



GLOBAL EDITION  
October 2016  
Number 75

Great White Sharks  
**Guadalupe  
Island**

Newfoundland  
**Mine Quest**

Unique Dive  
**Yellowstone**

Lesser Antilles  
**Dominica**

UW Photo  
**Shooting  
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Profile  
**Bill Main**

INDONESIA'S

# **Komodo Island**

COVER PHOTO BY BRANDI MUELLER

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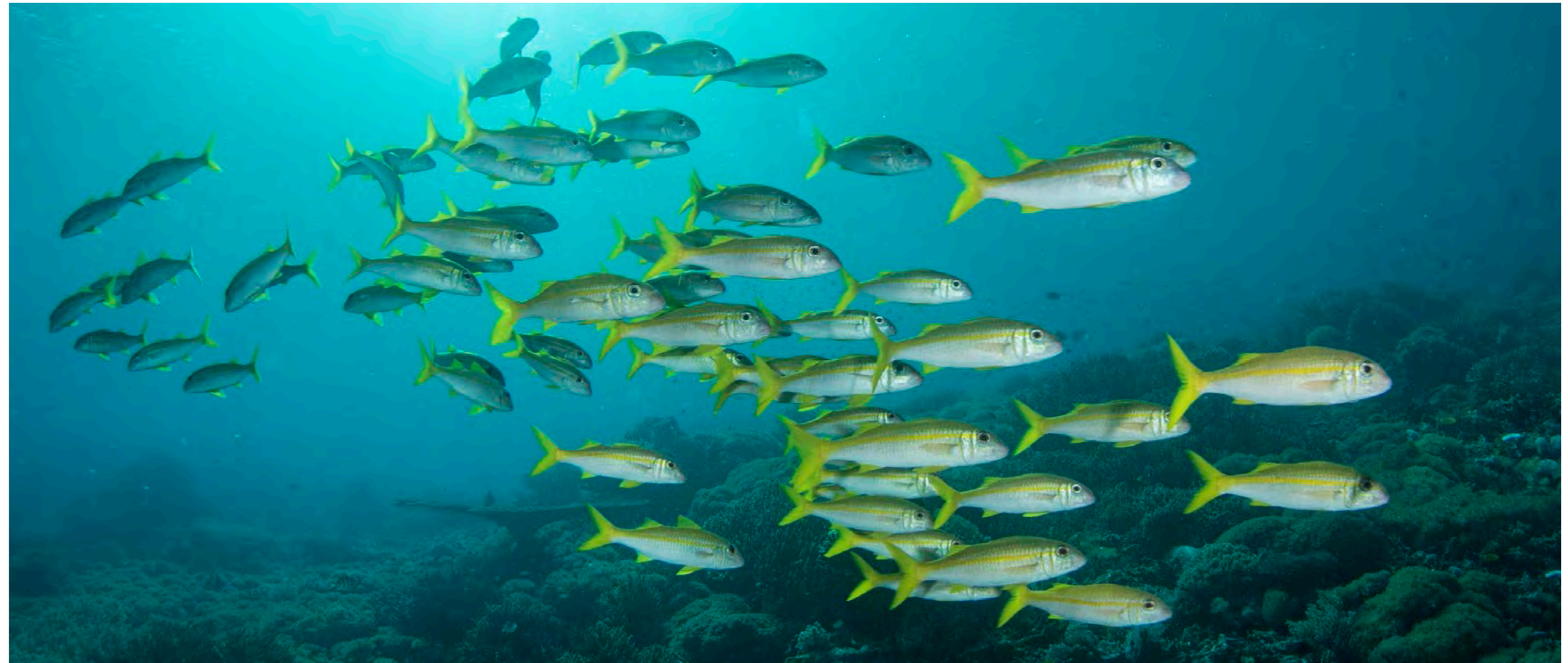
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COVER PHOTO: Sea pen crab on sea pen,  
Komodo Island, Indonesia. Photo by Brandi Mueller.

