the nervous system. Opening a sodium channel causes depolarization, which could sequentially cause paralysis, heart contraction, and changing the senses of hearing and cold.

Because they do not cross the blood brain barrier, ciguatera toxins solely affect the peripheral nervous system.

The major symptoms will develop within a few hours of toxin ingestion: vomiting, diarrhea, numbness of extremities, mouth and lips, reversal of hot and cold sensation, muscle and joint aches. The symptoms may last from days to weeks or even months depending on each individual situation. ■

SOURCE: WIKIPEDIA

“It is a tantalising possibility that this behaviour could spread before our very eyes—over a field season or two—and that we could track that spread.”

— Murdoch Cetacean Research Unit
Researcher Simon Allen

‘Conching’

Ingenious fishing method may be spreading through dolphin populations.

Murdoch Cetacean Research Unit researcher, Simon Allen, said this previously rarely witnessed phenomenon might be on the increase, suggesting that the technique is spreading.

“If—and that is a big if—we are witnessing the horizontal spread of this behaviour, then I would assume that it spreads by an associate of a ‘conching’ dolphin closely observing the behaviour and then imitating it,” Allen said.

Exciting new questions

The prospect of observing a learned behaviour spreading through a population over a short period of time is exciting in itself, but the behaviour also raises new questions about how exactly dolphins engage in conching.

“As yet, we don’t know if dolphins pursue fish into the ‘refuge’ of the large, empty conch/bailer shells or whether they actually manipulate the shells prior—perhaps turning them over so that the opening is facing up in order to make them ‘appealing’ to fish as a place to hide from the jaws of death,” Allen said.

know simply the

Researchers from Murdoch University believe a recently documented method of fishing may be spreading throughout a population of dolphins.

“If we were to set up a few shells—opening down—in a known location and either witness dolphins turning them over, see evidence of them having been turned over when we weren’t around, or better still, get some video footage of dolphins manipulating them in some way, then that would be priceless, since that implies forward planning on the dolphins’ part.

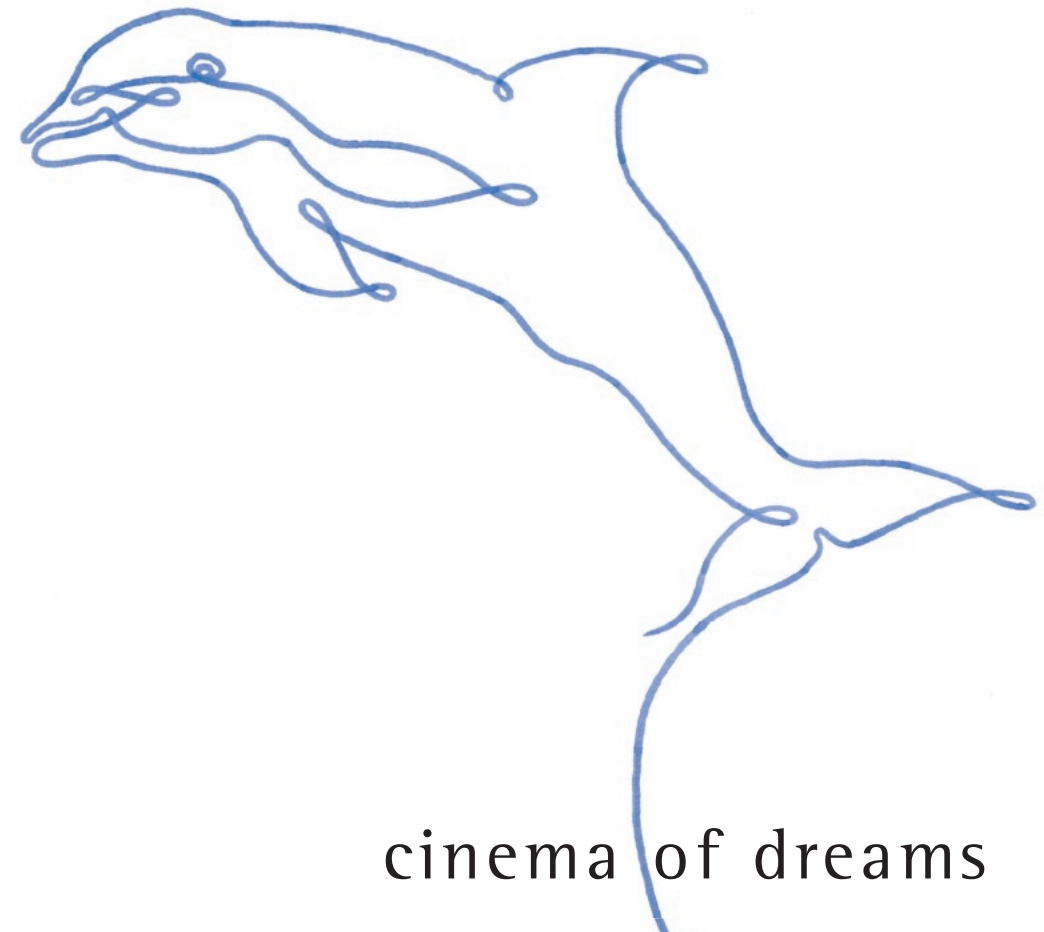
“I wouldn’t be too surprised to find such cunning and devilish ploys being adopted by Shark Bay’s bottlenose dolphins.” ■



Dolphin with conch

MURDOCH UNIVERSITY PRESS RELEASE

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Irrawaddy dolphins numbers triple in protected area

A recent survey in Burma's Ayeyarwady River reveals dolphin numbers have almost tripled in the past eight years. Several hundred more discovered to reside in coastal areas.

Established in December 2005, the Irrawaddy Dolphin Protected Area encompasses a 74-kilometre stretch of the river near Mandalay, from Kyaukmyaung and Singu townships in the north to Mingun in the south. "The Irrawaddy dolphin population has increased gradually, year by year, between Kyaukmyaung and Mingun. We found 32 in 2002 but this had increased to about 90 in 2010," said U Mya Than Tun, deputy director general of the Department of Fisheries.

Patrols

"We conduct twice-monthly patrols in the protected area. On the patrols, the project team conducts educational outreach activities, research on dolphin behaviour and fisheries, enforces the prohibition on illegal fishing techniques, and monitors the status of the dolphins and threats to their conservation," he added.

In another positive sign for the critically endangered species, several hundred more Irrawaddy dolphins have been discovered

to reside in coastal areas. In 2002, a survey of the entire Ayeyarwady River conducted by the department, Wildlife Conservation Society (WCS), Forestry Department and University of Yangon found Irrawaddy dolphins living in the 400-kilometre stretch between Bhamo and Mingun. In 2010, the department and WCS conducted survey activities into Gulf of Martaban area of the

Evidence is strong that very few young animals survive to adulthood, as older dolphins die off and are not replaced. This tiny population is at risk by its small size alone. With the added pressure of gill net entanglement and high calf mortality, we are really worried for the future of dolphins.

— Li Lifeng, director of WWR's Freshwater Programme

Ayeyarwady delta; Rakhine coastal areas, including the Mayu River, Kaladan River and Laymyoe River; and the Myeik Archipelago, especially Thameehla Island.

100 dolphins

"In Sittwe, especially in areas with a mix of fresh and salt water, we found quite a few Irrawaddy dolphins; we estimate there are about 100 in Rakhine coastal areas," said WCS coordinator U Aung Myo Chit. In addition, almost 100 dolphins had been spotted in both the

Ayeyarwady delta and Myeik archipelago." Many of these were found in 'no fishing areas' defined by local monks, who order residents not to catch fish within 300 metres of the compound of a monastery situated on the bank of a river," he said. However, it was stressed that protected areas and education programs needed to be extended into these areas to ensure the species' survival.

Lack of education

According to U Aung Myo Chit, due to a lack of education programs in these areas, most delta and coastal region residents don't even know what a dolphin is, mistaking it for some kind of big fish. "We need more funding to extend protected areas and educate people about why it's important to conserve Irrawaddy dolphins. One of the successes of our education programs in this region has been that local residents now know to contact the Department of Fisheries when they find a dead dolphin," he added. "We then research its morphology; feeding and cause of death."

Causes for decline

U Mya Than Tun said there were several causes for the decline in the Irrawaddy dolphin population in modern times, including destructive fishing practices and gold mining operations. Rising sea levels and the deforestation of watershed areas of the Ayeyarwady River also had a negative impact. The Irrawaddy dolphin is one of 32 dolphin species globally and one of seven found in Myanmar. Despite its name, it is actually not a true river dolphin but an oceanic species that inhabits brackish water near river mouths, coasts, and estuaries. Considered critically endangered, the dolphins live not only in Myanmar but also in other areas of South and Southeast Asia.

"We need more funding to extend protected areas and educate people about why it's important to conserve Irrawaddy dolphins," said U Mya Than Tun. ■



According to Dr Li Lifeng, director of WWF's Freshwater Programme, the research is based on photographic identification of dolphins through individually unique features of their dorsal fins. "Most of the dolphins can be identified, and we use that information to estimate the population size." Although this population estimate is slightly higher than the

previous estimate, the researchers were quick to note that the population had not increased over the last few years.

The population is ranked as critically endangered on the IUCN Red List, the highest international threat ranking for endangered species, and Irrawaddy dolphins are fully protected under the highest level of Fishery Law in

Mekong Irrawaddy dolphins on brink of extinction, said WWF

The Irrawaddy dolphin population in the Mekong River numbers roughly 85, with the survival of new calves very low, suggesting they are at high risk of extinction, environmental group WWF said.

Cambodia and Lao PDR. Dolphins in the Mekong continue to be threatened by gill net entanglement and the causes of calf mortality remain unclear.

"This tiny population is at high risk by its small size alone. With the added pressures of gill net entanglement and high calf mortality we are really worried for the future of dolphins," Li said. ■

SOURCE: WWF



SOURCE: USER JEAN-CLAUDE DURKA ON WIKIMEDIA COMMONS

Irrawaddy dolphin on Mekong River



Bahamas

— *Diving the Islands*

Text and photos by Charles Stirling

The Bahamas are an English speaking island nation known to most of us, but for very diverse reasons. For many living in Florida or nearby, it's a location for a quick day or weekend break for beach or casino. For Europeans, it's an offshore financial and investment capital. To many, it's the location for films and TV programs that feature water and sea, such as the *Pirates of The Caribbean*, *The Spy Who Loved Me*, or even the TV series, *Flipper*, plus many others. For divers, we think of Blue Holes and technical dives or one of the best places to see sharks.

Dive master holds a Caribbean reef shark at UNEXSO showing it in its state of stupor

Are the Bahamas a location worth going to as a visiting recreational diver? From an English diver's perspective, with the multitude of wreck dives around our UK

coast, the Mediterranean a short flight away, the Red Sea easily accessible, YES I still think the Bahamas offer something worth going for. Of course if you are in

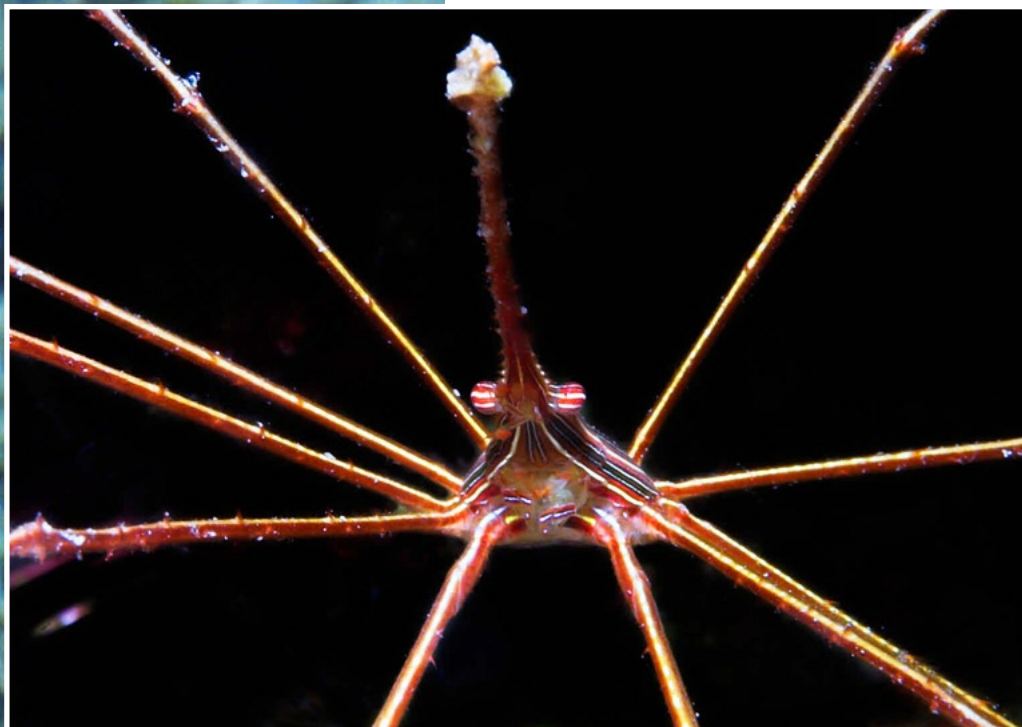
North America the yes decision should be even easier. They would be a good place to learn to dive with the family yet still offer a lot to experienced divers.

One of the reasons for the increasing use of the Bahamas for filming is of course the good diving conditions, so is that enough to attract sports oriented

divers? Without rivers visibility is excellent, water temperatures are tropical or near. The Blue Hole diving rapidly becomes one for technical or even very technical

dives with backup teams and lots of equipment, but some of this diving is possible and open for the recreational diver. Shark sighting is easily possible either naturally or





on specialist shark dives. Besides these two big attractions are the absolutely stunning great walls, many wrecks, and a big diversity in coral reefs with the world's third longest barrier reef all giving divers plenty to see. Along with this it's not overly crowded and can be very personal.

Diving in the Bahamas can of course be done from a variety of liveaboard boats often out of Florida as it's so close. This gives a good all American experience, easy multiple dives a day and depending on the trip either a single or multiple objectives. It does mean being on a boat most of the time but with some of the large luxury ones it's not necessarily in cramped quarters. Liveaboard trips also start from Nassau, Grand Bahama and Exumas. I've not done this, maybe another trip another time. I do enjoy time for exploring land based opportunities, meeting local people and having the variety that can come from being firmly planted on land even though I wasn't able to do much of this because of time constraints, but the theory is present.

Types of dives

Sharks always seem high on most diver's "want to see" list. Some consider the Bahamas as one of the world's best places to have that introduction or even an extensive

exposure. The tourism attraction benefits of sharks mean many operators offer a "shark dive" with sharks being fed. OK, we now have controversy! This is a touchy subject as many believe that divers should never interact or in any way influence any animal on any dive, while others are happy to spearfish or collect shellfish. It's the "leave only bubbles" debate. There is also the controversy of possibly altering behaviour by associating people with feeding which has produced a ban on shark feeds

and even fish feeds in some locations. How much should people "interfere" with natural system? As a diver, environmentalist and photographer I try not to disturb the environment, we are all told / trained not to touch when diving, to leave only bubbles (or spend the money on a rebreather and don't even do that). Most sharks are not going to be interested in being near divers, they are shy, we are not food, and they are wide ranging, so, worldwide, attracting them into view is done with chumming or feeding of

LEFT TO RIGHT: Nassau groupers help to keep reefs healthy by controlling smaller fish but still want a clean occasionally. One problem for these important fish is they are tasty to humans; Yellowline arrow crab; Soft corals are plentiful on some sites, often as individuals in small patches not as great masses



Shark taken along the line of divers at UNEXSO to be seen and touched (left); Shark feeding site but not a feeding dive and the sharks ignored divers (below)

site on the bottom. We were lined up kneeling on the sand shoulder to shoulder with our backs to a section of wreck, OK, an old decompression chamber, with hands kept out of the way. Once settled then the chain mail clad shark feeder opened a container of fish to hand feed one fish at a time to any individual shark that was closest. This was started first in front of the whole group, as the shark temperaments were judged as OK the feeding moved closer along the length of the line for each diver. Yes, sharks would be everywhere coming into the feed just overhead or along in front. The sharks made direct contact with the person feeding being rather gentle in taking the food from her hand.

After the food was gone she put her gloved hand on one of the smaller shark's nose which made it go into a quiescent, almost stupor like state and this animal was gently held and taken along the line for each visitor to touch on

the back. Talking to some of the divers after, all agreed this was great and one experienced diver offered the comment that the feed then touching a shark was the highlight of all his diving experiences. Previously he had been terrified by even the thought of a shark. This quiescent behaviour isn't understood but is well documented. The sharks having been fed, contacts made, the divers were free to look for sharks teeth in the sand for another 10 minutes before being led back to the surface with the safety diver. The woman shark feeder, the official photographer and I stayed down longer and in these calm conditions she was able to rest one of the larger sharks in her lap for nearly 6 minutes. Handling the sharks also meant fish hooks and sometimes ectoparasites could be removed.

So is the shark behaviour modified with this interaction? Doing a dive in the same area without the feeding some

some sort. It's a controversy that some see as very important, wanting to stop the feeding' while others see it as a tsunami in a tea cup. Whichever, it is done here.

Yes, the right dive site in the Bahamas and you will see sharks going about their business off in the distance. Occasionally if you can be very stealthy its possible to get a bit closer. Getting really close I did shark feed dives with 3 of the popular operators. First, all 3 were very safety conscious with visiting divers. They were aware of how it might change behaviour so amounts and frequency of food was limited and the food was natural, i.e. fish. None fed enough to be a significant portion of a shark's normal daily needs. One of the big things they are concerned about is the plummeting numbers of sharks worldwide and how incredibly important it is to bring this awareness

to the public. Each dive operator had slightly different approaches and methods to their shark feeds, but all had sharks to see up close. I ended up thinking these dives were a worthwhile introduction for many so I rather broke my own rules. Actually they were great fun and educational, you would really be missing a lot if not going on at least one of these dives.

Shark Dives

Sharks and fish do inevitably modify behavior when fed; they will learn the sound of a boat or divers with a pavlovian response to find food. How important is this, will it increase their chance of being caught by fisherman or be a hazard to us? Does the increased interest from divers seeing them outweigh the changes. Shark feeding in Hawaii was banned in 2002, now divers are not

aware of them as they aren't frequently seen so interest is lost for many. The cliché of "out of sight out of mind" could be appropriate.

UNEXSO wants to demonstrate that sharks are not wanton killers The most hands on and interactive was UNEXSO, Underwater Explorers Society, on Grand Bahama who use a site called "Shark Junction". After a short boat trip a thorough briefing was given which covered safety and organisation of the dive. They then went on to place a lot of emphasis on how they want to demonstrate that sharks are not an automatic menace to divers and the need for divers to be ambassadors spreading the word that sharks are not wanton killers.

The dive starts with all entering the water about the same time to follow a safety diver all together down to a sandy





Shark encounter with Stuart Cove's (left); Small Hope Bay shark encounter with a more hands off approach still had plenty of sharks up close and personal (below)

Bahamas

short but still to an area away from much of the other diving, the site was again a sandy one near an area with patch coral reefs and deep drop off. After the briefing and entering the water together divers were organised in pairs behind small mounds of rocks in a circle but with space between buddy pairs. The food, fish, was lowered in a hinged lidded steel box for the shark feeder to spear out individual fish to feed to an appropriate shark. As conditions were judged safe this was then done in front of each buddy pair allowing a photographer to take pictures of a swirling mass of sharks around each pair in turn. Here sharks could easily move between as well as above the divers so close encounters were frequent and from multiple directions. At the finish a short

time was allowed for tooth hunting before the group was escorted back to the boat.

Diving this site without a feed in progress sharks were around but not interested in divers. During the feed a second boat with snorkellers was stationed a distance away but close enough for them to watch and the sharks weren't interested in this.

Different approaches, but all three operations provided a good number of sharks, predominately or all being Caribbean Reef sharks, which might be a bit seasonal, to be seen up close (one nurse shark had turned up to play with the feed tube at UNEXSO). These sites had been chosen as near deep drop offs where the sharks would normally be found and away from other activity. Feeding in these ways didn't appear to be detrimental to either the sharks



sharks were present but none would venture closer than I would have expected, i.e. they frustratingly kept their distance. It was also noted that the number of sharks which turn up at the feed varies and they are not always the same ones. So this population of Caribbean Reef sharks maintained at least a semblance of normal behaviour.

Small Hope Bay Lodge

—Andros Island didn't want to associate divers with food.

At the opposite end of the spectrum on shark feeds Small Hope Bay Lodge, on

Andros Island, does fewer feeds, does them at a location some distance from their other main dive sites and has no direct interaction. They keep the site secret, even to the point of having the permanent buoy tied below water so fisherman don't target the area. The divers are organised again on a sandy area this time in a semicircle. When all was settled with the divers a frozen ball of fish was lowered on a steel rope stretched tight between a bottom ring and top buoy so sharks helped themselves as the fish ball melted. This kept the divers at a moderate distance from the feeding but sharks would

still skim over the top and past the divers. Once the fish was gone the sharks dispersed but could still be seen around the area while the divers went looking for lost sharks teeth in the sand.

Stuart Cove's Dive

—Nassau/Paradise Island wanted divers to have a good view of sharks.

Somewhat between the first two in approach, maybe with a bit more showmanship, they wanted to have divers see sharks up close but without the interaction of UNEXSO. The boat ride was



Large hard corals can be seen even on relatively shallow dives and without a wetsuit for warmth, Pagoda Reef, Exuma (left); Sea fans near the top of the reef at Hole in the Wall, Cat Island (below)

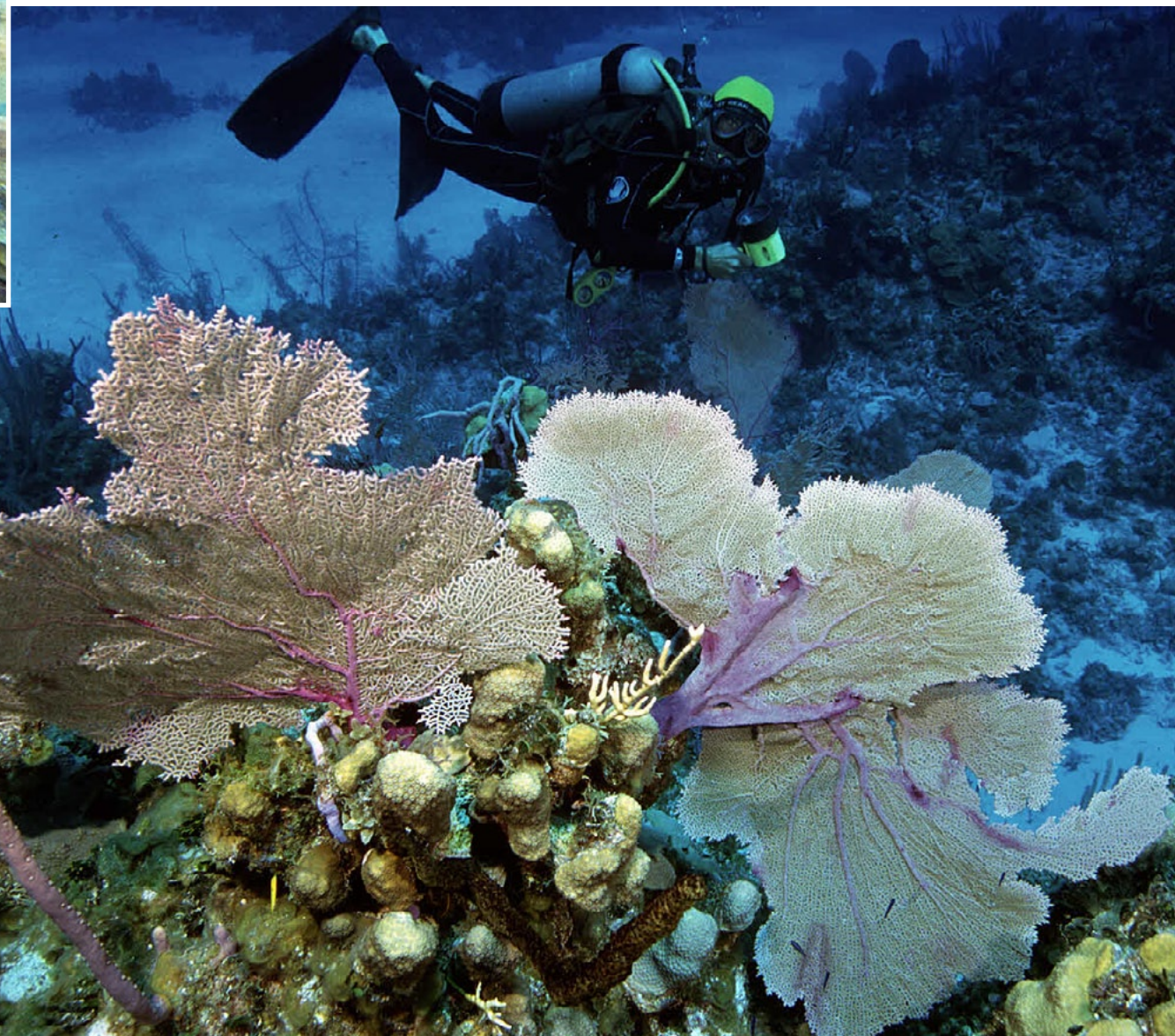
invertebrates.

As in so many other coral reef environments there are worries about both bleaching and coral disease, but here the visiting diver doesn't seem likely to find large areas of dead reef. What will be seen are patches or expanses of actively growing hard coral on the top of older coral which is becoming part of the inorganic hard surface needed for new growth. Whether the new growth is keeping pace with coral die-back can't be judged in a short visit and is more in the realm of long term research but what can be seen is good.

As so many other of our marine habitats the Bahamas have been over fished. The numbers and sizes of

fish doesn't seem as high as might be expected. What will be noticed is often the lack of larger fish though the range of species is reasonable. Different sites and even more so the different islands will show variety as would be expected considering the huge area and varying human densities covered by the country. The range of sharks present does give an indication that the reefs and environment are generally healthy as top predators need food and that food also needs to eat.

Large fish, even predatory ones such as the Nassau Grouper, have been shown as necessary for healthy reefs. Research in the Exuma Cays Land and Sea Park found, with protection, the grouper



or divers, more akin to putting a bird feeder out in the back garden.

Hawk's Nest

—*Cat Island had fisherman attract sharks.*

On Cat Island there wasn't a shark feed, but instead an impressive turnout could happen when visiting sports fisherman cleaned fish on the end of the jetty in the evening, and similar attractions occurred on Andros. Otherwise it was seeing sharks generally along the reefs on Cat Island, again at a distance but a thrill none the less. Occasionally a nurse or reef shark was seen sleeping under an overhang. On Exuma Island a shark feed was briefly tried at one location but it attracted in more sand tiger sharks so was discontinued as thought possibly dangerous for the

location. Jim Abernethy's Scuba Adventures liveaboard shark trips, out of Florida to Tiger Bay off Andros Island and other Bahamas locations, are designed specifically to see and dive with sharks and the variety can be good with many different species depending on location. Generally these are brought in by chumming and the trips are a favorite for photographers. At least 9 species of sharks can be seen in the Bahamas with probably the largest being the Great Hammerheads and Whale Sharks.

Coral Reefs

So, you dive or maybe you don't dive with sharks on one of these organised shark attractions, what else? Coral reefs are fantastically complex ecosystems and one of the big things

for many tropical dive destinations and it's no different in the Bahamas. On offer will be the worlds 3rd longest barrier reef, off Andros Island, other shorter barrier reef off other islands, patch reefs, small and large pinnacles and more. With tunnels, chimneys, canyons, sand shoots and of course walls all represented as types of structures within the overall systems. The corals themselves seem in reasonably healthy condition in the locations I've visited, with a diversity of both hard and soft coral species dependent on the actual site. But, corals are only part of the coral reef ecosystem and its the reef ecosystem we are really interested in when diving. That ecosystem has the hard corals forming the basic structure and providing nooks and crannies which can act as homes for fish and



Caribbean Trumpetfish (above); Smallmouth grunts (top right), often along with French grunts, were an ever present fish; Caribbean Spiny Lobster seen on many dives (bottom right)

were able to grow large. They are predating on parrotfish and others which eat algae off the reef, so at first the worry was fewer parrotfish would mean more algae smothering coral. Instead it was found the grouper predated smaller bite size fish reducing them in number but allowing some to grow beyond predated size. These larger parrotfish graze more seaweed than the larger numbers of smaller fish. Complicated, but

protection from human predation allowed healthier reefs in protected zones due to a better distribution of fish sizes. This over spilled to adjacent areas which then had both better fish to catch and better reefs. The lessons have been learned, just not acted on, as so often the case, we need many more protected zones.

Some put the blame for low fish numbers and small size on big American pleasure fishing boats



who have come in, fished to load holds with tons of fish bedded down in ice then departed to pay for the holiday by selling the catch privately back in the USA. The Bahamas government have recently, January 2007, started trying to control this with tough new legislation and catch limits. Others put the over fishing down to Bahamians who supply local restaurants on a casual basis. Protection is being provided in addition to fishing limits with several important protected areas: the Exumas Land and Sea Park and the Pelican Cays Land and Sea Park plus a few small sites. These protected locations are showing larger sizes and populations of both fish, conch and lobster. Campaigners have been working on adding other protected areas but progress seems slow according to environmental groups. Whatever,

the fish are needed to keep the reefs healthy and with time hopefully what we see as divers will improve from good to great.

Diving the reefs can be as relaxed as a shore or maybe a boat dive in a few meters depth at some locations, but most often will be by short boat trip with depths to the more usual 10 to 30 m not counting some of the walls which can be sheer with effectively no bottom. The patch reefs often have sand adjacent providing a reef friendly diver entry point which can cater for all levels of experience.

For example on Cat Island out of Hawk's Nest it can be a stroll to the beach and dive staghorn coral with schools of yellow snapper to keep you company. Or a night dive on Andros with flashing underwater luminescence on the boat ride out, then after slipping into the dark water on

site to have it come alive with more bioluminescence before finding your light attracts krill that can literally explode when hit by a nematocyst from a seemingly docile coral. Down amongst the



Bahamas

coral heads the arrow crabs and feather stars are out the, parrot fish in. Maybe it's the shallow fore reef of Jean's Dream on Andros, a coral garden with a topography of hard coral columns for as far as one could swim in any direction. The columns or heads maybe a foot or two in diameter, 6 foot high a few foot apart, some acting as cleaning stations with little yellow wrasse and blue damsel fish. The blue surgeon fish, parrotfish, French grunts or smaller grouper would call in the cleaners with a flick of the tail and a vertical orientation. The hard corals having the usual Christmas Tree worms, the banded coral shrimps and other invertebrate life. Maybe you dive Duck Cay off Exuma with its sandy rivulets running between the good mix of hard corals in large bommies and the lobsters hiding under ledges.

Just a little deeper might be something like that on Caves Reef out of Grand Bahama with its deep hard coral gullies and shoals of good sized goat fish, large parrot fish and squirrel fish holding



Theo's wreck

One of two sisters

the "Playground" just off Cat Islands Hawks Nest, or Turnbull's Gut off Andros. To float along a wall with with table corals, whip corals extending out, the shark lazing along above you, the turtle keeping you company gives a fantastic feeling.

Not all areas of wall will feel the same. On the northerly islands of Grand Bahama, Andros or Paradise some of the walls edging the deep channels started with the flat reef top then 50 degree sloping sandy sections with only scattered coral growth down to a deep diver depth over which much of the dive was conducted, this before dropping to near vertical and below live coral depths. These sections are not as dramatic so check the descriptions with the dive shop. This contrasted with walls at Cat Island and I gather on Long Island and others where a reef top possibly as shallow as 10 m depth could immediately change to vertical and be covered in splendid live coral for some distance down the sheer face.

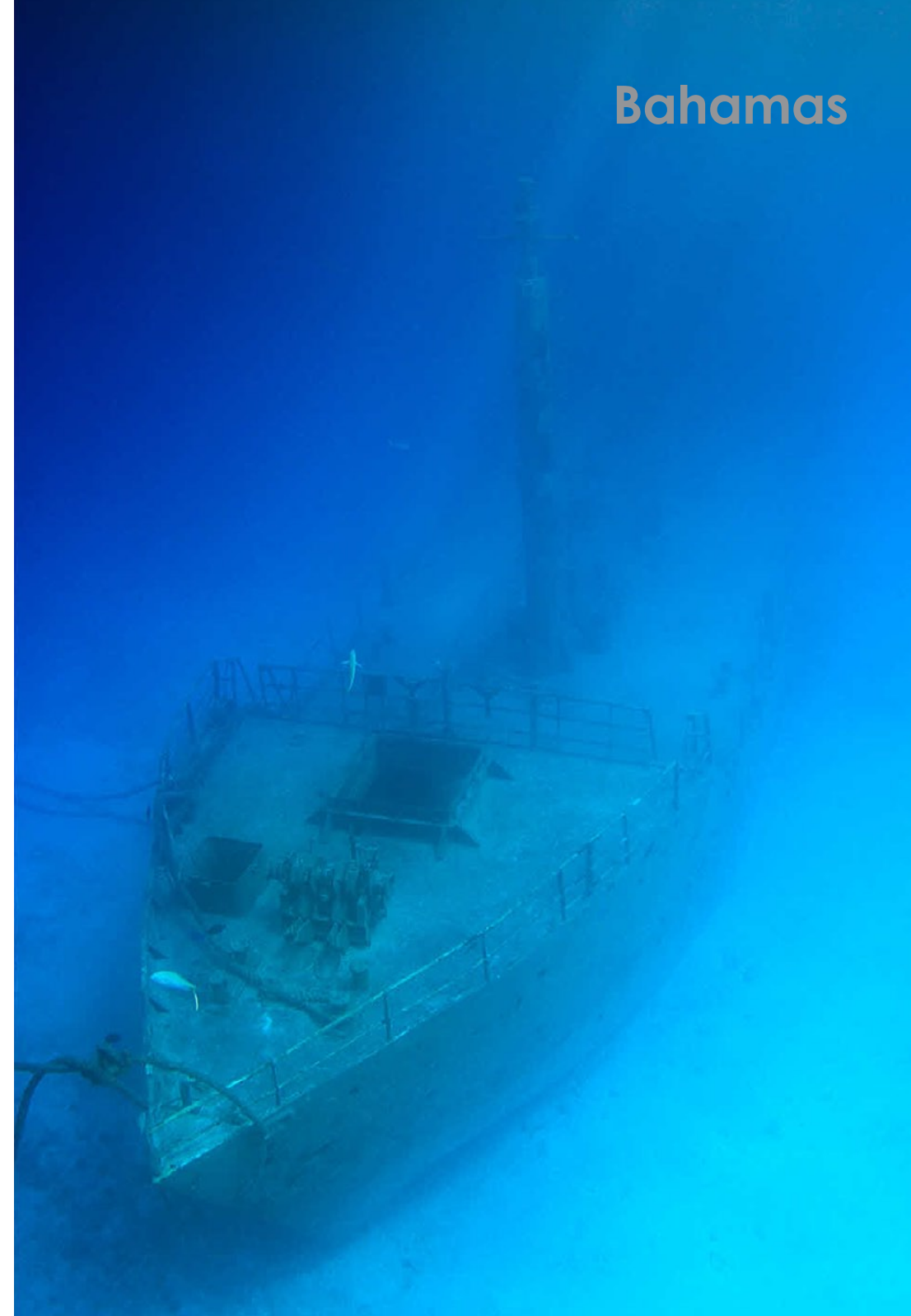
Many of the areas of wall, indeed other reef areas, have been little explored on many of the island. Some of my dives on Cat Island my buddy and I were the only ones present without another boat let alone a diver seen the whole day while much of the reef on Andros hasn't been fully explored. Check out the Family or Out Islands for the unexplored. Yes, you can have great dives on coral reefs, you don't need to be a specialist in these animals to enjoy them and what they have produced.

Bored with coral?

Wrecks, both ancient and modern, accidentally or purposely sunk are on many of the islands and many a diver's "to do" list.

Those sunk for diver tourism are as interesting or even more so as accidental ones and offer both habitat and structure to explore. What is it that wrecks do to attract divers? A bit of adventure, often some history, a man made structure to explore in a way impossible on land, they are habitats and, hey, it can just be fun. There are way to many in the Bahamas too visit them all, I managed a few: Papa Doc and Theos Wreck on Grand Bahama, the Marion on Andros, the Twin Sisters out of New Providence were all great fun dives.

Theos Wreck Theos Wreck, a 70 metres (230 feet) long cement hauling freighter was purposely sunk in 1982 by the suggestion of Theo Galanopoulos as a gift, the first artificial reef of the Bahamas and tourist attraction for the Bahamas government. It is rated as one of the best dives of Grand Bahama by many and it is a great dive. It lies at 30 m (100 ft) in an area with some tidal currents so is treated as a dive for the experienced. The ship was built in Norway in 1954 as the M/S Logna and used for cargo sailing between Spain and Norway then bought by the Bahama Cement Company to carry sand between Florida and Nassau and Eleuthera. A refit couldn't be financed economically so it was decommissioned and Theo came up with his suggestion. Now it has good growth of gorgonians, sponges and corals with grunts, a few lobster, eels and more making it home with visits from the occasional shark, ray or turtle. It's an easy wreck to penetrate with open holds and access to the engine room with enough space so it doesn't feel claustrophobic and it looks like a ship not just a scrap yard.



Bahamas

position near the bottom, maybe a small reef shark cruising past or other sites with tube or barrel sponges. What will be seen does change with depth, the largest differences above or below the 7 to 10m depth band. The sites are numerous just to make a major

understatement and you can go on getting deeper till you drop over the edge of a wall. It can feel incredible gliding through a large archway or navigating a narrow coral tunnel to exit in clear blue hovering over 1000 m (3000 ft) of nothingness as at

Papa Doc wreck At nearly the other end of the scale from Theos is the Papa Doc wreck which is a big boat really not a ship. It came about as the original by this name was a gun runners wooden vessel now all but gone. The site was popular so a new steel vessel, 50 foot length, was added in the same location in 45 foot of water. It looks like a boat should

look, upright on its keel and small enough to easily take in, possibly with time to explore the adjacent reef as well.

The Marion Andros Island, The Marion, a construction barge with crane was commissioned to move some equipment for the US Navy AUTEK base in 1988. It happened that trying to lift a

buoy a bit heavier than its rated lifting capacity didn't quite work, it sank, giving us a good barge with a lot of interesting shapes in the crane to swim around at a maximum depth of 70 feet (21 metres) on a white sandy seabed. A fun dive with potential to explore; maybe its not going to enter the records as a classic site but instead will show you a grouper or two, French angelfish, grey snapper, fairy basslets, goatfish. maybe the resident eel and passing barracuda. While if you look hard enough invading lion fish may also be found.

Film set wrecks New Providence has remnants of film set wrecks such as the vessel Tears of Allah from 'Never Say Never Again' and the Vulcan

Bomber from 'Thunderball', the Treasure Wreck wreck built as a prop for 'Into the Blue' and sunk in 2004 along with many others which can be dived. I only managed the Carib Breeze and Tropic Breeze Wrecks site also known locally as the Twin Sisters. These are two 200 foot tankers donated by Shell and sunk next to each other in 2000 to create an artificial reef. They sit in about 70 foot on a white sandy bottom just next to a sand slope covered in garden eels. On top of the shallow plateau, up the sand slope, the garden eels attract in visiting rays and turtles browse the eel grass. Both the wrecks are ship shape in great condition giving more than enough to visit for a dive or two.

I've only had a taster of the possible wrecks on offer, maybe

one of the problems with the Bahamas, there can be too much to do and see. For a real wreck junkie it will take a bit of extra research finding which island offers the most of what you want to see then organising a specific itinerary with a dive shop before arriving, as the normal fare offers variety not specialisation. For my British cohort wreckies, the wrecks, as for most diving, are no take zones so you can't bring back the odd chunk of brass or old porthole.

Blue holes

All of the main islands of the Bahamas have blue holes as might be expected from the geological history. Blue holes generally are the collapsed roof to an underground cave

Barral sponges (left) of a number of species along with other sponges commonly seen at some locations; Divers (below) in the Great Blue Hole

which were formed when the sea level was low enough to leave the islands high and dry. These are often listed on itineraries but not always visited regularly either due to some having awkward locations, with others the technical diving requirements don't place them at the recreational level. I suspect some divers also find blue holes less interesting than first imagined as they have dived ones which can be seen as "just a clear blue water dive in a hole without much else" but this depends greatly on the individual site. Andros Island has the best known ones and is the capital for blue holes with at least 178 on land another 50 or more in the sea, more than anywhere else in the world. Some of these are classics

Bahamas



of diving history both in exploration expeditions and resulting from this in filming terms.

One of the exceptional marine ones known as the Great Blue Hole or as King Kong's Cavern is visited by Small Hope Bay Lodge on a regular basis. It is the second deepest in the

Bahamas and measures about 300 foot across at the top. Its entrance region is large and diverse enough to need a number of dives just to see all the potential at this level. Most commonly one descends to the rim at 12 m (40 foot) over its edge and down an ancient waterfall chute



CLOCKWISE FROM LEFT: You may find Atlantic bottlenose dolphins out in the wild if you are lucky, these off Andros; Yellow sub get together; Fish meet the yellow sub

vehicles, OK there are some differences from most others. Here you have a bubble top even allowing for your hair to stay dry, glasses to be worn, and no need for any previous scuba experience. They are free ranging but tethered to the surface with a float and accompanied by swimming scuba diving safety attendants. The participants have a briefing on shore, join the dive boat and proceed to a rather good area of shallow coral reef with sandy bottom adjacent. The SUBs are winched overboard with



maybe show non diving family members some of what we see. For experienced divers it may seem a little tame, but one comment I heard was that with the bubble top they had a much wider all round view so could better understand the reef than ever with the more restricted view through a mask.

educational. The programme at UNEXSO strives to be very dolphin friendly with controlled conditions so no harassment and good conditions. Three levels of interaction are offered; standing in the water with them, swimming with them in confined conditions and swimming with them in open seas encounters. The

Bahamas

Swimming with dolphins Another activity which, here in the UK really gets the controversy going with a few, is swimming with dolphins. It's an activity done in many countries around North America and the Caribbean and in the better offerings seen as fun-

before continuing along under a huge overhang effectively producing a cavern of amphitheatre proportions. Giant boulders are wedged floor to ceiling here and the dive continues, depending on air, under and among crevices of these boulders exiting in what they call the big room before returning to the waterfall chute. More specialist dives, still at the recreational level, explore other areas around this blue holes entrance and tunnels leading off it to other entrance points while technical divers could have a field day exploring deeper reaches of it. The Great Blue Hole is a fantastic site and totally blows the concept of blue holes just being plain boring holes in the ground. It does need to be dived on an outgoing tide, preferably in the morning for better light penetration, but isn't constrictive nor need lights.

As a note on the more technical side Small Hope can take recreational divers

into twin set realms with full introductions then a range of great dives that require this form of redundancy for blue hole, cave and deeper dives on walls along with helium for trimix.. They have nitrox and can mix to requirements including hot mixes. They didn't have rebreathers on offer, but can arrange supplies of absorbent.

Life is not all diving

With the tourism hat on, the Bahamas offer the non-diver some attractions which are at least approaching the realms of the diver and what we find so exciting about our special underwater world. Yes, they do have aquaria but moving beyond that are little Yellow Submarines at Stuart Cove's Diving in Nassau/Paradise Island.

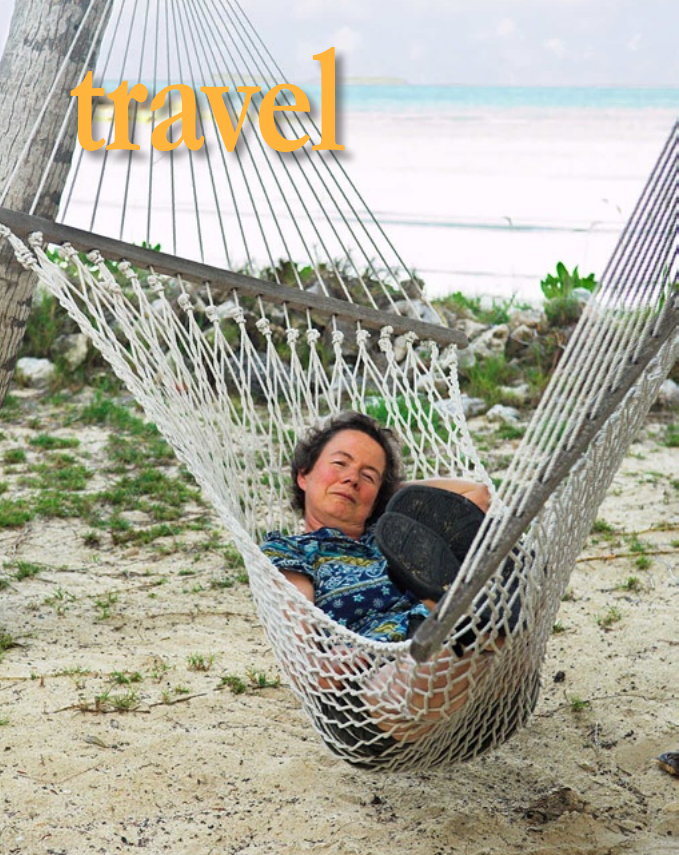
Little Yellow Sub To a diver the Yellow Submarines are manned dive propulsion

the bubble top above water level where you enter it before it is lowered further and freed. The new driver heads off, maybe with a gentle crash or two with other SUBs as steering is learned, to explore along the reef at 15 foot depth and hair still dry. The attendants on scuba point out interesting features and fish then feed tiny amounts of fish feed, which brings in absolutely hordes of yellow jacks and more, in front of each SUB diver.