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School of goatfish, Komodo Island, Indonesia. Photo by Brandi Mueller



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## On Climate Change — Deniers & Members of Flat-Earth Society

I was stunned, last year, when an acquaintance of mine, who was otherwise well-educated, stated to my face that climate change was a hoax and conspiracy concocted by the Chinese to put American businesses at a competitive disadvantage—a statement so ridiculous on all levels and devoid of any inner logic that I felt saddened.

As it is nothing but an exercise in futility trying to argue with conspiracy theorists and their ilk in any meaningful and productive way, I resisted the urge and changed the subject.

Climate change and its causes (us humans) have been more thoroughly investigated, measured and documented than few other phenomena. The UN Intergovernmental Panel on Climate Change coordinated tens of thou-

sands of scientists from multiple disciplines and from many countries, and the consensus they reached was strong and unequivocal. It is now also plain to see; the weather is going crazy, and ecosystems are changing before our very eyes.

What troubles me in no small measure is seeing the same conspiracy nonsense propagated by some candidates running for public office—the upcoming elections in the United States being the most obvious but not the only example.

We have seen such mechanisms in play before, like when the tobacco industry spent fortunes to refute that smoking caused cancer, hiring lobbyists and their own “experts” to discredit growing scientific evidence, not as a part of sound academic discourse

but with the motive of trying to offset the inevitable for as long as possible so greedy businessmen could rake in millions more in profits.

Although the Kyoto Protocol on climate change was adopted in 1997 and signed by President Bill Clinton in 1998, as of 2016, the United States remains the only signatory that has not ratified the Protocol. It was never ratified for reasons you can read about on Wikipedia and elsewhere (hint: the oil and gas lobby).

Please make a wiser decision this time, voters. The World Meteorological Organisation (WMO) warns the present rate of climate change is both “alarming” and “unprecedented”.

— Peter Symes  
Editor-in-Chief



News edited  
by Peter Symes

# NEWS

*from the deep*

## UK set to protect four million square kilometers of ocean

Four vast marine reserves are to be created around remote British islands in the Atlantic and Pacific oceans, the Foreign and Commonwealth Office has announced.



Hosted by US Secretary of State John Kerry, the two-day "Our Ocean" conference brought together governments, scientists, business leaders and NGOs.

The bans come into force immediately around Pitcairn in the south Pacific and St Helena in the south Atlantic. Reserves will be created around Ascension Island in the south Atlantic by 2019 and Tristan da Cunha, also in the south Atlantic, by 2020.

Commercial fishing will be banned permanently in a million square kilometers of ocean teeming with sharks, turtles and whales. Destructive methods of fishing will be banned in another million square kilometres. In total, the government is creating marine protected areas around four islands in the Pacific and Atlantic, including the designation this week of one of the world's biggest around the Pitcairn Islands.

The announcement was made by Foreign Office Minister Sir Alan Duncan in the framework of the two-day "Our Ocean" conference held in Washington DC, gathering global business leaders, government officials, NGOs representatives and experts.



Foreign Office Minister Sir Alan Duncan

### Pledge

The United Kingdom will pledge GB£20 million over the next four years to support the implementation, management, surveillance, and crucially, the enforcement of these new Marine Protected Areas (MPAs).

The United Kingdom and the Overseas Territories are custodians to the fifth-largest marine estate in the world. In 2015, the UK Government committed to creating a "Blue Belt" around the 14 UK Overseas Territories.

"Protecting four million square kilometers of ocean is a fantastic achievement, converting our historic legacy into modern environmental success. This demonstrates our commitment to delivering the Blue Belt pledge," said Sir Alan Duncan. ■

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Conformity needed to make a group decision was found to be stronger than braver fish leading. That said, despite social coordination, bolder individuals were still more likely to feed.