These SUBs seem a stunning way to



CLOCKWISE FROM LEFT: Learn to just relax; Exploring the mangroves at Lucaya National Park on the boardwalk Not everything is diving on Grand Bahama even if it is wet at times; Dive boats weren't overcrowded, this one at UNEXSO



Topside

—Life, besides not being all diving, not all of the Bahamas is underwater Americans comment that the Bahamas are now an expensive destination, while from England I noticed it was just a little less expensive than staying at home. Value partly depends on expectations and what you do. The Family Islands (i.e. all but the highly populated main two) have small populations, relatively few tourists, a laid back lifestyle and an infrastructure which fits but that infrastructure can creak if pushed too far. Life here doesn't always depend on the clock, nor on your wallet, just sometimes, and you need to learn which applies to a situation.

human participants I talked to really enjoyed the experience, and one who had done this at another location said this one was far better as it offered more freedom of interaction both for her and the dolphin.

On Exuma I stayed at the Club Peace and Plenty, Georgetown, diving with the attached Exuma Scuba, all very convenient except ordering lunch in the hotel between dives took



only gets about 8000 tourists a year, most for the world class bone fishing. These small numbers mean a choice of accommodation is limited but there are a number of small hotels, some very reasonably priced, but not necessarily in easy reach of

friendly and helpful, at the Andros Yacht Club they hunted down a computer guy, a friend of a friend sort of contact to try putting it right. Sadly that was to no avail, the sickness continued, but Small Hope and Stuart Cove's all helped out with access to their computers, till after 2:30 in the morning on one occasion. It's the sort of friendly helpfulness which seems

endemic in the Bahamas, but you need to play your part with flexibility.

longer than the surface interval. I ended up using the local store to buy quick soup packs, at 20 cents, to heat in my room's coffee maker to save time and money. Lunch was thought of as a relaxed laid back time to contemplate life not a fast, quick snack in a busy schedule.

At Small Hope Bay the package is an all inclusive one including food and drinks (out of busy hours you are welcome to be your own bar tender, without a tab!) which gave an incredibly friendly, sociable and relaxed ambience, but cost was more than at the Andros Lighthouse Yacht Club & Marina so I stayed 3 nights at Small Hope and two at the Yacht Club. Andros Island



Small Hope which is now the only diving establishment.

With digital cameras a computer is essential, mine went sick, really sick. I found the Bahamians and other locals

is present to explore / exploit, sadly I didn't. Ideally for this your own transport would be useful. On Paradise Island I never really got beyond the Nassau Beach Hotel except on Stuart Cove's

So little time

Limited time is always a problem for divers. On Grand Bahama and Nassau/ Paradise Island the shopping experience

Swimming with the dolphins can be hard work keeping up as not holding just gentle contact



Diver (left) signals OK in the Great Blue Hole; The wreck of the *Marion* (below)

oriented shopping, entertainment; hotel region adjacent to the capital city of Freeport. It does have a moderate amount going on even attracting in locals from other regions, but it can be worth exploring further afield. I did some exploration of Grand Bahama which is a nearly flat island intersected with many purpose built canals allowing the many prestigious houses to moor their boats adjacent. These canals plus the mangroves offer excellent breeding grounds for marine life. I was able to have a quick tour driving around areas in and outlying Freeport; seeing the banking and business district

through the car window, the horse riders along a beach and in the sea, the mounds of conch shells by market stalls, and other near empty beaches. These explorations did take me east to The Lucayan National Park, a 30 minute drive on empty but good roads to one of the few protected zones. Here a boardwalk trail through mangroves meanders to an absolutely stunning white sand beach deserving more leisure time than I could give it.

The Family Islands generally offer less for the shopaholic but I found they can be great for the eco-tourism, local crafts and customs and I understand also for fishing, sailing, general water sports and simple relaxation on good beaches. With Hawk's Nest I wandered up the local estuary exploring mangroves in a flat bottom boat, and I met local basket makers on a car drive both on Cat and Andros while on Andros a visit to the batik factory, which supplies most of the other islands with printed materials, was a walk down the road from the Yacht Club.

Diving is well catered for, but I still took my own kit. The internal flights don't have big baggage allowances nor offer extra for divers but flights are short so the extra charges are not completely prohibitive just annoying. I have looked at dive operations on 5 of the islands and all offered up to date, good kit for hire but official regulations are limited so check what you are hiring. The one item I would always recommend taking on any trip is your own exposure suit, in this case a 5 mm wetsuit



Shallow reefs with the deep blue of the Tongue of the Ocean as seen flying between Grand Bahama and Nassau

seems the most appropriate, you know it fits. People come in too many shapes and sizes for any hire shop to always have a wetsuit that's right.

Yes, the Bahamas are tourist centric for a visitor and it does take a little effort to move beyond that but they do offer some really good diving and more than enough to keep non-divers happily occupied. At least at some places, such as Small Hope, families can be catered for with child care provisions. So just a bit of added effort and more time a great deal extra could be done or maybe just learn to relax, lay back and the Bahamas can be a great place to unwind. I must give that a try sometime. ■

Interested in marine life since childhood in California, Charles Stirling tried scuba in University but the need for glasses and at the time lack of knowledge about prescription masks stopped this as

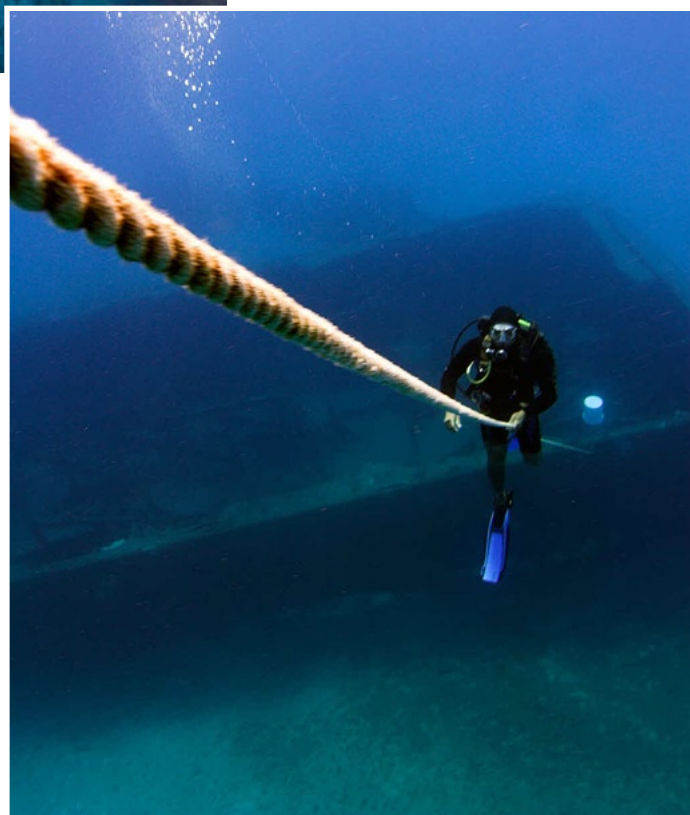
an activity. Did research on marine invertebrates going on to do PhD in Zoology emphasizing neurophysiology and electronmicroscopy. Rediscovered diving about 10 years ago when heard prescription masks were available. Did CMAS, then PADI, BSAC and TDI training before adding underwater photography. Now publishes frequently in the UK Sport Diver and other UK diving and more general magazines. Became the environmental correspondent for the BSAC Travel Club a few years ago.

Great Barracuda



pickup bus. The hotel is in a complex of interrelated hotels (OK, it was, as now being demolished for a larger more upmarket one), a casino and a couple of restaurants isolated from anything else within walking distance. No feel at all of the Bahamas will be obtained with this isolation. Previously I have stayed at the Orange Hill Beach Inn, also isolated. This isolation seems part of a modern day way to contain tourists and can be great if it's what you want otherwise transport becomes essential as there can be so much to experience.

On Grand Bahama UNEXSO are located in the Port Lucaya area and I stayed in both the Pelican Bay and adjacent Sheraton Our Lucaya Hotels. Port Lucaya is a relatively newly developed rather tourist



Grand Bahama

Dive diversity

Text and photos by Matthew Meier





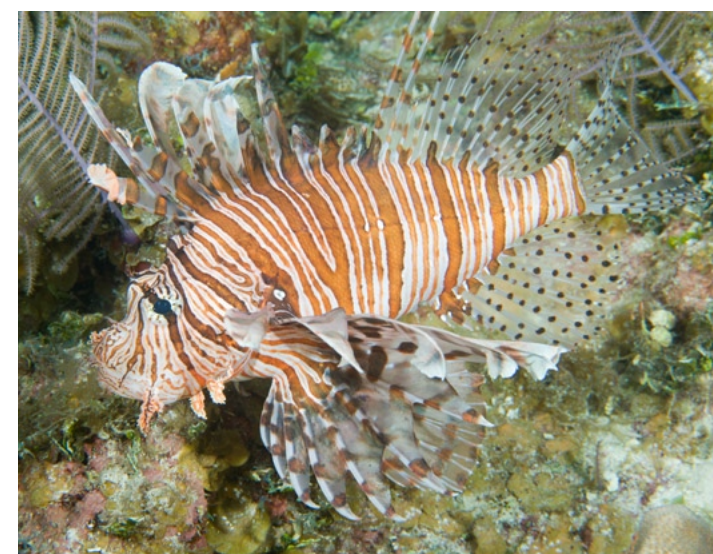
Black grouper (left) having its mouth and body cleaned by cleaning goby fish; Large green moray eel (top left); Scuba diver at large coral bommie as a Caribbean reef shark swims past (above)

Have you always wanted to dive with sharks? Hug a dolphin? Explore shipwrecks, caves and colorful coral reefs? What if you wanted to have all of these adventures wrapped into one destination? Then, it is time to visit the Caribbean island of Grand Bahama.

Located 55 miles due east of Florida and roughly 100 miles from Ft. Lauderdale

or Miami's International Airports, Grand Bahama is easily accessible from the U.S. mainland by plane, boat or cruise ship. It is the fifth largest of the approximately 700 islands in the Bahamas island chain while enjoying a modest population of only 75,000 people. The Bahamas capital city of Nassua alone has 250,000.

The relaxed atmosphere of Grand Bahama is apparent as soon as you set foot on the island. Simply looking down upon the turquoise waters during the flight in is enough to kick start your attitude adjustment. Those crystal clear waters are leg-



Common lionfish on reef. PREVIOUS PAGE: Cristina Zenato hand feeding Caribbean Reef Sharks





Common bottlenose dolphins leap out of the water in unison next to a UNEXSO dive boat

trainer gave a briefing explaining the plan for the day and an overview of hand signals with which to elicit behaviors from the dolphins. Once at our destination, the trainer expertly managed the dolphins as they were sent to one diver or snorkeler at time to perform behaviors at our request. We were able to swim alongside the dolphins, have them spin us in the water, give them a hug and go for a ride while holding onto their dorsal fins.

I have spent a lot of time in the water with dolphins and have to admit that I never tire of the experience. There is something truly remarkable about

interacting with these amazingly intelligent and playful creatures.



endary for their astonishing visibility, so it is no wonder they have played host to several Hollywood movies including *Pirates of the Caribbean*, *Splash*, *Cocoon* and the James Bond movies *Thunderball* and *Never Say Never Again*.

Dolphins

Grand Bahama is the only place in the world where you can interact and swim with captive dolphins in the open ocean. The Dolphin Experience is run by UNEXSO (Underwater Explorers Society), and they are responsible for a breeding program of 16 Atlantic bottlenose dolphins. These second and third generation captive dolphins live in a natural nine-acre lagoon called Sanctuary Bay.

There are several different dolphin encounters to choose from, with varying levels of involvement. The dolphin interactions range from standing on a submerged platform, to swimming with dolphins in the lagoon, to open ocean snorkeling and scuba diving with dolphins along the coral reef and ultimately to becoming a trainer

for the day. At every level, the dolphins perform behaviors on your command, interact up close and personal and even pose for photos while you give them a hug or a kiss.

I was fortunate enough to be able to participate in both the open ocean snorkel and the scuba diving encounters with the dolphins. On both occasions, two dolphins escorted us from Sanctuary Bay, following their trainer's boat through the canals to the open ocean. Along the way, the dolphins were asked to perform jumps and spins beside the boat, and at their trainers command, they exploded out of the water in perfect unison, soaring high in the air, before splashing back into the ocean. Prior to each encounter, the dolphin



Common bottlenose dolphin poses for pictures with a scuba diver kneeling on the sea floor (above); Snorkelling with a common bottlenose dolphin (left)



Scuba diver hovers over the bow of this 50-foot, triple-decker tugboat called *La Rose* Wreck

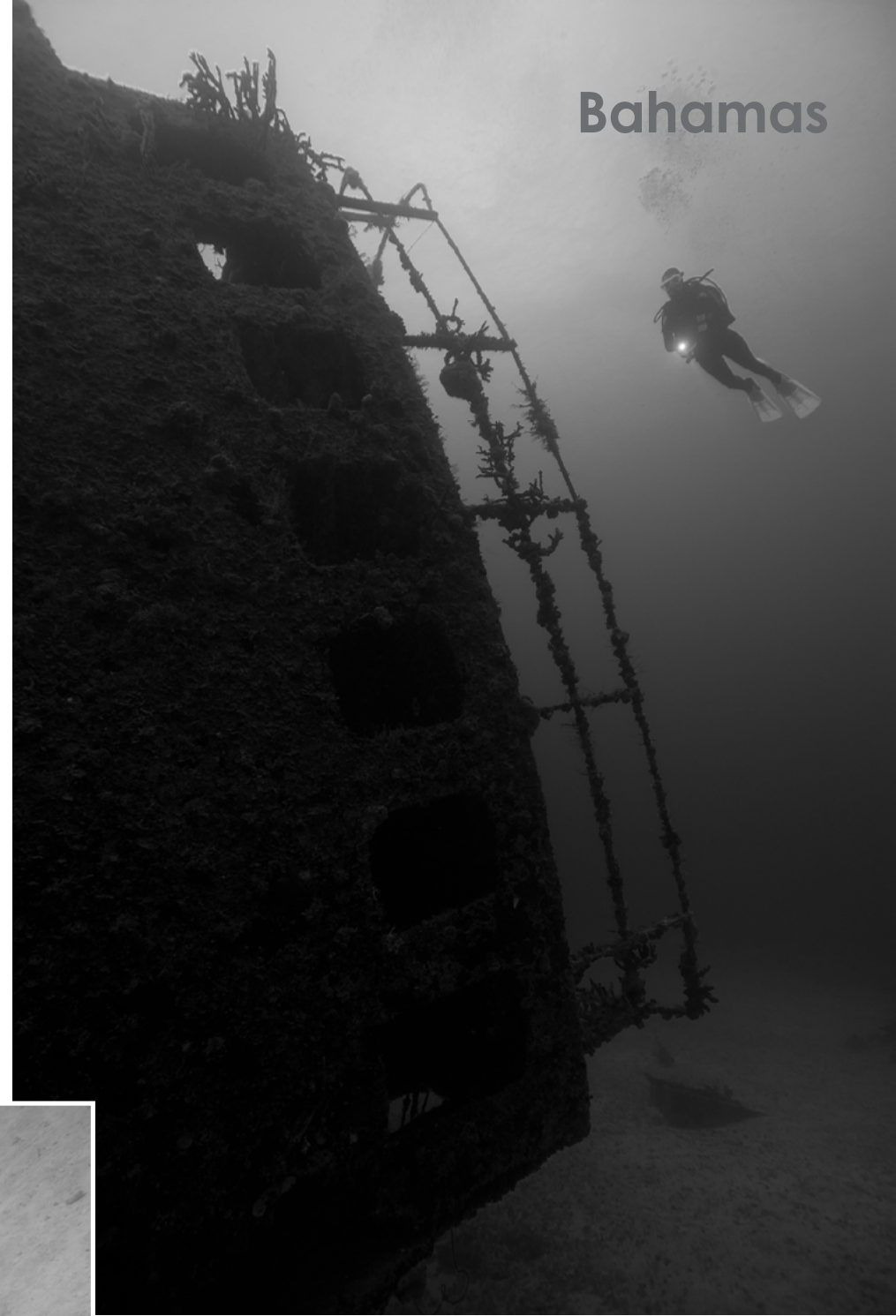
mooring line, *Theo's* Wreck is an impressive site as she materializes from the depths. The wreck has a myriad of coral and sponge growth on her hull and a resident green moray eel can usually be found. Given her size and depth, it takes several dives to explore the full structure properly. Sadly, we were only able to dive *Theo's* Wreck once during our stay, and I look forward to seeing more of her on my next trip.

La Rose is a classic triple-decker tugboat that sits upright in 95 feet of water next to a dive site called Moray Manor. Sunk in 2004 as an artificial reef, the wreck's close proximity to the sloping coral reef allows for longer bottom times by using a tiered dive profile. We were able to spend 10-15 minutes on the wreck at 80-90 feet and then work our way up into the large coral heads that populate Moray Manor, all the while being escorted by a large, inquisitive barracuda. Once on the reef, we were entertained by a school of bar jacks congregating above a huge colony of

great star corals.

Another popular site we dove was Papa Doc's Wreck. Though truth be told, the only thing left of the original 1968 shipwreck were the engine blocks. Sunk in a storm, the original boat carried a group of mercenaries headed to fight in the Haitian revolution to overthrow François "Papa Doc" Duvalier. Now in its place, sitting 50 feet deep and upright in the sand, is a tugboat named the *Badger*. The wreck supports a healthy array of reef fish safely tucked away in the wheelhouse and significant coral and sponge growth is starting to show on its hull. If you look closely out in the sand you may even find a kitchen sink nearby. In my case, a Caribbean reef shark and some trailing bar jacks were kind enough to swim between the sink and the tug making for a fun photo.

The last of the shipwrecks we visited during our stay was called the *Pretender* Wreck. Other than the base of the hull and twin props sticking up a few feet out of the sand, there was little left to see.



Shipwrecks

There are numerous shipwrecks to be explored in the waters around Grand Bahama. Some were sunk as the result of storms or ran aground on the coral, and others were sunk intentionally as artificial reefs.

The largest vessel we explored

was called *Theo's* Wreck. Sitting on her port side in 100 feet of water, the adventurous may penetrate *Theo's* hull both at the cargo hold and the engine room. Formerly a 228-foot cement hauler, she was sunk intentionally by UNEXSO in 1982. Working your way down the

In fact, I would bet that most folks who dive this site never even notice the wreck at all. That is primarily because this spot is also called Shark Junction, and divers are usually kneeling in the sand along the edge of the *Pretender*, surrounded by circling Caribbean reef sharks.

Sharks

The shark feeding dive on Grand Bahama is not to be missed. There are a couple of outfits that offer this dive, but I would recommend

Scuba diver hovers over the conning tower of *Theo's* Wreck (above); The *Badger* wreck (left)—this tugboat was intentionally sunk near the site of Papa Doc's Wreck



Caribbean reef sharks swim circles over the sandy bottom

in animals that is often induced by turning an animal onto its back, or in the case of some sharks, by placing one's hands on its snout. The shark becomes rigid, and its breathing becomes steady and relaxed. While in a state of tonic immobility, the feeder is often able to bring the shark over to the guests so that they might touch a shark in the wild. UNEXSO also offers a shark feeder course if you would like to learn to hand feed sharks yourself.

Before and after the shark feeding dive, the crew educates guests on the need to conserve sharks, dispels myths surrounding sharks, describes specifics of shark behavior and explains the dangers sharks currently face from humans.

Scientific studies estimate that humans kill between 26 and 73 million sharks each year, and you will often see that number quoted as high as 100 million

Bahamas



UNEXSO, who pioneered shark feeding on Grand Bahama over 20 years ago. Diving supervisor, Cristina Zenato, has been feeding sharks here since 1995 and was recently inducted into the Women Diving Hall of Fame for her efforts in ocean and shark conservation.

I have never experienced a more peaceful, fascinating and exhilarating dive in my life. A dozen or more Caribbean reef sharks swam slow circles around the feeder and in and around the divers, waiting for their opportunity to be fed. This was not a feeding frenzy where sharks fought one another for food in a cloud of stirred up sand. This was a chance to see these wondrous creatures up close in a carefully controlled encounter, making for an amazing underwater adventure. Never did

I feel threatened or that the sharks were looking at me as food. I had countless sharks pass within inches of me without a hint of aggression. The sharks knew exactly where their food was located, and we humans were simply not on their menu.

During the dive, divers line up shoulder to shoulder, kneeling on the sand in 40 feet of water. Once everyone is in position, the shark feeder approaches, dressed in a chain mail suit and followed by a procession of eager sharks. The feeder then methodically extracts one fish at a time from an enclosed container and hand feeds an individual shark as it passes by. If guests are lucky, they will also get to witness a shark being put into a state of tonic immobility. This is a natural paralysis



Shark feeder, Cristina Zenato, picks up and positions a Caribbean reef shark in a vertical head stand after inducing a state of tonic immobility (above) and surrounded by Caribbean reef sharks in shark feeding dive (left)



Scuba diver in the main cavern of Ben's Cave

Bahamas

cialized cave training, a certified guide and permits. For divers like myself that are not cave certified, there are also a few large caverns at the mouth of these caves in which we were able to dive.

The largest cavern is at the entrance to Ben's Cave, on the eastern side of the island, within the Lucayan National Park. The cave is named after Ben Rose who first dove here in 1967. Ben still lives and works on Grand Bahama and is one of only two people certified to train new guides. (Cristina Zenato is the other.) Accessed by way of a spiral staircase to a long wooden deck below, the cavern is roughly 200 feet long, 100 feet wide and 50 feet deep.

As you descend into the water, the first 25-30 feet consists of crystal clear fresh water. Beneath the fresh water sits a halocline, which is a salinity gradient within a body of water (Wikipedia). Less dense fresh water from the land forms a layer over salt water, which connects through the cave system to the ocean. Passing through the halocline stirs up the salt and fresh water and reduces visibility, so it is imperative to mind your depth. Within the cavern there are large rock boulders that are likely the result of the roof collapse that exposed the



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Opening to Owl's Hole Cave

Wooden boardwalk (left) and spiral staircase inside Ben's Cave

sharks. Most of these sharks have their fins cut off while still alive and are then thrown back into the water to drown. The fins are valued for shark fin soup and command a high price on the black market.

Caverns and caves

Grand Bahama has the second largest underwater cave system in the world, with over 32,000 feet of mapped tunnels. The vast majority of those tunnels require spe-





to the cave system connects to another, called Mermaid's Lair, by way of roughly 3,000 feet of underground tunnels.

Reef

The coral reefs surrounding Grand Bahama Island are colorful, varied and full of life. They play host to large star coral formations, flexible sea rods and vibrant sponges in every color. West Indies spiny lobsters hide under ledges, as do the occasional spotted and green



opening to the cave. There are also huge stalactite and stalagmite formations created over the millennia before the cave was flooded.

Bats nest in the roof of Ben's Cave from the first week of May through the first week of September. In the past, the cave was closed during this time, but is now open to the public year round. The cave system connects underground to another opening within the National Park called Burial Mound Cave. Several Lucayan Indian remains were found, perfectly preserved, under a mound of rocks, in a water-filled cavern near this entrance.

Owl's Hole Cave is another spot with a fairly large cavern at its entrance. This limestone sinkhole is approximately 50 feet in diameter and requires a harrowing 30-foot descent down a vertical steel ladder before hitting the water's surface. Named for the owls that nest on the interior ledges, this entrance



moray eels. Reef fish abound from jacks to groupers, porkfish to squirrel-fish, parrotfish, surgeonfish, filefish, goatfish, grunts and chubs.



CLOCKWISE FROM FAR LEFT: Colony of painted tunicates and mangrove tunicates attached to a sea rod; Longspine squirrelfish on reef; Detail of large colony of great star coral; Large coral head covered with sea rods, sponges, sea fans and great star coral; West Indies spiny lobster



Bahamas



CLOCKWISE: Large red hibiscus flower; Sunbather enjoys a deserted stretch of Gold Rock Beach; Chef makes conch salad, or cerviche, at Junkanoo Beach Club on Taino Beach

Garden eels and jawfish can be found in the sand if you are patient and slow on approach. Unfortunately, the common lionfish, an invasive species in the Caribbean, can also be found here. Native to the Indo-Pacific, they have no natural predators, a voracious appetite and are breeding exponentially. Some of the local dive guides have taken to spear fishing them to help cull their numbers on the reef. I am told that if prepared properly, they are quite delicious to eat as well.

The dive sites around the island are categorized by their depth and degree of difficulty. There are deep-water tongue-and-groove coral formations where you can expect to see sharks, turtles and other pelagic species. Medium depth reef formations, from 40-60 feet, typically consist of scattered coral bommies growing up out of the sandy bottom. Shallow reefs rise from 20

feet nearly to the surface and are perfect for beginner divers.

Topside

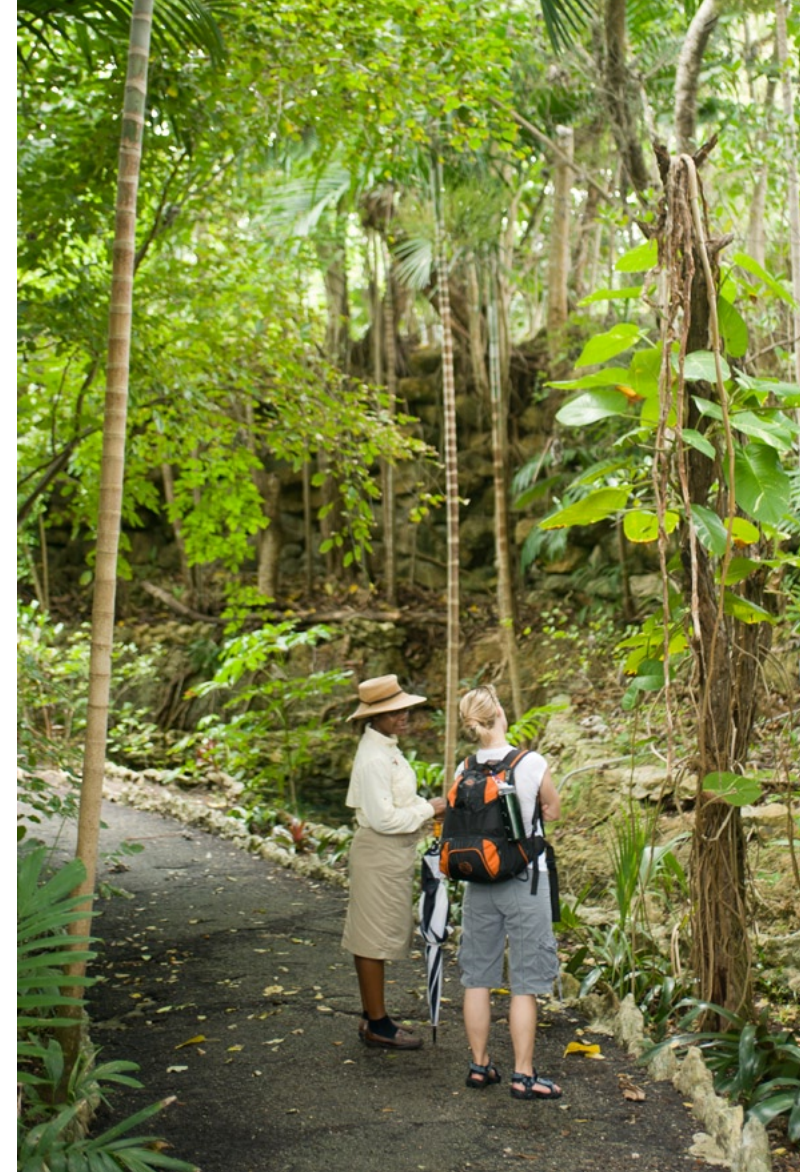
Grand Bahama offers a nearly endless array of non-diving activities to keep you entertained. Sporting pursuits include fishing, golf, tennis, bike riding, sailing, kayaking, horseback riding, windsurfing, parasailing and water skiing. There are casinos, shops, fantastic restaurants, live music and dancing at your fingertips. If that all sounds too hectic, perhaps you would enjoy a quiet stroll along an empty, white sand beach or simply sitting by the pool to soak in the sun.

A must see during your visit is the weekly, Wednesday night, Smith Point Fish Fry. Locals and tourists alike gather at family run restaurants right on the beach to enjoy delicious local fare, dancing and music. Whole fried fish and fried chicken are served with



Wednesday night fish fry at Outriggers Beach Club draws a crowd (above); Colorful entrance to the Port Lucaya Marketplace (top right)





CLOCKWISE FROM LEFT: Waterfall at the Garden of the Groves botanical garden; Red mangrove plants in Gold Rock Creek, Lucayan National Park; Fern Gulley section of the Garden of the Groves; Jeep tour by Grand Bahama Nature Tours; Cuban emerald hummingbird

peas 'n' rice, mac 'n' cheese, potato salad, coleslaw, conch salad and conch fritters. Slug down a Gulley Washer or a Rum Punch afterwards and you have had a night to remember.

A Jeep tour is a great way to see the island of Grand Bahama. Guests drive their own vehicles and follow a guide, caravan style, as they explore some of the beautiful beaches on the south side of the island and learn a bit of history as the guide narrates along the way. Continuing east the tour pass over the Grand Lucayan Waterway on the Casuarina Bridge. At 58 feet tall, the bridge is the second highest point on Grand Bahama and is the only way to get across to the east side of the island.

The Grand Lucayan Waterway is an 8.5 mile long canal that cuts the island in half

and allows small boat traffic easy access from north to south and back again. Construction on the waterway started in 1955, and the bridge was erected ten years later. As the tour proceeds towards the north side of the island, red mangroves and shallow wetlands replace sandy beaches. This area is famous for its bone fishing and is vital as a nursery to many young fish species, in addition to providing protection to the island from storm surge.

Pit stops along the way include the Garden of the Groves, a 12-acre botanical garden featuring lush vegetation, waterfalls and indigenous and migratory birds and wildlife. While strolling through the garden, savor a bite to eat or browse the Garden Shoppes to experience authentic Bahamian arts, crafts and prod-

ucts. Named after Wallace Groves and his wife Georgette, who founded the city of Freeport, the newly renovated garden re-opened in 2008 after sustaining significant damage from two different hurricanes in 2004. The island is nearly covered in Caribbean pine tree forests and they were the original draw for Groves, who settled here to start a lumber company.

Another stop might include the Lucayan National Park and Gold Rock Beach. Here you can examine Ben's Cave on foot, take a kayak tour through the mangroves along Gold Rock Creek or enjoy a quiet lunch on the white sand beach.

If you are interested in a more private and customized tour experience, I would suggest one of the local guides. Several are available, but after repeated local recommendations, I spent a lovely after-





Bahamas



LEFT TO RIGHT: Caribbean pine trees and Sabal palmetto plants line the Old Freetown Road; Little Bahama curly-tailed lizard sunning itself; Cristina Zenato, in a chain mail shark suit, hand feeding a Caribbean reef shark in shark feeding dive; Sunset behind a palmetto palm on the island's West End



been on Grand Bahama for over 45 years.

I look forward to visiting Grand Bahama again soon. There simply was not enough time for all the things I wanted to do on one trip. Numerous dive sites were missed, several wrecks still need to be explored and countless topside adventures have yet to be experienced. Perhaps I will even muster up the

noon with Ms. Paddy Wildgoose. She escorted us on a cultural tour towards the West End of the island, highlighting several of the local communities along the way. Ms Paddy is a wealth of information and a pleasure to be around. Originally from Nassau, she has

courage to hand feed the sharks. Come join me in Grand Bahama for your next dive trip or family vacation. You will thank me if you do. ■

Matthew Meier is an underwater photographer and dive writer based in San Diego, California. To

see more of his work and to order prints, please visit: www.matthewmeierphoto.com

A very special thanks to Cristina Zenato and UNEXSO (www.unexso.com) for providing diving services on this trip; Pelican Bay Hotel (www.pelicanbay-hotel.com) for their superb lodging; and the Bahamas Ministry of Tourism (www.bahamas.com) for providing airfare and coordinating land tours. Thanks to Ed Gates and Grand Bahama Nature Tours (Grandbahama.naturetours.com) for our Jeep tour. And finally thanks to Ms. Paddy Wildgoose at Red Carpet Taxi (paddytaxitour@gmail.com) for the cultural tour and airport shuttles.

Special thanks to Cressi-sub for providing gear used in the production of this article. Visit: www.cressi.it



Common bottlenose dolphins leap out of the water in unison (above); Photographer, Matthew Meier, and UNEXSO Diving Supervisor, Cristina Zenato, in Neptunic shark suits (left). Zenato was recently inducted into the Women Diving Hall of Fame



Cristina Zenato

—Shark Professional, Cave Diving Instructor & Explorer

Born in the Veneto Region of Italy, Zenato grew up in the Congo (formerly Zaire) from the ages of three to 14. She finished high school back in Italy and then went on to Lindau, Germany, to learn the hotel industry. After two years of working for a hotel back in Italy, Zenato's boss forced her to take a vacation. She wanted to go learn to scuba dive and

ended up at UNEXSO on Grand Bahama. After her vacation, Zenato flew back to Italy, quit her job and returned to Grand Bahama 12 days later. She took a job at a local hotel and spent whatever free time she had, six to seven days a week, scuba diving. Within eight months, she became a certified dive master and began work full time at UNEXSO. She has been there ever since.

Zenato's fascination with caves began early in her diving career when she dove the cavern at Ben's Cave, with the caves namesake, Ben Rose, himself. In 1996, she travelled to the United States, to get her cave diving certification. At 24, she was too young to rent a car and had to use borrowed gear, but she managed to go from zero to hero, cavern to full cave, in 14 days.

Not something she recommends for her current students. Zenato started her Cave Diving Instructor training in 2000 and completed it in 2001. In her free time, Zenato maps and explores cave systems to provide vital information used to extend their protection and conservation. Her ongoing project on Grand Bahama has mapped over 32,000 feet of tunnels.

In 1995, Zenato began feed-

ing sharks, and the following year, UNEXSO created a shark feeding class for divers. By 1997, she was teaching the class and slowly putting her mark on how the shark feeding was conducted. The dive has evolved into a more relaxed and controlled encounter as opposed to a frenzied rodeo. Over her career, Zenato has dived with great white sharks, tiger sharks, lemons, bulls, hammerheads, makos, blues, Caribbean reef and nurse sharks. Through the years, Zenato has continually lobbied for their protection and conservation. Thanks in part to her efforts on 5 July 2011, the Bahamas created a sanctuary in the approximately 630,000 km² (243,244 sq mi) of the country's waters to prohibit commercial shark fishing along with the sale, importation and export of shark products.

Text and photo by Matthew Meier

Recently inducted into the Women Divers Hall of Fame for her efforts in shark and ocean conservation, Cristina Zenato has made scuba diving her life since she first got certified in 1994. She is currently the Diving Supervisor for UNEXSO (Underwater Explorers Society) on Grand Bahama Island and has held that position for the last ten years. In addition, Zenato is a full cave instructor and in charge of all technical diving and specialty programs at UNEXSO. Zenato owes her love of the water, at least in part, to her father, Cesare Zenato. He was in the Special Forces as part of the National Association of 'Arditi Incursori' with the Italian Navy.

Due to her incredible versatility and skills working in caves and with sharks, Zenato is in high demand from professional photographers, videographers and TV crews alike. She has worked with the Shark Man, Mike Rutzen, on a film about tonic immobility with sharks. She has helped the BBC, Discovery and National Geographic, collaborated on videos like *Gimme a Hug* and *333 Nina Salerosa* and been featured in *Shark Diver Magazine*.

Zenato has supported professional photographers such as Stephen Frink, Bob Talbot and Todd Essick and also assisted Wes Skiles on his August 2010 National Geographic article on Bahamas Blue Holes.

Zenato is an amazingly accomplished young woman with a very bright future ahead of her. To learn more, please visit her website: www.cristinazenato.com ■

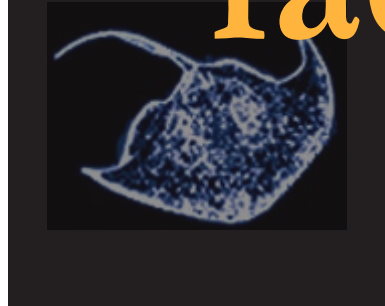


Cesare Zenato



fact file

Bahamas



SOURCE: CIA.GOV WORLD FACTBOOK

History The Spanish gave the island the name Gran Bajamar, meaning "Great Shallows", and what the eventual name of the Bahamas islands as a whole is derived from. The islands were claimed by Great Britain in 1670. Grand Bahama was to remain relatively quiet until the mid-nineteenth century, with only around 200-400 regular inhabitants in the capital, West End. The island finally gained a stable source of income when in 1955 a Virginian financier named Wallace Groves began redevelopment with the Bahamian government to build the city of Freeport under the Hawksbill Creek Agreement and create the Grand Bahama Port Authority.

Geography Grand Bahama Island is approximately 150km (93 mi) long west to east and 20km (12 mi) at its widest point north to south. It has an area of 1,373km² (530.1 sq mi) and is the closest major island to the United States, lying 90km (56 mi) east of the state of Florida.

Climate The Bahamas are slightly cooler than other Caribbean island groups owing to their proximity to the continental North American cold air systems. The subtropical climate sees about 340 sunny days per year. Average air temperatures: Winter and Spring (December to May): 18-25°C / 65-77°F. Summer (June-August): 24-33°C / 75-91°F. Average water temperatures:

Winter (December to March) 24°C / 75°F. Spring 27°C / 80°F. Summer (June to August) 31°C / 88°F. Average water visibility: 24-30 metres / 80-100 feet

Economy The Bahamas is a stable, developing nation with an economy heavily dependent on tourism and offshore banking. Tourism alone accounts for more than 60% of the GDP and directly or indirectly employs 40% of the archipelago's labor force.

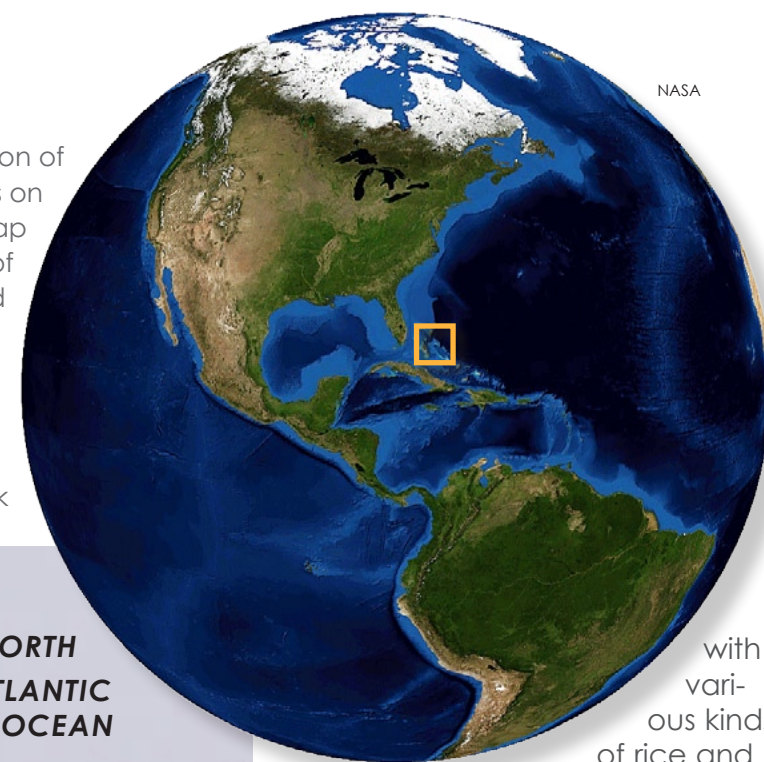
Currency Bahamas Dollar
The Bahamian dollar (B\$) is freely interchanged with the American dollar throughout The Bahamas. It is not necessary to change U.S. dollars into Bahamian currency. Traveler's checks in dollar denominations may be cashed almost anywhere. Credit cards are widely accepted. The Bahamas maintains cordial relations with all international banks and is known internationally for its banking and financial services.

Population Grand Bahamas population is approximately

RIGHT: Location of the Bahamas on global map

BELOW: Location of Grand Bahama Island on map of Bahamas

BOTTOM LEFT AND RIGHT: Diver being kissed by a common bottlenose dolphin; Red mangrove plants in Gold Rock Creek



NASA



75,000 (as of 2007)

Language English

Time Zone Eastern Standard Time prevails on all the islands except during the summer, when Eastern Daylight Savings Time is adopted.

Voltage Electricity in The Bahamas is the North American standard 120 volts at 60 cycles.

Food Grand Bahama offers a wide variety of international cuisines for all tastes. The local Bahamian cuisine consists mainly of seafood, poultry, or pork, typically fried, steamed, or curried,

ent adequate proof of citizenship, such as birth certificate and photo identification.

Telephone From North America, dial 1 + 242 + the seven-digit local number. From elsewhere, dial your country's international direct dialing prefix + 1 + 242 + the seven-digit local number.

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Tipping The usual tip on the islands, similar to the U.S. practice, is 15 percent. Sales tax does not exist in the Bahamas.

Driving British rules apply, so please drive on the left and watch those roundabouts. Visitors may use their home license for up to three months and may also apply for an international driver's license.

Airports/Visa Daily flights are available from Ft. Lauderdale (FLL) and Miami's (MIA) International airports to Grand Bahama International Airport (FPO). Citizens of the United States, Canada and The United Kingdom and Colonies do not need a passport for a visit that does not extend beyond three weeks. Visitors from these areas do need to pres-



turtle tales



Edited by
Bonnie McKenna

Loggerhead
sea turtle



Researchers track marine turtle movements

A team from the University of Exeter in the United Kingdom has monitored the movements, for the first time, of an entire sub-population of loggerhead sea turtles.

The study confirmed that using satellite tracking the day-to-day lives of marine turtles can be monitored and their migrations can be accurately predicted.

The findings reveal that, despite travelling thousands of miles every year, the turtles rarely leave the waters of the United States or the continental shelf. It is this discovery that can directly lead to conservation efforts.

The monitoring project focused on adult females that nest along the coasts of North Carolina and Georgia. It showed that the turtles forage in shallow warm waters off the east coast of the United States. The study also revealed that the turtles traveled as far north as New Jersey, then head south to avoid the cold winter waters.

Dr Lucy Hawkes, who participated in the study, said, "This is the first time, to our knowledge, that anyone has been able to say precisely where and when you would find an entire sub-population of marine turtles. This is incredibly useful for

conservation as it tells us exactly where to put our efforts. We knew that satellite tracking was a valuable tool, but this study highlights how powerful it is...without it we would still be guessing where these beautiful but vulnerable creatures live."

Dr Brenden Godley who led the team has been using satellite tracking to monitor sea turtles since 1977 said, "These findings form a valuable resource for conservation groups who are concerned with protecting turtles from threats posed by fishing, pollution and climate change." ■

Sea turtle dies after swallowing 317 pieces of plastic

A dead green sea turtle that washed up on the shores of New South Wales, Australia, earlier this month was found to have hundreds of

piec-

es of

plastic in its digestive tract. Plastic bags, small lids and even lollipop sticks were among the 317 pieces of plastic removed from the turtle.

Rochelle Ferris and her team of volunteers at Australian Seabird Rescue said that this was the worst case she has seen in 15 years.