# "Yes, we are all individuals."

Once in a school, fish lose their individual personalities, new research suggests.

Connoisseurs of "Monty Python" would know instantly what the headline refers to. For the uninitiated, it stems from a skit in the 1979 cult movie, "Life of Brian." The main character, Brian, tells a crowd of followers to go away and not follow him because "You are all individuals!" to which the crowd robotically replies as with one voice, "Yes, we are all individuals." The skit can be seen (or re-seen) on this link to [YouTube](#).

Some think a similar mechanism seems to affect fish. Once they aggregate in a school, individuality gets suppressed. At least, that is what scientists from the University of Bristol in the United Kingdom have observed.

### Suppressed individuality

Working with three-spined sticklebacks, the researchers observed that just like in humans, braver individuals led the

groups, and that the fish stuck together when making a risky decision.

### Consensus decision-making

They also concluded that the conformity needed to make a group decision is stronger than braver fish leading, meaning overall, that the individual

*The research, suggests that in social animals, when things get dangerous and animals form cohesive groups, risk-taking tendency when alone may not be a good indicator of the risk an individual actually faces.*

personalities of fish were lost when in a group.

In a University of Bristol press release Dr Christos Ioannou stated, "This is the first time that the suppression of personality in groups has been linked to its underlying cause, which is conformity in group decision making."

### Plastic behavior

Ioannou added, "The behavior of the fish seems to be 'plastic' to the social situation—they show consistent indi-

vidual differences in behavior when tested alone—reflecting personality, but they are also happy to suppress this to be able to stick together with their shoal mates if there are others around."

### Reversal

The researchers also found that testing in a group did not have a lasting effect when individuals were retested alone; it was as if the group tests never happened. ■

SOURCES: UNIVERSITY OF BRISTOL, SCIENCE



Three-spined stickleback

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THIS PAGE: In Malaysia, Kids Scuba teams up with Diveheart to offer scuba courses specially designed for persons with disabilities



# Training Disabled Divers in Malaysia

**Kids Scuba is a PADI 5 Star Dive Center in Subang Jaya, Kuala Lumpur, Malaysia, which strongly supports the Diveheart Program. Hj. Syed Abd Rahman, the founder and director of Kids Scuba and a PADI IDC Staff Instructor is currently the Ambassador for Diveheart in Malaysia. He oversees the special program designed for person with disabilities (PWD) and special people that allows them to experience zero gravity underwater in a weightless environment. He shares his insights and perspectives here.**

Text and photos courtesy of Hj. Syed Abd Rahman

The objective of the program is to build confidence, independence and self-esteem in the lives of children, adults and veterans with disabilities through the sport of scuba diving, scuba therapy and related activities.

The purpose of the program is to provide and support educational scuba diving programs with PADI courses—such as the PADI Seal Team, PADI Junior Open Water and the Open Water Diver course—that are open to any child, adult or veteran with a disability, with the hope of providing both physical and psychological therapeutic value to that person.

The program's focus is both on train-

ing and travelling, as we have PWD divers and participants joining our island trips to Tioman Island in Pahang, Malaysia, as well the island of Bali in Indonesia, to complete their PADI Open Water certifications.

## Response

The response has been good in Malaysia, especially in Kuala Lumpur. We now work closely with the professors and doctors of the University of Malaysia Medical Center Department of Rehabilitation Medicine in the training of the PWD students from the University of Malaysia and in the training of the second batch of four PWD youths for the PADI Open Water Diver course.

Kids Scuba and Diveheart in Malaysia work with individuals who have a variety of disabilities, including physical and devel-

opmental disabilities, vision and hearing impairments, amputations, post traumatic stress disorder and other ailments. Kids Scuba and Diveheart in Malaysia seek to help its participants "imagine the possibilities" in their lives.