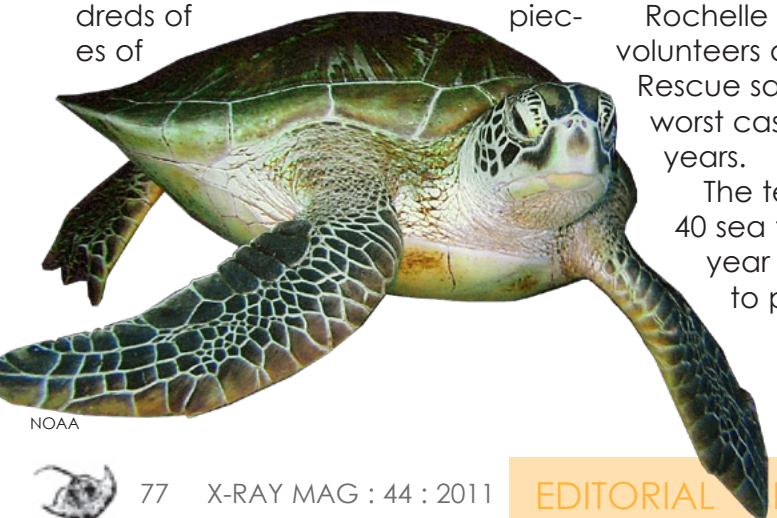
The team responds to about 40 sea turtle strandings each year that are directly related to plastic ingestion.

A recent study by the

University of Queensland said that approximately 36 percent of sea turtles are affected by marine debris, such as plastic.

The death of this turtle demonstrates the negative impact we have on our ocean friends. Remember the three Rs: Reduce, Reuse, Recycle.

To watch Ferris discuss the incident as well as larger issues, go to: www.abc.net.au/local/videos/2011/06/30/3257970.htm?site=northcoast. ■



Green sea turtle




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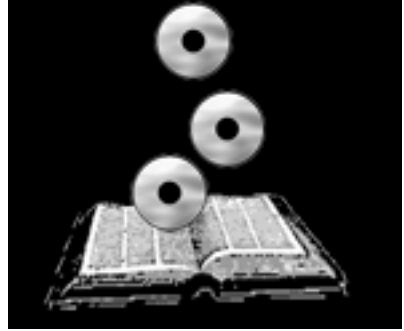
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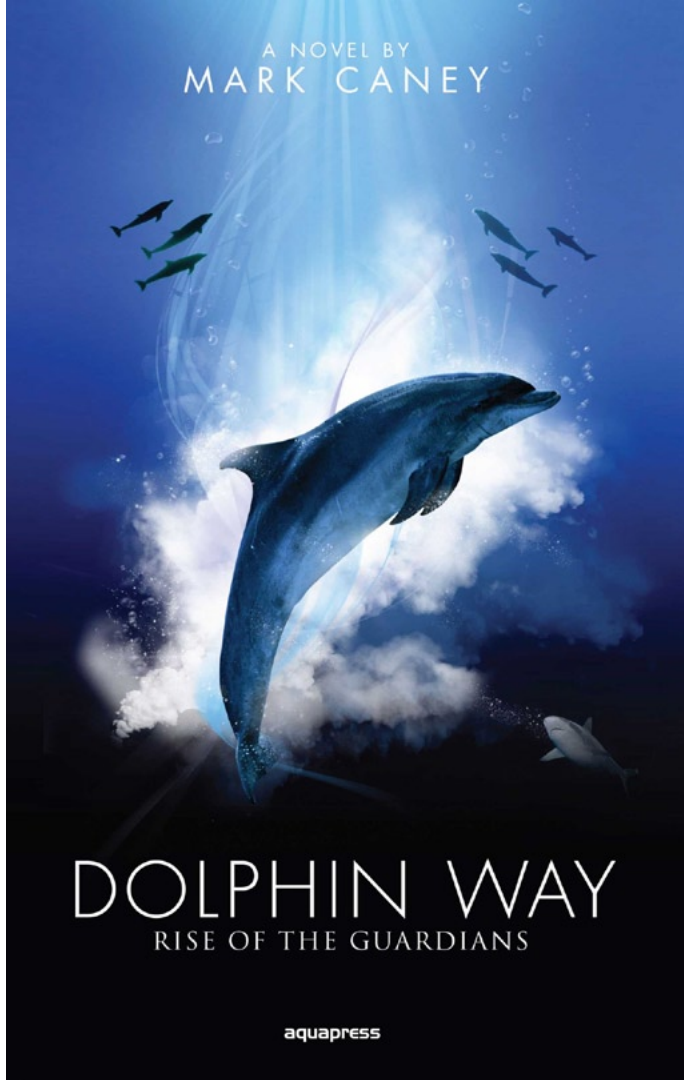
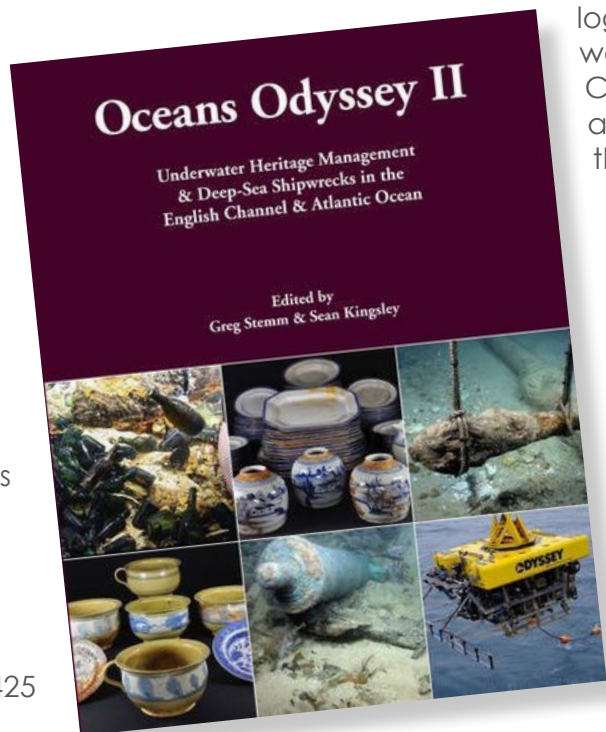


Oceans Odyssey 2

—Underwater Heritage Management and Deep-Sea Shipwrecks in the English Channel and Atlantic Ocean
 Edited by Greg Stemm and Sean Kingsley

Oceans Odyssey 2 includes archaeological and historical information about the advanced technology and methodology used by Odyssey to discover 17th-19th century shipwrecks such as the Royal Navy First Rate warship Balchin's Victory, a mid-17th century merchantman carrying elephant tusks, the mid-18th century French privateer La Marquise de Tourny, and the mid-19th century US schooner Jacksonville "Blue China" wreck. Several papers in the new book explore the artifact collections found on these sites, detailing their significance in history. Odyssey's extensive research, documentation and publications have helped answer questions such as why certain ships sank and the commercial background of the cargos aboard these ships.

Hardcover: 282 pages
 Publisher: Oxbow Books
 (August 30, 2011)
 Language: English
 ISBN-10: 1842174428
 ISBN-13: 978-1842174425



Dolphin Way

Author: Mark Caney

Dolphin Way (www.facebook.com/DolphinWay) is set in a World that is rich in detail and history, where dolphins have followed their own belief system (the Way) for thousands of years. The Way is a cross between a religion and a philosophy, where dolphins live in harmony with Ocean, their name for planet Earth. But in recent years the dolphins have observed the concord has changed, and there are sinister consequences. One of the dolphins -Touches The Sky - finds himself caught up in trying to stop this perfect world unravelling and as result

has to face the worst punishment his clan can inflict. As his life deteriorates he is unwillingly forced into a situation where he alone can stop the dolphins' utopia from falling apart and save the one he loves. To get your hands on this first edition of 'Dolphin Way' (£12.99, ISBN: 978-1-90549-223-7) log onto Amazon, AquaPress' website or buy it direct from www.dolphin-way.com/the-book/ and find out for yourself why the Whale & Dolphin Conservation Society stated that this is "a superbly plotted, accomplished and entertaining novel, with a powerful environmental message, describing the intolerable pressure from man's destruction of the dolphin's world".

Pearls of the Caribbean HD

Diving guide and travel companion to three very different Caribbean destinations made my X-Ray contributor Steve Jones:

According to its description on iTunes it's yo-ho-ho and a bottle of rum as this app takes you on a journey both above and below water through three of the Caribbean's finest destinations: Dominica, St Lucia and St Vincent. It's not by chance that the producers of the Pirates of the Caribbean movies chose these destinations as filming locations, yet the real treasures here are to be found beneath the waves. This application is a companion aimed at scuba divers but will also be of use to those that prefer to stay on dry land. It provides important information on dive centers, dive sites, weather conditions, as well as all the local information you need to ensure you make the right choices.

itunes.apple.com

Demon Fish

—Travels Through the Hidden World of Sharks
 Author: Juliet Eilperin

A group of traders huddles around a pile of dried shark fins on a gleaming white floor in Hong Kong. A Papua New Guinean elder shoves off in his hand-carved canoe, ready to summon a shark with ancient magic. A scientist finds a rare shark in Indonesia and forges a deal with villagers so it and other species can survive.

In this eye-opening adventure that spans the globe, Juliet Eilperin investigates the fascinating ways different individuals and cultures relate to the ocean's top predator. Along the way, she reminds us why, after millions of years, sharks remain among nature's most awe-inspiring creatures.

From Belize to South Africa, from Shanghai to Bimini, we see that sharks are still the object of an obsession that may eventually lead to their extinction. This is why movie stars and professional athletes go shark hunting in Miami and why shark's fin soup remains a coveted status symbol in China. Yet we also see glimpses of how people and sharks can exist alongside one another: surfers tolerating their presence off



Cape Town and ecotourists swimming with sharks that locals in the Yucatán no longer have to hunt.

With a reporter's instinct for a good story and a scientist's curiosity, Eilperin offers us an up-close understanding of these extraordinary, mysterious creatures in the most entertaining and illuminating shark encounter you're likely to find outside a steel cage.

Hardcover: 320 pages
 Publisher: Pantheon
 Language: English
 ISBN-10: 0375425128
 ISBN-13: 978-0375425127



Wolfgang Leander

Text by Arnold Weisz
Photos courtesy of Wolfgang Leander

Sharkman Wolfgang Leander has taken on legendary status in the diving world with his intimate work with sharks of all kinds. X-RAY MAG's Arnold Weisz talks with the conservationist to find out the story behind the legend.

captions this page...



WL: No, they are not. However, sharks are wild animals and should be treated with much respect. Even harmless shark accidents typically get a media coverage that is way out of perspective. So, many people still believe that sharks are out to attack people indiscriminately. That, of course, is not the case at all. I do feel quite relaxed and comfortable swimming with a "pack" of large sharks commonly, and wrongly, referred to as "man-eaters" Humans are not on the

but intuitively I believe to have some sensitivity for animals. I was, and am, always circumspect in the presence of sharks, and I observe their body language in different circumstances keenly. Sharks are normally shy animals, and they all have their own personalities as is the case with any other animals. You have to know that. With the first hand knowledge I have acquired over the years, I can tell in what mood a shark is. Few are bold or you might even say aggressive; that, however, very much depends on circumstances. In general, sharks are quite predictable - but you have to know their behavior intimately.

How can you learn that? It's rather easy. Sharks have a distinctive body-language; you have to learn it pretty much like any other foreign language, except that you don't have to struggle with grammar, syntax, and other linguistic requirements. One talent in learning shark body language is, however, crucial: You have to have a sharp and deductive sense of observation.

AW: You freedive rather than scuba dive. What is the reason for this?

menu of sharks, Contrary to the widely accepted belief, they are not attracted by human blood. So, if you bleed underwater, and sharks are around, you have nothing to fear: your blood will not incite them to bite you

AW: Tell us a bit more about your learning experience swimming with sharks.

WL: I am not a shark behaviorist

AW: How did it all start?

WL: Almost 65 years ago when I was six and saw the first images of adventurous helmet divers and what was then considered "monsters" of the deep: Sharks, killer whales, giant squids. My passion for the submarine world has not diminished, it was transformed with the passage of time. I guess my relationship with the Big Blue always reflected the

prevailing zeitgeist vis-a-vis the oceans, as it were: In the fifties and sixties, for example, the abundance of marine life seemed to be as endless as the surface of the seven seas. Nobody would have imagined that overfishing and pollution could ever become an issue of concern.

I started diving at age fourteen as a spearfisherman, and would catch almost anything that moved. Mind you: I don't feel

bad about it in retrospect as all diving pioneers did the same thing. Hans Hass, for instance, would spear moray-eels, rays, and nurse sharks for the heck of it. Today, I share the preoccupation of most experts about the health of the oceans that is at risk. Take sharks: Before getting to know them from personal experience, and realizing that their true nature has nothing to do with the way they have been, and

unfortunately, are still being portrayed, I considered them to be "dangerous" like everybody else and would have killed them with a powerhead, or bang-stick, without remorse. Now, I would not allow anyone in my presence to be rough to a shark, let alone kill it.

AW: Would you then say that sharks are not dangerous predators, not even potentially?

Leander



WL: Everybody asks me this question, understandably so, when it seems to be logical to scuba dive as it allows you to stay down, deep and long. My answer is simple: I don't like having cumbersome equipment on my body; it makes me feel as a stranger in the underwater world. I rather hold my breath than breathing underwater. Depending on the technique you apply, you can have the sensation of being slightly intoxicated by a rush of euphoria not comparable to any other "good" feeling. And I am

not talking about free-diving as an extreme sport.

I freedive because it gives me the feeling of freedom; it is a mental exercise more than a physical challenge. Philosophically speaking, freediving allows me to feel one with nature much more intensely than being on land which is my habitat. There is also a practical reason that speaks for freediving: Freedivers find it normally easier to get close to, and interact with, large animals than scuba divers. I have dived only four times with tanks

back in the sixties - didn't find it appealing. I began to dive as a freediver, and I will end my life as a freediver.

AW: What was your first close encounter in open water with a big shark like?

WL: Believe it or not, I wasn't terrified or anything like that as I didn't feel threatened despite all we knew in those days about sharks. I was spearfishing in the British Virgin Islands, in the fall of 1968, all by myself which is what I

always do, when I saw this mighty 12 ft shark swimming by about 12-15ft below me. I was going down to target a nicely sized mackerel with my gun, and as the shark suddenly appeared in my field of vision, I stopped moving so as to not get it interested in me. From the way it swam I immediately realized that the shark didn't mind my presence at all. I was relieved but as you can imagine, I was totally captivated by the sight of that huge shark, and just marveled at it as it slowly vanished into the blueish mist.

the paradigm of evolution; no other highly developed species in our planet has survived more than 400 millions of years. Sharks remind us that we are late comers, and that we should not take ourselves too seriously. I guess that I also feel, perhaps a bit morbidly, attracted to them because of the excitement of facing an animal that could, technically, devour you. To be eaten alive by a wild animal was a real threat in the dawn of human pre-history.

I am convinced that we carry this deep-seated fear in our

The shark did not come back; I was glad but at the same time I wished it would have returned... I relived this brief encounter before going to sleep that night over and over again, as if to try to preserve that magic moment I had waited so long for it to finally happen.

AW: What is it, deep down, that fascinates you about these animals (sharks)?

WL: Deep down? Hmm. Let me think..... I'd say it's a combination of several factors: it's the knowledge that sharks are very ancient, and at the same time contemporary creatures that have adapted to their environment in a most extraordinary manner; you could say they are

genes, a fear that is archaic but quite real in the sense that we are not only relentless conquerors of the unknown but at the same time fearful or at least apprehensive of the dangers that lurk behind the horizon or in the depths of the oceans. There are many, many people who feel something similar about sharks but find it difficult, as I do, to describe. These creatures somehow seem to touch very deep layers of our own evolutionary make-up. I don't know.... Does this make any sense to you?

AW: I guess it does.... Let us touch a rather touchy subject. Some animal activists think it is wrong to touch or feed wild animals. We know you do it. Can you tell us why?

WL: I am glad you broached the subject as I am fully aware it is a controversial one. To begin with, I like to touch people I like, and the same goes for animals. It is not an unusual sight to see me petting a stray dog in the streets of my hometown Cochabamba. I don't think an animal protector would criticize me for expressing my feelings for a creature physically. I pet sharks because I like them, I have also petted octopuses, as gently as I would pet my grandson Wolfie. Octopuses are, by the way, most tender, playful, and intelligent animals. Once you get to know them it is hard not to fall in love with them.

Animals in general, wild and domesticated, are very sensitive and responsive to physical contact. I see nothing wrong with touching a shark if you do it gently. As long as you don't hurt

the shark, or scare it deliberately by being rough, you do not harm it. If others think differently, well, that's their view. To me his is not a matter of ethics, as some animal protectors would claim, but a personal decision to express affection. The same is true of feeding. I don't see what could be wrong feeding a shark? Because you risk being nipped? Or because it could alter their feeding habits – which, by the way, has yet to be proven. Well, again, the choice is yours.

I do not encourage others to pet a shark – I have had a long training interacting with sharks, and began touching them as I got to know them better and better. Thus, I do not consider it to be risky at all. However, I won't put on underwater rodeo shows as some do, also I don't want to demonstrate how "macho" I am interacting closely with sharks. If I want to prove anything at all, it is to show that sharks are amenable animals, and definitely not aggressive toward humans.

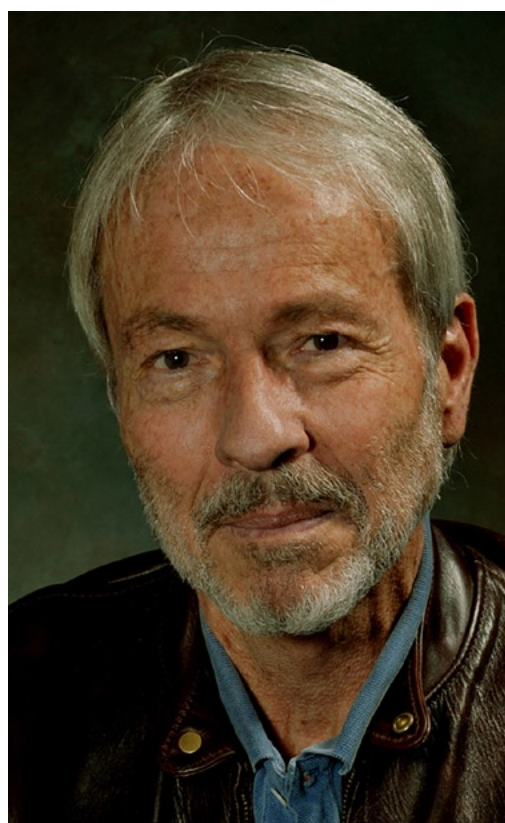
AW: Shark diving has become a popular «product» offered by many dive centers around the world. What are your reflections around this?

WL: There is absolutely nothing wrong with that. Quite the contrary. Sharks are still shrouded in an aura of mystery. Shark diving has turned countless divers into informed individuals with a new, caring outlook on sharks. I am very pleased to see that more and more people dive with sharks and, thus, find out for themselves how incredibly beautiful and vulnerable these animals are. Although there is a growing

awareness of the tremendous pressure many sharks species are exposed to due to overfishing, we need more shark ambassadors to actively engage in conservation matters.

AW: It seems that shark protection is getting more traction even within political establishments, and more and more countries are taking measures to save these animals from extinction. Why do you think it is so difficult to protect sharks?

WL: As in other complex situations, especially when they have a global dimension, there are too many conflicting interests to provide you with an easy answer. I can only highlight some of the problems concerning this issue. Shark fishing, uncontrolled as it is, is a huge business world-wide. Sharks are being killed to a very large extent for their fins to satisfy the growing demand for shark



fin soup, as you know. By now it is general knowledge amongst politicians that the populations of many shark species are extremely vulnerable to overfishing. Why? Basically because sharks mature slowly, and give birth to only a few young at a time.

Tens of millions of sharks are being killed every year, and in many countries the sharks being "harvested" for human consumption are getting smaller and smaller, long before they reach sexual maturity. It is not difficult to imagine how negatively this will affect the populations of sharks. It is also common knowledge that sharks play a vital role in maintaining the balance of life in the oceans.

The chain of marine life depends on healthy shark populations. To picture that far too many shark species are in rapid decline, some of them already facing extinction – so some gourmets in China and other Asian countries can savor a bowl of shark fin soup every now and then is just mind boggling!!

You would think that in view of such a catastrophic scenario it should be easy to simply ban shark fishing to save the sharks from being massacred for the least nutritious of their body parts. Well, it is not: You have the fishing industry lobbyists, you have the mighty shark fin mafia, not much less criminal than the drug cartels, you have the politicians who feel that they have to be responsive to

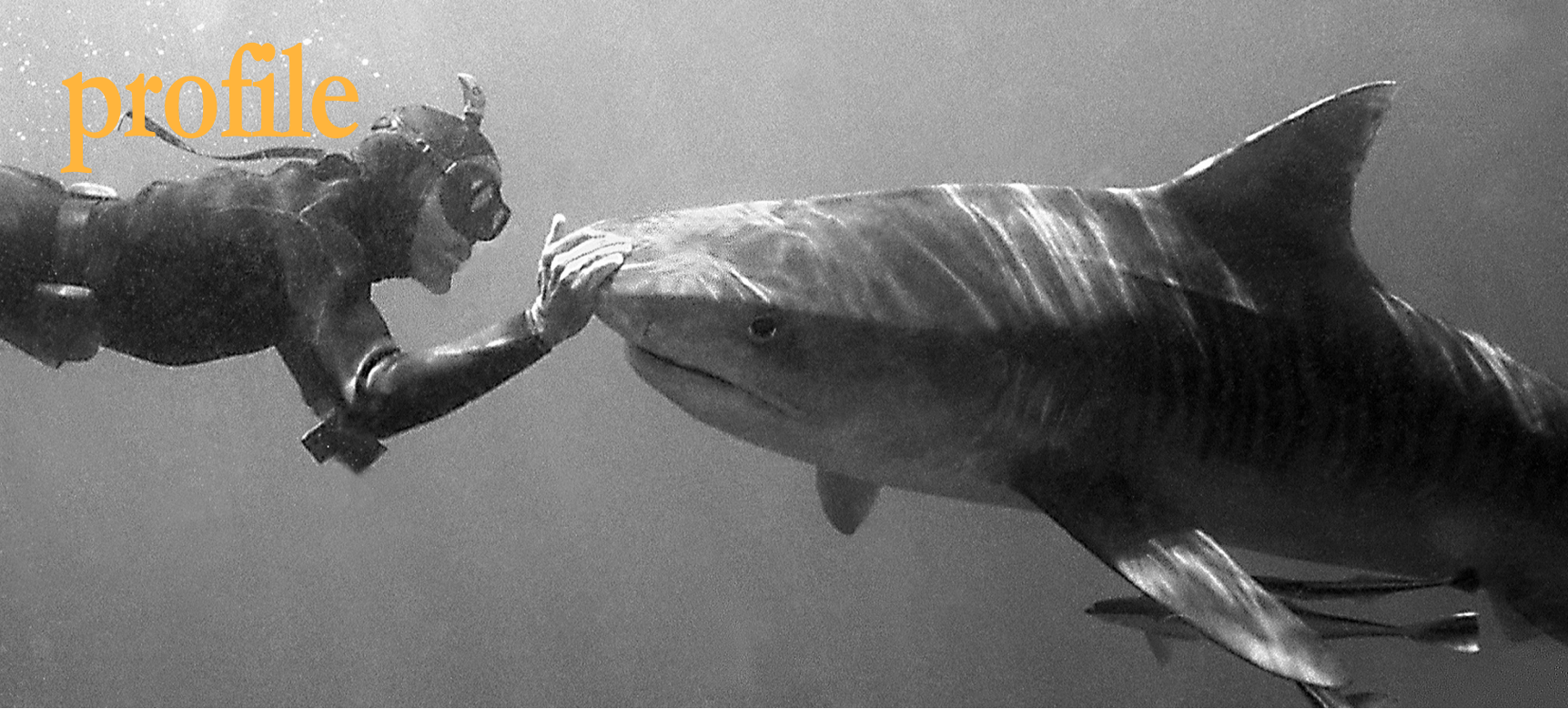
their constituencies, among them big business and conservationists; and you have a lot of corruption, mainly in the poorer maritime countries.