## Benefits

The program helps to instill the "I can do it" and "We can do it" spirit in participants, inspiring them to take on challenges that they may not have considered before. Using zero gravity and the adventure paradigm of the program, we help participants believe that if they can scuba dive, they can do anything. We have discovered that the forgiving, weightless environment and wonder of the water column provides the perfect gravity-free environment for those

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who might otherwise struggle on land. In the underwater environment, we are all equal.

The sport of scuba diving can help persons with impaired hearing to start a career in commercial diving. Persons with leg amputations may also be given a chance to do commercial diving. I personally refer to quotes from the movie, "Men of Honor," starring Robert De Niro and Cuba Gooding, Jr., which is based on the real-life experience of a US Navy diver.

### Marine parks

In Malaysia, dive locations such as Tioman Island in Pahang, Redang Island in Terengganu, Kota

Kinabalu Marine Park and Mabul Island in Sabah, Borneo, have seen scuba diving or snorkeling programs involving PWD divers getting certified in the PADI Open Water and Advanced Open Water dive courses.

The program has grown successfully from a small group, a few years back, to large groups of divers, volunteers and assistants involved in the scuba diving and PADI certification programs at the marine park islands of Malaysia.

### Advice to other dive centers

As a PADI dive professional and a scuba educator for the past 15 years, I strongly believe that we should always reach out to other communities and assist others, especially the "special people", and share what we have and our professional knowledge as a role models in the sport of scuba diving.

Organizations, such as Diveheart, have complete training programs to assist certified divers and dive professionals learn how to conduct courses designed to coach, train and guide persons with disabilities in the sport of scuba diving involving water therapy.

The accomplishments, efforts and success of individuals with disabilities in the water after completing their scuba diving excursions and PADI dive courses are just amazing beyond words. ■

For more information, please visit: [KidsScuba.com](http://KidsScuba.com) and [Diveheart.org](http://Diveheart.org).



The number of participants, volunteers and assistants in the joint Diveheart and Kids Scuba disabled diver programs and courses in Malaysia continues to grow



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NAUI Instructor (left) evaluates his FIT candidate's ability to demonstrate sharing air. Rescue skills (below) are just one of the many areas assessed in the NAUI FIT Program.



NAUI FIT candidate (below) discusses the use of the NAUI surface air consumption (SAC) rate calculator with his instructor trainer.

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Text by NAUI Worldwide Training Department. Photos courtesy of NAUI Worldwide

**With its Familiarization – Instruction – Testing (FIT) program, NAUI once again takes the lead in setting the industry standard for quality instruction and leadership training.**

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**4. Develop communication skills.** Effective communication is one key to successful leadership.

**5. Enroll!** If you are at least 18 years old and confident that you have the skills, knowledge and ability to become a NAUI Leader, or just want to see where you stand compared to NAUI Leaders, then you are ready to enroll in a NAUI FIT Program.

Learn more about getting FIT and becoming a NAUI Leader at [naui.org/certifications/leadership/fit/](http://naui.org/certifications/leadership/fit/).





Edited by  
Peter Symes



*If the flight is full and you are last in the queue—chances are, your bag is going to be put in the hold. The only real way to ensure your hand luggage stays in the cabin is to turn up bright and early for your flight.*

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Single aisle Boeing 737 used by Scandinavian Airlines serving Boston on the US East Coast from Scandinavia

## Narrowbodies to go longhaul

**Smaller jets will open up direct routes that would not otherwise be viable. At the same time, people can look forward to competitive fares as carriers seek out smaller airports where access charges are lower.**

The latest versions of small passenger jets, once designed to serve short- and medium-haul destinations, are now seeing them operate intercontinental routes, which were previously the preserve of some of the world's biggest planes. One single-aisle airliner—Boeing's 757, with around 200 seats and a range in excess of 6,400km—has been used on trans-Atlantic routes for years, but production ceased in 2004, leaving those 757s still flying in the twilight of their lives and with fuel consumption far in excess of

modern jets.

While ranges have increased Boeing's 737 and Airbus' A320 family, the 5,400km reach of the 737-800 and -900 is not quite sufficient for fully laden operations on trans-Atlantic routes where jets must carry enough reserve fuel to fly about 500 miles in an emergency. Consequently, a handful of carriers operate services at reduced capacity. Meanwhile, a long-range version of Airbus's A321neo—known as the LR—is able to fly more than 6,400km, using extra fuel tanks. ■

## Confounded by carry-on complexities?

**With more and more airlines charging for bags in the luggage hold, many of them have also gotten a tad fussy over the size and weight of carry-ons, which some of us tend to stuff with regulators, instruments and photo equipment—precious but heavy gear. What we used to get away with in the past may not fly in the future (pun intended).**

### What goes?

Frustratingly, despite attempts to standardise cabin bag requirements, maximum dimensions vary, depending on airline or aircraft. Some airlines may allow an additional personal item. Personal items include handbags, laptop bags, briefcases, small backpacks and shoulder bags, but it is not very clear how big these may be. In many cases, personal items need to be able to fit under the seat in front of you.

### No common standard

A quick glance at various listed allowable dimensions shows measurements ranging between 53 and 60cm in height, 34 to 45cm in width and 19cm to 27cm in depth. Thus the biggest possible volume is more than twice that of the smallest—and some count wheels and handles. Meanwhile, weight is limited to a measly 7kg (15lb) upwards to 23kgs (51lb).

### The "personal bag"

The latter, rather generous weight allowance, is listed by British Airways, which allows more hand luggage on board its flights than most of its commercial competitors. BA has, however, reduced the size of hand luggage, after claiming that passenger bags were getting so big, it was causing regular flight delays. The airline, which allows each person to have two bags in the cabin, is almost halving the size of the "personal" bag, which may not be bigger than 40 x 30 x 15cm.

### Weigh your bag empty

I was in for a surprise when I recently weighed my trusted, wheeled carry-on (like the one shown on the image to the right). I always thought of it as being lightweight. Nonetheless, even empty, it tipped the scale at 6kg, which just about leaves room for a t-shirt and a toothbrush, with some of the stingier airlines.

### Time to get a new bag?

It may be time to bite the bullet and simply switch to a lighter and smaller bag. The question is whether it should be a one- or two-wheeled travel bag, hard or soft sided? Hard cases provide better protection for your belongings, but they are heavier, thicker (so less internal space) and will not squeeze into spaces, making them harder (or unable) to fit into cramped overhead lockers or under the seat. Soft-sided bags, on the other hand, offer less protection of, say, camera equipment, but are lighter, offer more space and can be squeezed into small spaces and com-

pressed, so they are not unnecessarily bulky when only partially full.

### Redistribute

I use one of each, supplementing my roller bag with a light back pack. As personal items are rarely weighed, I put all my heavy photo equipment in a light backpack while checking in. Once I am past security, I put lenses and cameras back in the hard-sided carry-on with wheels, where it is better protected. ■



# *Indonesia's* **Komodo Island**

Text and photos by Brandi Mueller





View of Gili Lawa Darat off Komodo Island (above); *Stiliger ornatus* nudibranch (right)

**It was one of those diving vacations where the weather was perfect, the seas were calm, the sun was shining, and the waters were warmer than expected, with good visibility and plenty of life. The boat was beautiful, the crew was fantastic, the food was amazing, the coffee hot and the beer cold. And the diving location was like no other. Let me take you to Komodo.**

*(I will warn you in advance: This story is about one of "those" trips. It might make you green with envy, but it will definitely make you wish you*

*were there, and will probably have you planning your next dive trip to take place in this magical spot.)*

For me, diving is like pizza, it's always good. But some trips stand out. Sometimes service goes above and beyond what is expected, and sometimes the ocean smiles upon you and shares her most amazing secrets with you.