AW: Talking about non-profit conservation groups – what about them? Are they powerful enough to bring about the desired changes in shark protection?

WL: Unfortunately, some of these non-governmental organizations have become quite "political", as it were. I will restrain myself from getting too specific, but what I could see during the last years has been somewhat sobering, to put it mildly. With some exceptions, the shark conservation community,

if I could call it a 'community', has degraded itself to some sort of a "vanity fair". As my son Felix put it recently, photographers, videographers, scientists, non-profits, activists, and the hundreds of online groups that have sprung up are often driven by rather egotistical motives. There is, according to Felix, a lack of togetherness because too many individuals want credit – they want credit for bringing the media's attention to something, changing a law, getting a grant, and so forth.

Many people have their own agendas and are just using the sharks and their misfortune as an opportunity to springboard themselves to "fame". I believe



of shark fin soup amounts to preserving cultural values which is an absolutely ludicrous contention that shouldn't be even discussed.

AW: One last question - which is your preferred shark dive spot?

WL: Definitely Tiger Beach in the Bahamas! This is a place where diving conditions are absolutely ideal: Stunning visibility, plenty of sharks, docile and friendly lemon sharks, and,

of course, the truly impressive tiger sharks, forceful, elegant, extremely gentle - all in rather shallow water. The sandy bottom which is a perfect backdrop for stunning images and video sequences makes artificial lights, even flashlights, almost superfluous, such is the incredible illumination that is the trade-mark of that place. I have been diving there at least once a year since March 2007 - and will keep going back, no question about it.

In fact, you will find me at Tiger Beach during the first two weeks of November, on-board the Dolphin Dream. I believe the travel arranger, Dominique Macan of DiveAdvice, has still two or three open spots. If your readers want to check the availability, and dive with tiger sharks and some very cool people from many different countries, here is the link: http://www.diveadvice.com/Tiger_Shark_Diving.htm

Felix is right. I have once asked an internationally well-known videographer and author why he got interested in sharks. His answer was as telling as it was disarmingly honest: "Because sharks sell". I have seen him diving with sharks, and could see from the way he interacted with them that he had no feeling whatsoever for them. If everyone's agenda was to save sharks, sharks would be safer today.

To be fair, there are very efficient and professional shark conservation groups that work behind the scenes as inconspicuously as possible with remarkable results. The Bahamas have recently enacted a total ban on shark fishing. Two conservation organizations, one local, the other international, were instrumental in working actively with members of the Bahamian government for their parliament to declare the archipelago a shark sanctuary. The fact that other maritime nations have also moved decisively to protect their sharks shows that the work of shark conservation groups which were

behind these initiatives can be highly effective in bringing about the changes that are essential for the survival and preservation of sharks.

AW: You have been involved with many campaigns against shark finning and protection again sharks. In these years we see how more and more states are banning shark fin products and practices, and traders too. I presume one of the more spectacular victories must have been when the giant chinese owned trading portal alibaba.com finally succumbed to the pressure and forbade shark fin products on their portal.

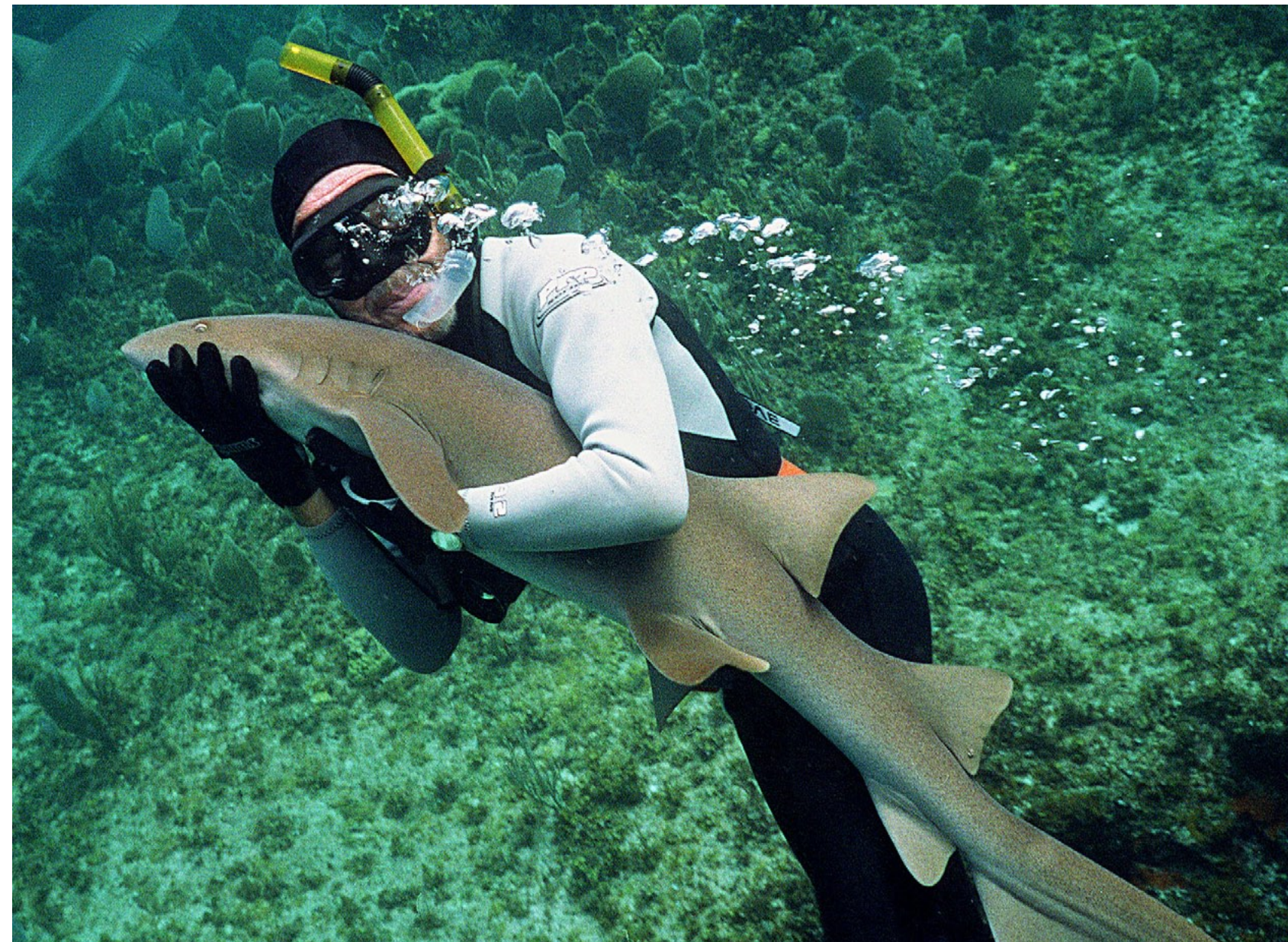
What do you consider the biggest victory and what is the biggest challenge lying ahead?

WL: You know, positive outcomes in shark conservation, victories as you call them, are always a result of team work and cooperation. If you have committed people trying to make a difference, and if they are ready to leave personal agendas behind, putting the sharks first instead of self-

promotion, as I said rather common tendencies in the shark conservation "business" as I call it, I cannot think of "a" biggest victory. I see many.

You mentioned that there is an ever growing number of countries that now fully protect their sharks. That is extremely encouraging as I believe it will have a contagious effect all over the globe. The biggest challenges lying ahead are to achieve an international agreement to extend the protection of sharks beyond the territorial boundaries of the maritime nations, and to further enlighten the people about the important role of robust shark populations in maintaining the oceans healthy.

In my view, one of the most urgent goals is to bring the educated Chinese into the conservation boat. Some conservation groups are already working on it, quite successfully as I understand. I am absolutely sure that the younger generation in China will eventually be on our side, and will challenge those reactionary traditionalists that maintain that the consumption





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—A Personal View

Deep D(r)iving Motivations

Text by Wes Skiles

Every time I think of deep diving, both good and bad memories surface together in my mind. I can recall those exciting evenings over 15 years ago when my friends and I would drive from Jacksonville to Eagle's Nest just for an evening dive. We were full of anticipation back then for the promise each dive held. Among other things, these dives offered the challenge of testing ourselves against narcosis, which we viewed as an obstacle to be overcome, so that we could be "good deep divers". Mastering the depths was extremely satisfying to my ego.

I must admit that I enjoyed the sensation of narcosis, but the real reason I was there was to develop my skill as a deep diver. For some unknown reason, I just had to be able to say that I had been

deep on air. I only wish that I could have known back then the scenarios that were rushing full speed towards me and the consequences of my misdirected actions.

One of the most common reasons people experiment with deep diving is to see how they handle narcosis. Invariably, they share these experiences with their diving peers, but more often than not they hold some of the truth back about how they reacted to the depth; either they do not want to admit that they experienced any level of narcosis, or they want to give the impression that they "overcame it" and "kept it under control".

I am sure that there are a few divers that can be completely honest and objective about their experiences. But most of us would have to admit that we have been a little more *narced* than we were willing to let on to our companions at the time. This situation is not helped any by the existence of those anomalous divers who seem to have total immunity to the effects of narcosis. Unfortunately, these unusual individuals—along with others who simply deny feeling any effects—set the standard for the mass of divers interested in quantifying their capacity to dive deep.

It was hard to admit at the time, but my first face-slammung experience with narcosis occurred at just 160ft. I was crushed—demoralized. I knew that experience and repetition would help get me deeper, but how was I to get that experience if I admitted to anyone that I got narced at 160ft? Eventually, after about 20 dives, I had worked my way well past 200ft. I was finally the victor; I had beaten narcosis—or so I thought.

At this point, let me pose the same questions I ultimately had to ask myself: What is the point? Why would you want to go that deep on air? What purpose is served beyond the excitement of the moment? To my mind, if you don't have a really solid justification and you are doing it for the challenge alone, then it becomes just another cheap thrill. Only not so cheap.

Deep diving on air
Deep diving on air must be approached with a strong sense of the possibilities of uncontrollable circumstances and negative outcomes. Our dive plan that day was to descend to a depth of 165ft, and then to explore a virgin cave passage downstream. The depth and distance we would both be travelling downstream with the current before turning

the dive and exiting against the current were accounted for by our use of a conservative 1/5-air rule, that is, we would begin our return when we had used 1/5 of our air supply. This dive would require an additional stage bottle, as well as oxygen for decompression. Certified cave divers, we descended on our adventure.

The dive proceeded as planned, with the new passage being explored and survey data collected. When the allotted air was consumed, we began our return trip, having spent considerable time already at the 170-ft level. We gave each other the double-time signal, which meant we would pick up the pace during our exit. Retrieving stage bottles on the way, we prepared for our final exit from the cave.

Seconds later my partner signaled me, indicating that he felt so-so. Although

I did not comprehend the scope of his problem, I realized that we had better slow down. Then, swimming only a few feet further, I turned to see my friend losing consciousness. My mind raced, with heartbeat and breathing following, as the full impact of the situation hit me. Fortunately, he was still breathing and not yet fully blacked out, but there was no way he was going to be able to get out on his own.

Grabbing him by the arm and pulling him over my shoulder like a sack of potatoes, I began a desperate swim for the exit. Less than a hundred feet later, my





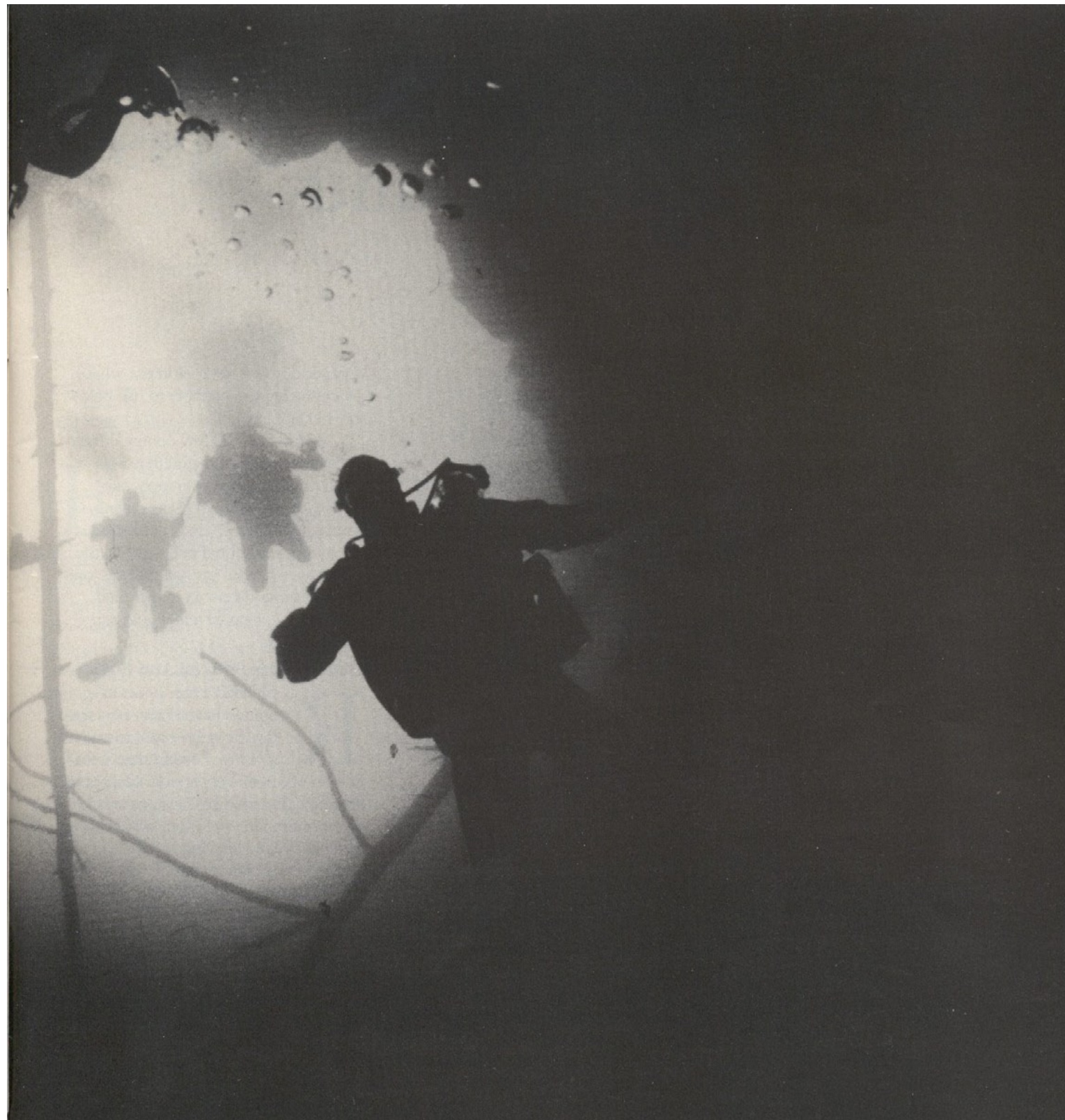
body began to succumb to the stress, my brain pounding like tribal death drums. I clearly remember a flash of regrets—not the kind people supposedly have before they die, but much more pragmatic thoughts. Why didn't I realize that this could have happened? Why was doing this dive so important?

By the time I got to deals and promises with God (I will never do this again, really...) I regained control of my runaway breathing. Reorganizing my thoughts, I got underway at a pace I hoped would keep us both alive. It was still a touch-and-go exit, but both of us survived.

What went wrong

An analysis of our situation pointed to a combination of CO₂ buildup and narcosis—a very real problem that is often ignored by air-breathing deep divers. Our own level of difficulty with this problem could only have been amplified at a greater depth. I ask the air-breathing, deep-diving readers if they are confident of their own abilities to handle a sudden injection of mental and physical stress at depth. If the answer is a smug “yes,” how do you know that?

Instead of modifying my dive habits after this incident, I continued to deep dive. Having been the “victor” of that round—at least in my mind—my response was to change buddies and stick with the “challenge” of deep diving. I was in control. An upcoming scenario



featuring me as the victim was unthinkable.

Deep diving ego syndrome

These experiences played out in the late '70s, when many large, deep cave systems still remained virtually unexplored. I believe my

personal motivation at the time was simply to explore deep caves. In retrospect, exploration imperatives were probably only 20 percent of that motivation; I will now admit that the other 80 percent was what I call “deep diving ego syndrome”.

It was on one of my deepest dives, as part of a three-person team exploring a deep tunnel, that things caught up with me. On two previous dives here I had led the team, so on this third dive I was to be along “for the ride”. Relaxed, confident and without

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the responsibilities of leading, I was unconsciously lowering my guard.

The descent and dive went smoothly with the exception of a couple of minor communication glitches. I was surprised at how far we were getting, and that my buddies had not yet hit their air turn-around point. I called the dive on air and gave the thumbs-up, confident that the others would be ready to turn also. That is when the horror of a narcosis-clogged challenged whatever senses I had left.

As I turned to begin our exit out, the others flashed me with their lights, the beam sweeps an imparting sense of urgency. Spinning about in response to a possible emergency, I now faced my buddies who were signaling emphatically that the surface was in the direction we had been swimming. This meant that either I



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Deep Diving

it? Or were my trusted buddies mentally blind with narcosis? This 50/50, coin-toss moment of decision nearly caused me to pass out from the rapid dump of adrenaline entering my system. But it was two against one. Being not sure but shaken, I decided to give in. Either they would lead us to our doom or to dinner. I simply followed them, not at all sure of who knew what.

The gravity of that error ended my misdirected, ego-driven deep dives

had gotten confused or the both of them had.

Had we turned the dive and begun the exit without my noticing

on compressed air, which, up until that time, had seemed so very important. From that experience, along with a few other not-quite-

so-close calls, I began to reassess the reasons that others and I had used to justify a deep dive on air.

Mixed-gas sport diving

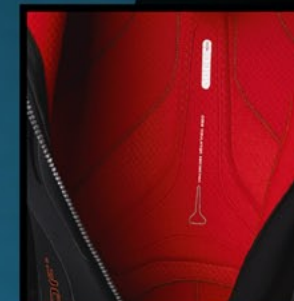
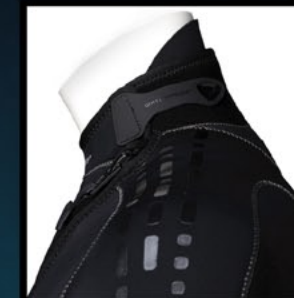
Many years have passed since my "air-powered" deep-diving days. Now my friends will tell you that I am reluctant to dive below 130ft without the benefit of a gas mix. I have come to feel that there is nothing down deep worth visiting while on air. It is just not worth the risk, especially with the advent of mixed-gas sport diving techniques, equipment and table, and with one-atmosphere suits on the horizon.

A wise old diver once told me, "If you stick around long enough, you will see the whole show repeat itself time and time again." I have been around long enough now to agree with him, having seen the loss of a few divers—some really good ones among them—as the show gets replayed.

Deep diving on air never offers a guaranteed safe return, no matter what your reason and confidence tell you. I constantly hear people say, "Boy, that person is a real good deep diver." I now know there is no such thing as getting "good" at deep diving on air. While a person may be truly competent, trusted and liked, their competency will only allow them to be lucky when diving deep. ■

Veteran explorer, filmmaker and photographer Wes Skiles died during a working dive for National Geographic in 2010.

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Grey reef shark

Using state-of-the-art “internal tags” with a battery life of more than ten years, scientists in Palau are breaking new ground in studying the long-term behavior of individual sharks. Peter Verhoog and Georgina Wiersma went along to document exactly how sharks are caught, tagged, and released. And also discovered, how important divers can be in shark conservation.

Text and topside photography courtesy of Save Our Seas Foundation and Georgina Wiersma

Underwater photography courtesy of Save Our Seas Foundation and Peter Verhoog

The Micronesian Shark Foundation has now been tagging grey reef sharks for over two years. The Save Our Seas Foundation supported shark tagging program includes tagging of sharks with acoustic and satellite tags, deploying acoustic loggers around Palau's reefs

and collecting measurements and DNA samples from tagged sharks. Further information is obtained through DNA samples from confiscated shark fins. These samples are analyzed in the Save Our Seas Shark Centre in Florida.

Speedy procedure

But how are sharks tagged? Save Our Seas Foundation CEOs Peter Verhoog and Georgina Wiersma had the privilege to board a ‘tagging boat’, together with Dr Mark Meekan and his research assistants. To be able to tag them, sharks

have to be caught with a line and blunt hook and taken aboard the boat. All sharks in Palau have ‘internal tags’. This means, that the tags are inserted in the shark’s body through a small cut after injection of an anaesthetic fluid. When the tag is inserted, the wound is

closed again and the shark is released. The whole process lasts around eight to nine minutes. Following the process is really exciting; the moment that the shark is caught, Peter jumps into the water to take pictures, while I stay on the boat. Dive master, Angelo, is our

Tagging Sharks in Palau



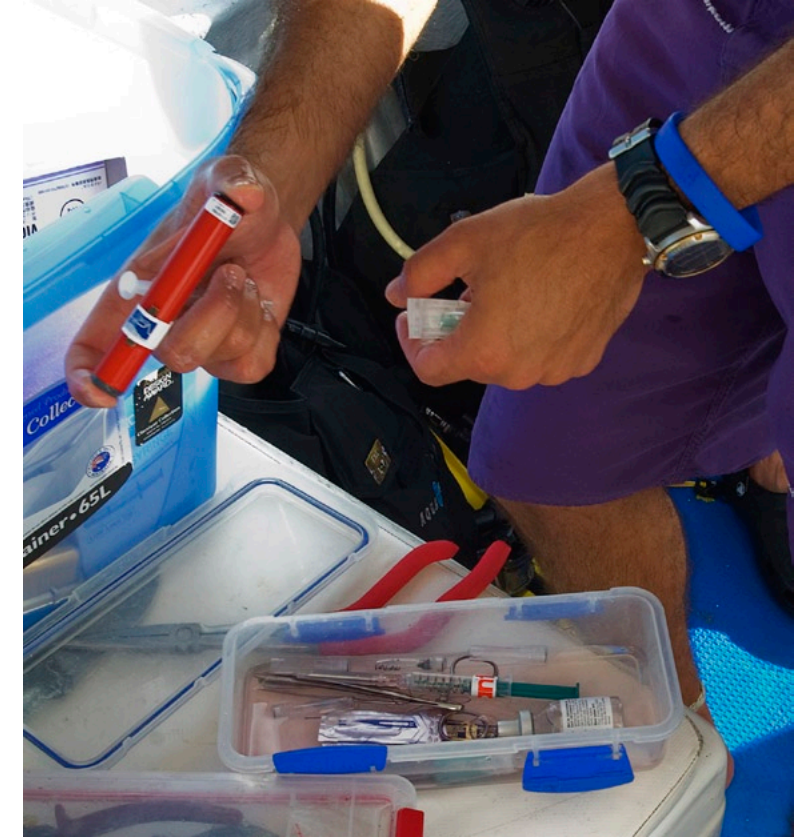
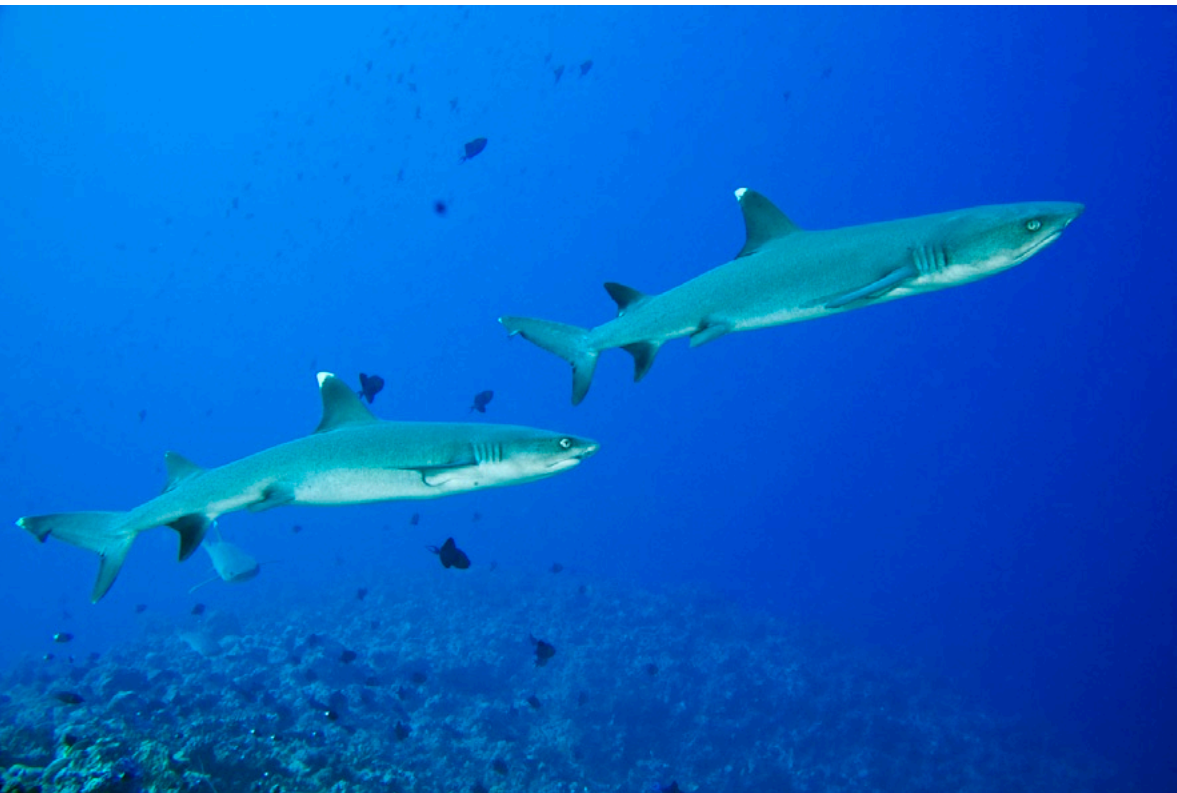


shark tales

Whitetip reef sharks (below) are also tagged

The caught shark is carefully pulled onto the stretcher (bottom left)

Keeping the oxygen flowing (right)



official shark wrestler; he is the only one able to hold a grey reef shark down. The shark is obviously not too pleased with our actions, and the only way it can defend itself is of course by biting. The razor-sharp teeth get much too close for comfort. Once Angelo has turned the shark on its back, it calms down.

episode of ER, from pulling the shark onto the stretcher until the moment the patient is released into the water again!

The Micronesian Shark Foundation can now use state-of-the-art new tags, with a battery life of over ten years. A big improvement, as the old tags gave up after three years.



Keeping the oxygen flowing

Another crew member inserts a tube with running seawater into the shark's mouth, to give it the essential oxygen through its gills. PhD student, Gabriel, makes the cut, and Meekan jots down all the data: size, sex, number of the tag. Nearly all caught sharks are female. While Peter does the job under the surface, I climb around the boat to document everything topside; I have been warned that I must use every opportunity. There will be no waiting until I have taken my shots. Everyone wants the shark back in the water at high speeds. It's all like watching a sharky

The importance of the diving community

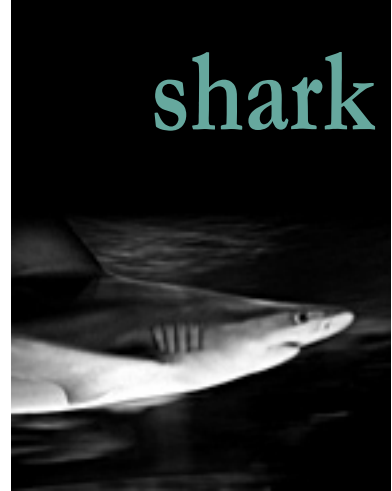
Project leader, Tova Harel of Fish 'n Fins in Palau, started this project a couple of years ago. Her boats go out every day—day after day—under all weather circumstances. Most scientists spend only a couple of weeks 'in the field', but the Palauan dive masters are there each and every day. Together with the guests, they fill out forms—how many sharks, depth, water temperature, male or female? The 'receivers' on the reefs supply data on the moving patterns of the grey reef sharks. All



TOP TO BOTTOM: Preparing the tag and inserting the tag into the shark; Writing down all data (left)



shark tales



My, what big fins you have!

Text by Mark Meekan, scientist
Save Our Seas Foundation

Accurate estimates of body size are essential for determining the health of shark populations. In the past, this usually involved capturing and restraining animals in order to measure them, with the attendant risk of injury to both researchers and the sharks.

Fortunately, new technology has overcome this problem, and we are now able to measure, with great accuracy, the body proportions and size of free-swimming sharks. This is done using a stereo-camera system operated by a diver (diver-operated video or "DOV").

In Palau, a project funded by Save Our Seas Foundation and led by Dr Mark Meekan of the Australian Institute of Marine Science and Gabriel Vianna of the University of Western Australia has been using this approach to measure sharks at popular dive sites. Paired video cameras in housings film the sharks and a diode (light) in the front of the cameras allows the researchers to synchronize frames of the video.

Using principals originally developed for aerial photography, these researchers are then able to calculate the length of any body part and total size of the animal with a precision of a few millimeters. The technique is so accurate that the researchers can recognize individual animals by their body proportions. By repeatedly filming the same animals over a number of years, they will be able to measure growth rate of these sharks. ■

these data are of immense value for the research project.

The Micronesian Shark Foundation has made project presentations to the Honorable Johnson Toribiong—Palau's current president—the Counsel of Traditional Chiefs, board members from the Palau Visitor's Authority (PVA), Belau Tourism Association (BTA) board members and general membership, the Explorers Club and Oceanic Society Groups, also emphasizing the importance of sharks for a healthy

ecosystem and reefs and their value for the flourishing Palauan tourist industry. All this came with success; Palau became the first official Shark Sanctuary in the world!

Later this year, the Micronesian Shark Foundation and Save Our Seas will start an educational programme on the other islands of Micronesia. ■

www.saveourseas.com
www.msfpalau.org



CLOCKWISE FROM TOP LEFT: Back onto the stretcher; Back into the water—some sharks are held by the tail until the researchers are convinced it is fully recovered; Accurate measuring of sharks free-swimming in the water by using new technology—a DOV (Diver-Operated Video) stereo camera system; Shark-watching in Palau





Text and photos
by Lawson Wood

Certainly, natural light photography is much more prevalent for point-and-shoot cameras, as the internal flash on the camera rarely penetrates the water column far enough and powerful enough to be able to illuminate a large subject, such as a big fish, scuba diver, reef wall or shipwreck. White balance alteration will help this. However, you may wish to take a large wide angle photograph without flash, just to be able to avoid any problems of backscatter, should you have used flash. More often than not, what started out as a flash photography dive ends up being a natural light photography dive because your flash batteries have died on you just a few frames into the dive!

What do you do? Do you abort the dive, get out of the water, change batteries and jump back in? Unfortunately, this is not always possible, so you have to grin and bear it and look for a suitable subject that

Natural Light

Subject: Ras Muhammed, Sinai Peninsula, Egypt. 10mm lens, ISO 100, Natural Light, 1/80th second at F8





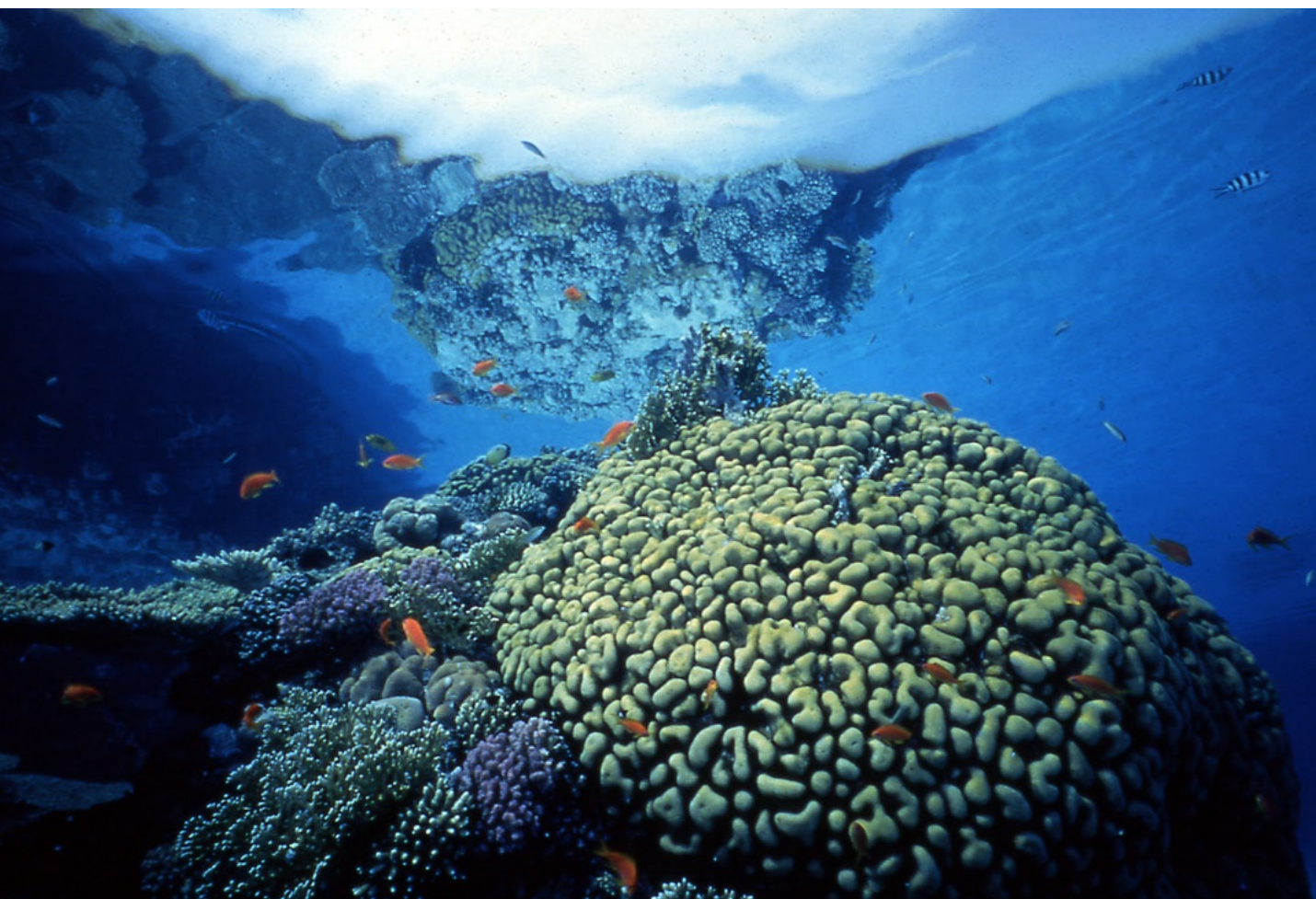
photo & video

Steamship *Kingston*, Shag Rock, Gulf of Suez, Red Sea. 10mm lens, ISO 100, Natural Light, 1/80th second at F5.6 plus Photoshop fix.

Subject: Steam ship *Kingston*, northern Red Sea. 10.5mm lens, ISO 200, Natural Light, 1/125th second at F.11

either suits the blue or green quality of the water. The subject matter may also lend itself to a quick fix in Photoshop, or you can go the whole way and take the photograph with a view to converting it to monochrome at a later date.

This is the Steamship *Kingston* (right) wrecked in the Red Sea in the late 1800s. As you can see the darker photograph lacks that 'oomph!' to bring it into the real world and is altogether rather dull. By doing two simple processes in Photoshop, the colour has been



fixed and the saturation is much more pleasing to the eye.

This natural light photograph (left) also taken in the northern Red Sea displays a certain optical characteristic that is only found underwater. *Snell's Window* is created when the surface of the water is absolutely flat calm, so much so in fact, that when viewed at an angle, the scene underwater is reflected on the under-surface of the sea. In fact, the reflection is actually of the other side of this large coral head in the foreground.

Whilst most underwater photographers would undoubtedly wish to photograph these colourful Red Sea subjects using flash for illumination, there is something to be said for the natural feeling that you get when using natural light. Also remember that many

Subject: Gordon Reef, Straits of Tiran, Red Sea. 15mm lens, ISO 100, Natural Light, 1/60th second at F8



Subject: Green Turtle (*Chelonia mydas*), Marsa Alam, Red Sea. 10mm lens, ISO 100, Natural Light, 1/60th second at F8





Subject: Humpback Whale (*Megaptera novaeangliae*) Ruruta, French Polynesia
15mm lens, ISO 100, Natural Light, 1/60th second at F8

Subject: *Bristol Beufighter*, Malta.
10mm lens, ISO 100, Natural Light, 1/100th second at F5.6

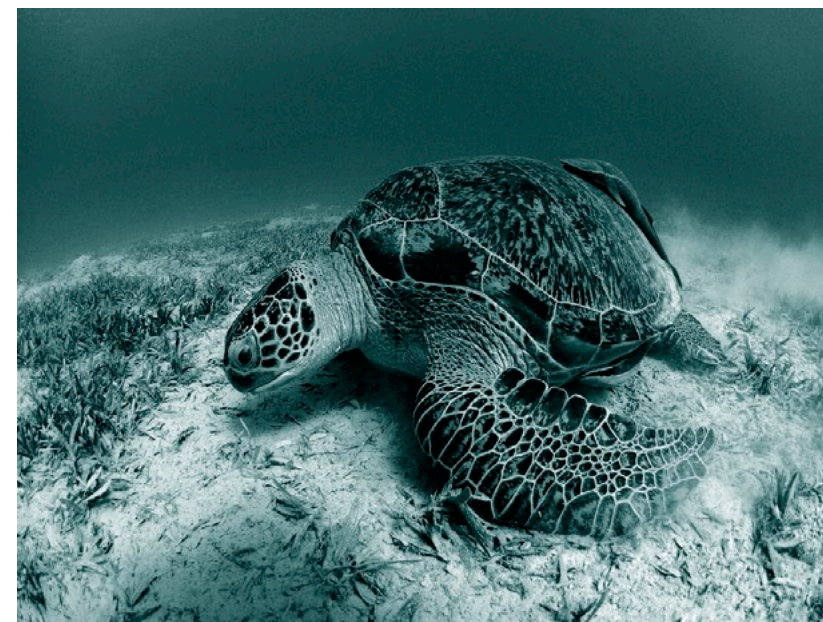


viewers of our underwater realm only see it from snorkeling and that virtually every wide angle view that you see in large blockbuster television series are also in natural light, so this type of scene would appear perfectly natural to anyone looking at it.

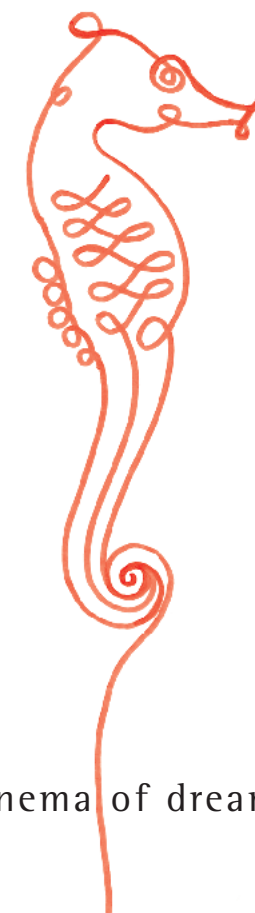
More often than not, it is the sea conditions or the sheer physical scale of the

creatures or subject matter that you are photographing that will determine whether you use flash or not. In the photograph below, the turtle was kicking up too much sand for the flash to be effective, in fact the use of flash spoiled the photograph. In the photograph above, this humpback whale was simply too massive and too far away for the flash to have any effect

BELOW: Green Turtle, Marsa Alam, Red Sea. 10mm lens, ISO 100, Natural Light, Natural light photography is also perfectly suited for some artistic licence. By not using flash, we are now able to interpret our photographs in another style, such as monochrome. By removing the colour channels and changing them into black and white, we now have the option to add a colour wash over the black and white image thus making it warmer in feel and perhaps not as harsh as monochrome.



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photo & video

Subject: Royal Navy Ensign on propeller shaft of *HMS Royal Oak*, Scapa Flow, Orkney Islands, Scotland. 15mm lens, ISO 400, Natural Light, 1/60th second at F5.6

Subject: Lionfish (*Pterois volitans*) Sh'ab Ali, Northern Red Sea. 10mm lens, ISO 100, Natural Light, 1/100th second at F:16

whatsoever. Natural light is the only option.

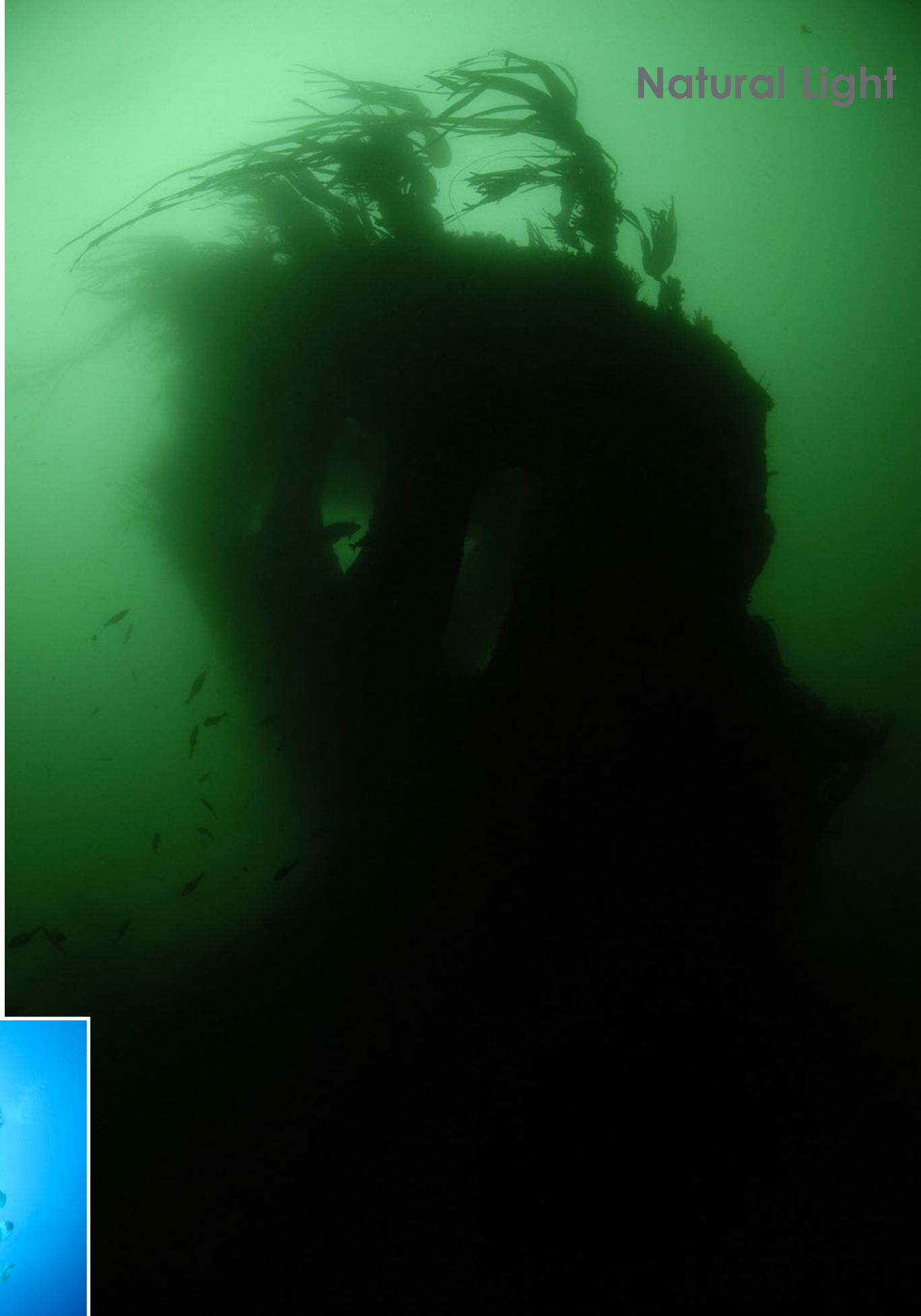
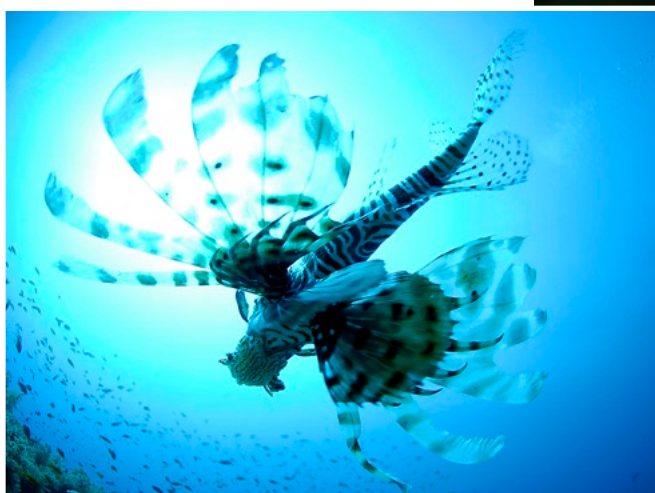
Shipwrecks always lend themselves to natural light photography. It is worth mentioning here that there are many different types

shipwrecks. Therefore more underwater photography is undertaken in natural light than in any other format giving most photographs viewed as being in shades of blue. We can make adjustments with



of underwater wreckage including aeroplanes, historic artifacts and in this case (above), the Royal Navy Ensign Flag, which is placed each year at the stern of *HMS Royal Oak* as a mark of respect for the 833 men who lost their lives in October 1939.

Whilst we all strive to use flash to get the colour we want, more often than not, the smaller compact cameras' own internal flash is just not strong enough to cope with any large vistas, creatures or



Natural Light

Subject: Blockship *Doyle*, Burra Sound, Scapa Flow, Orkney Islands, Scotland. 10mm lens, ISO 200, Natural Light, 1/80th second at F4

DivePhotoGuide.com

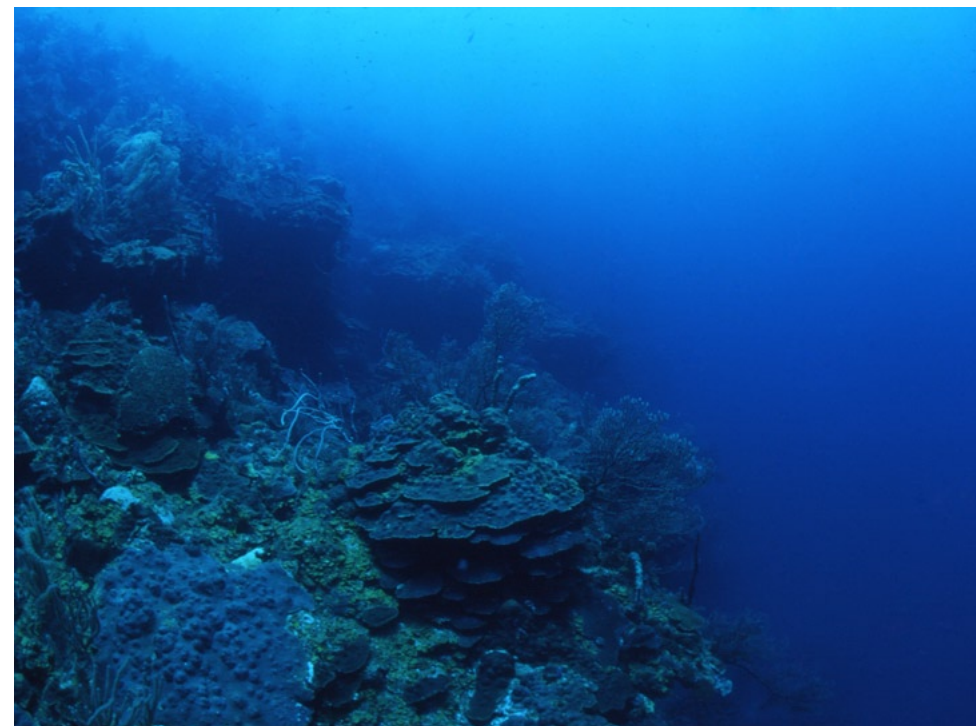
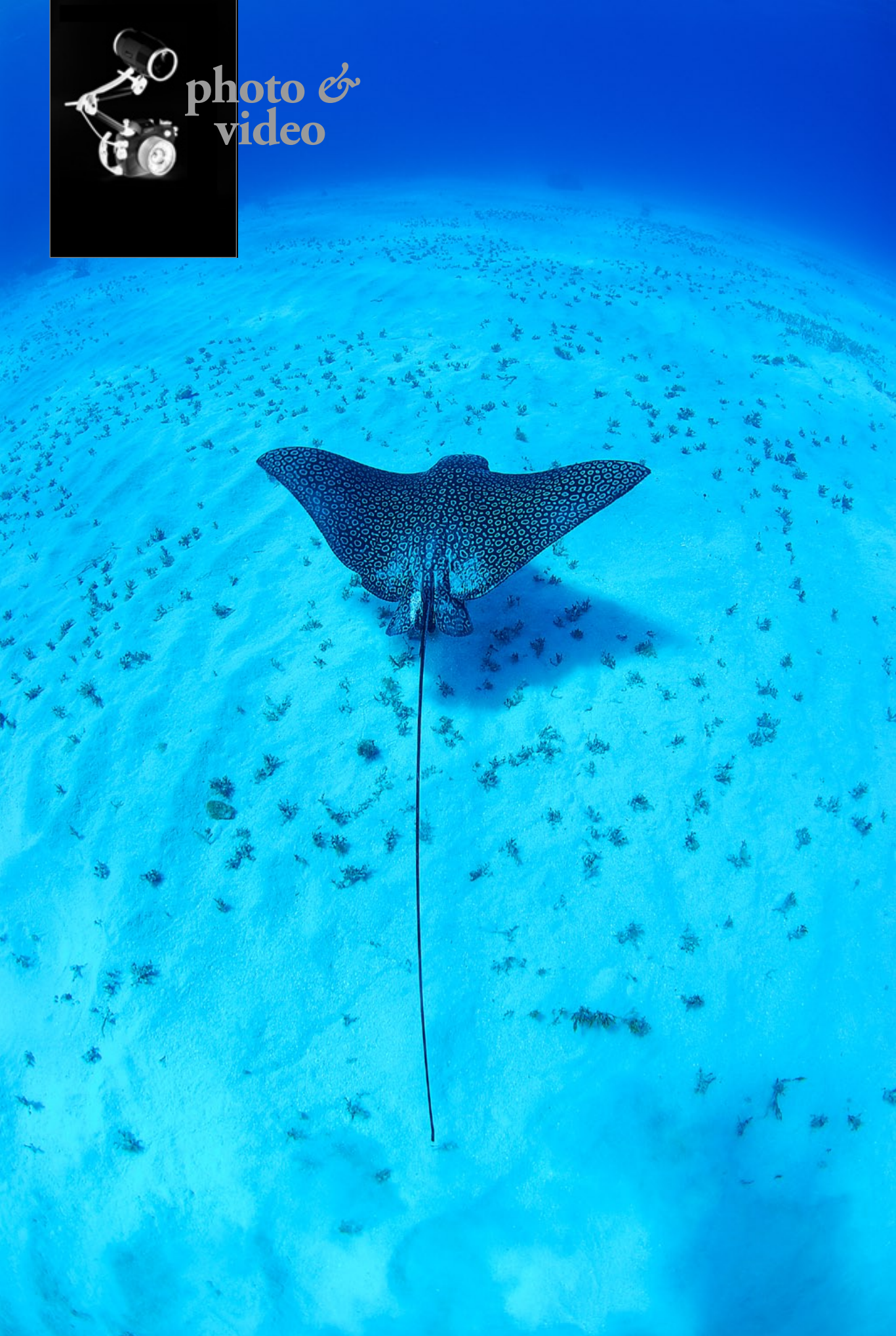


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DivePhotoGuide.com





Subject: Caribbean Reef, Hog Islands, Honduras
15mm lens, ISO 100, Natural Light, 1/60th second at F5.6

the white balance setting on the camera, use colour correcting filters or utilize quick fixes on photoshop or some other brand of image adjustment software. However, we still tend to use

natural light in all of its variations of blue and green colours to depict the scene we are trying to achieve and share that photograph with friends on the internet. ■



Subject: Whaleshark (*Rhynchodon typus*)
St. Anne Marine Park, Seychelles. 15mm lens, ISO 50, Natural Light, 1/60th second at F5.6

Subject: Eagle Ray (*Aetobatus narinari*)
Little Cayman Island, Cayman Islands. 10mm lens, ISO 100, Natural Light, 1/100th second at F5.6

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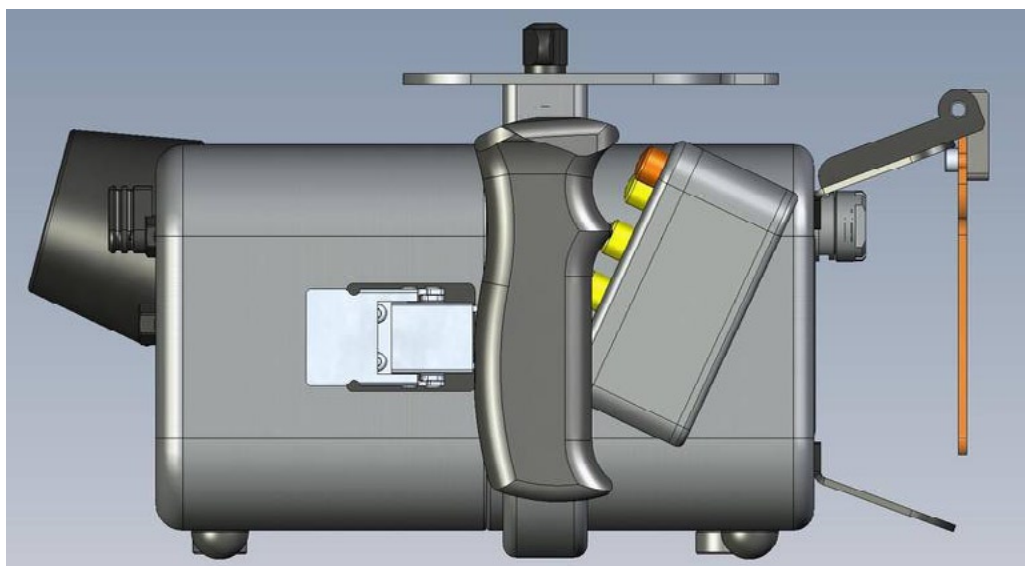
Inon Insect Eye

Inon announces "insect eye" conversion lens for compact cameras—the UFL-M150 ZM80 underwater Micro Fisheye Lens. The new lens provides 150 degrees ultra-wide angle fish-eye imaging, with a minimum focusing distance of 0cm and attaches via a "Mount Base" adaptor. To use the new lens the camera's zoom position must be set to approximately 80mm (35mm film equivalent).

Inon has also released a series of adaptors, including M27 to AD bayonet, M27 to M67 and M27 to LD mount. It is compatible with a wide variety of Olympus, Fujifilm, Sony, Canon and Panasonic cameras/housings. A full list of suitable housings is available as a pdf download on the link to the Inon site below. The new lens is available now. inonnews.blogspot.com

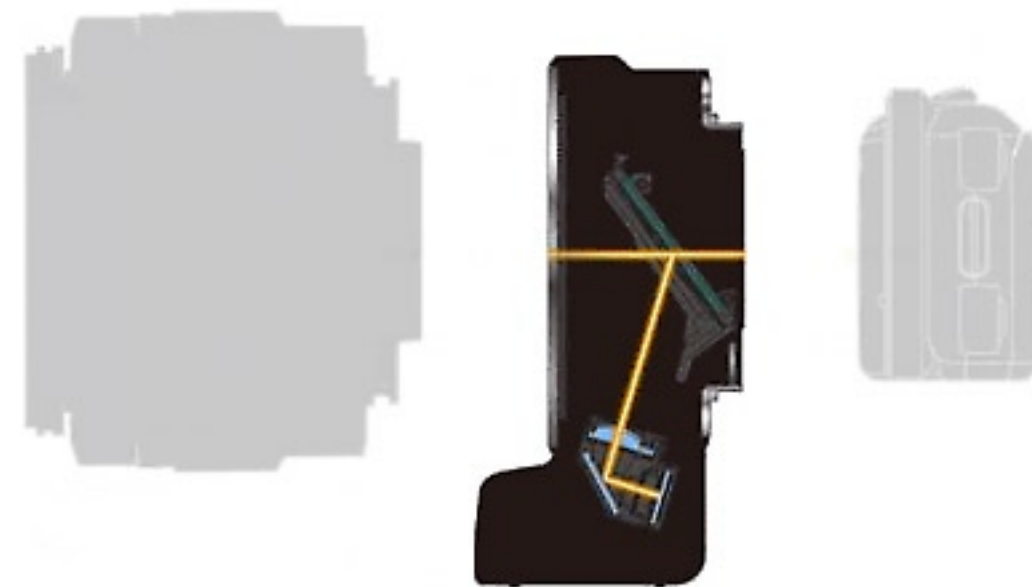
Sealux housings for Sony 3D cameras

Sealux has announced the release of two new housings for the Sony HDR-TD10 consumer and the HXR-NX3D1 professional camcorders. Both housings are manufactured of aluminum and allow the use of the cameras' LCD screens as monitors. The housing lenses are made of optical glass and "provides the full picture quality of the Sony 3D lenses". An attached lens hood avoids reflections on the lens, protecting against sunlight reflecting off of it. www.sealux.de



Gates REDMOTE controller housing

Gates Underwater Products has announced the release of a housing for the REDMOTE controller for use with the Deep Atom 3D and Deep Epic camera systems. The REDMOTE housing allows full access to all camera and remote control functions, and employs magnets to align the unit within the housing. Lastly, it has handles to allow the user to maintain control of the camera whilst using the remote at the same time. www.gateshousings.com



Sony NEX adapter for A-mount lenses

According to the Photo Rumors site, Sony will introduce a new lens adapter that will allow the use of A-mount lenses on Sony NEX. Called the LA-EA2, the adaptor will have a translucent mirror to support AF and it is expected that the adaptor will be officially launched on 24 August, together with two new EVIL cameras and two new SLRs. See: photorumors.com

Nauticam Panasonic GF2 housing

The NA-GF2 has access to all of the important controls on the camera including shutter release, zoom, movie record, and the control dial. The Fn (function) button is placed to be used by the right thumb. The GF2 command dial requires turning and clicking so Nauticam



has separated the dial function into two separate controls on the housing. The NA-GF2 housing also features a removable fibre optic bulkhead to allow for optical sync and TTL with external strobes, or the use of the internal flash. Ports are available for Lumix 4/3 lenses, including 14-24mm, 14mm, 8mm fisheye, Leica 45mm macro, Olympus 14-42mm and 9-18mm. www.nauticam.com



Nikon P7100

Nikon Releases CoolPix P7100 and AW100

Nikon has announced a series of new Coolpix cameras, including the Nikon COOLPIX P7100 and the AW100/AW100s. The P7100 will retail for \$500 and is the top of the line Coolpix range, will be available in September, has upgraded the shutter lag and response time from the P7000 it replaces. The camera is said to be able to acquire focus in 0.16 seconds and has a shooting time lag of 0.22 seconds which makes it a fast point and shoot. The camera has improved noise reduction and sports a lens that is equal to a 28-200mm lens, with f/stops ranging from f/2.8 to 5.6.

The AW series, is Nikon's first entry into shockproof/waterproof

cameras, is waterproof to 33feet/10 meters and features a 16 Megapixel camera, GPS and is shockproof up to a 1.5 Meter fall. The AW100/AW100s has a lens range of 28-140 and shoots video at 1920 x 1080, but does not capture RAW images. It is available in a range of colors, including orange which is reminiscent of the older Nikonos cameras. www.nikon.com



Nikon AW100

Sony's New NEX-7 EVIL Camera

Sony has introduced the NEX-7 all-in-one compact interchangeable lens camera with 24.3 megapixel resolution. While still lacking the full complement of lenses required by discerning underwater photographers the new NEX-7 is definitely a step in the right direction. The camera's small size but excellent functionality makes it a strong contender for underwater photography once the outstanding lenses are available and the housing manufacturers release their products for the NEX-7



SeaLife SL980 Underwater Photo/Video Light

SeaLife has introduced the revolutionary SL980 Underwater Photo/Video Light. It is a powerful 500-lumen LED light source composed of a three-position array of 6,500K-color-balanced 3-watt Cree XP-G R5 LEDs. The light is good for close-up underwater photography and videography enabling shooters to capture more detail and depth in close-up shots, which strobe-only pictures often lack due to flash intensity. Even illumination comes from a 70-degree wide-angle beam. It also doubles as a continuous dive light. Depth tested to 300ft. Fits all SeaLife cameras.

www.sealife-cameras.com



Sony Releases A77 SLT Camera

Sony announced the release of the A77 SLT (single lens translucent) camera, which is looking a serious competitor to the established brand leaders. Specifications include 12 fps burst shooting, 19 point AF, 24.3 megapixel Exmor sensor, HD movie capability at 50p/25p and an ISO sensitivity range from 50 to 16000. In video mode, the camera allows for manual focusing and P/A/S/M exposure modes. When the specifications of this camera were leaked to the photographic press, it was noted that this is a camera that housing manufacturers should be including in their plans.





Nudibranch *Safari*



*Text and photos
by Christian Skauge*

*—Cold water nudibranch world
record at Gulen Dive Resort?*

The 2012 Nudibranch Safari at Gulen Dive Resort was a phenomenal success. A staggering 49 species of nudibranchs and seven other ophistobranchs were identified during the weekend—on one divespot.

Expectations ran high as 16 participants from Norway, Sweden, Denmark and the Faroe Islands gathered at Gulen Dive Resort north of Bergen in Norway to look for nudibranchs the last weekend in March.

Beforehand, the organizers doubted whether it would be possible to find more species than last year, when participants identified

what was at the time thought to be an almost unbeatable number of species: 36 nudibranchs and 4 other ophistobranchs. Their doubts were quickly put to shame as the Nudibranch Safari progressed – but even the most optimistic were surprised at the final outcome.

A scientific sensation

After diving the magnificent house reef at Gulen Dive Resort for four

days, a staggering 49 species of nudibranchs and 7 other ophistobranchs had been documented and collected – including two species never before observed in Norwegian waters.

Never before have so many species been documented in just one spot in Norway. The finding of two species never before seen in Norwegian waters and one that has not been documented for 140

years is no less than a scientific sensation.

Underwater photographers Thorbjørn Rusnes and Erling Svensen each found a new species – a *Goniodoris castanea* and an *Onchidoris oblonga*.

Apart from these spectacular observations, the rare *Tritonia lineata* was documented for the first time since 1878 in





Nudibranchs



Norway, and the rarely observed species *Onchidoris depressa* and *Colpodaspis pusilla* also made appearances. Several of the participating divers found other rare species.

Nudibranch Project

As was the case on last year's Nudibranch Safari, scientists Jussi Evertsen and Torkild Bakken from the Norwegian University of Science and Technology (NTNU) were responsible for the workshop. They were again duly impressed by the many species found on the Gulen Dive Resort house reef, and

brought back a number of species for DNA barcoding and classification.

The two scientists have since 1997 been running a project called "Nudibranchs of the Norwegian Coast" and are among the most experienced in the world in their field.

On their project website www.nudibranchia.no they have published a list of all the species so far documented after the Nudibranch Safari. The work is still in progress, and even more new species might turn up – several strange species were found that will have to be

investigated further.

The participants had access to stereoscopes and nudibranch literature all weekend to help identify and study the collected specimens in close-up detail. A steady stream of subjects was put under the scopes, and it was not long between excited outcries from the scientists – a rare species had turned up.

High level

The Nudibranch Safari is basically for everyone, regardless of experience or education. This year's gathering nevertheless held a very



Nudibranchs

high standard – no less than four marine biologists and several of the best Norwegian underwater photographers turned up. Among the latter was Erling Svensen, known for photographing the excellent book *Marine Fish & Invertebrates of Northern Europe*, a must-have for all divers interested in marine biology.

The media were also interested in the Nudibranch Safari, and several local newspapers wrote about it both before and after. The Norwegian state broadcaster

NRK also published a story; so did even the Rumanian website www.mydive.ro!

A perfect habitat

The house reef at Gulen Dive Resort has proven itself to be a perfect habitat for nudibranchs, and the number of species observed so far is almost impossibly high: Norwegian waters harbour close to a hundred different nudibranchs, of which around 30 are deep-water species. The fact that the participants on the Nudibranch Safari

managed to find more than half of all known species and about ¾ of the ones found on diveable depths is nothing short of incredible – especially when considering that this was all done on one single divespot!

A new Nudibranch Safari has already been planned for 2012, and because of the great interest it will be extended to four days. Mark the dates 20.-25. of March in your calendar if you're interested! It will be very exciting to see if there are still more

species out there waiting to be discovered.

READ MORE
www.gulendykkesenter.no
www.undervannsfoto.no
www.vm.ntnu.no