Most dive travelers are pretty capable, we don't need anyone to greet us at the airport and collect our bags from the baggage claim so that we don't



Komodo dragon lizard





CLOCKWISE FROM LEFT: Indo Siren liveaboard in the bay of Komodo Island, Indonesia; Cheesecake dessert on Indo Siren; Dive gear neatly stowed for each guest aboard Indo Siren; One of the comfortable cabins of the liveaboard

diving. But, I will admit, all of the above sure is nice.

**The liveaboard**

The fantastic service of Siren Fleet started as soon as our little party of divers arrived in Bima on the island

of Sumbawa, just a short flight from Bali. We were greeted at the baggage claim and taken a short distance to the harbor where a dingy met us and took us to the beautiful liveaboard, *Indo Siren*. The *Indo Siren* was built specifically for diving and is a traditional ironwood Indonesian Pinisi sailing ship. The ship takes up to 16 passengers, but we lucked out with only five guests on our trip, with a crew of 15! Onboard, we spent some time getting to know our home for the next ten nights, including unpacking in our spacious cabins with ensuite bathrooms, and setting up dive gear on the dive deck, which had plenty of space with individual drawers to store things like flashlights and reef hooks and places to hang wetsuits.

The indoor lounge had comfy sofas and a large flat screen

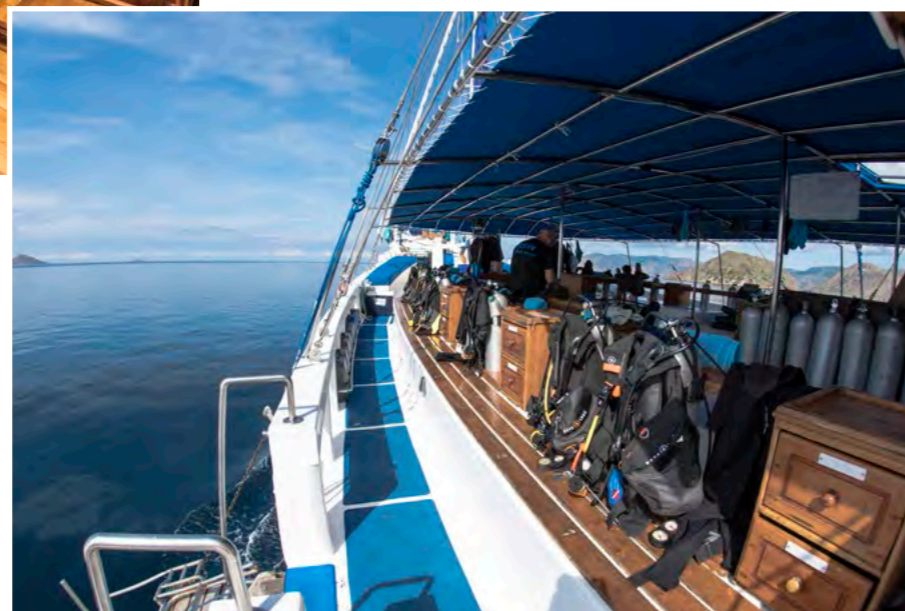


TV, and the dining area at the stern of the ship was open air, but with the possibility to drop plastic curtains to keep the rain out. My favorite area was the sundeck with lounge chairs, which was a great place to hang out while the boat was transiting.

For the photographers, there were several large tables with plenty of charging ports for camera set up, lens changes and charging. Each diver also got a drawer under the camera table to store chargers and other dry items.

After unpacking and exploring, we got settled in for the boat and dive briefing. After a fantastic dinner that promised of more to

even have to lift them. We don't need the crew to carry our cameras for us into the dingy or allow us to take scuba kits off in the water and pass them up to preserve our backs. We don't need someone making us eggs to order for breakfast, or four different options of entrées at lunch and dinner, as I'd happily eat peanut butter and jelly while diving, if that's all there was. We don't need laundry service or to get massages on the sundeck after



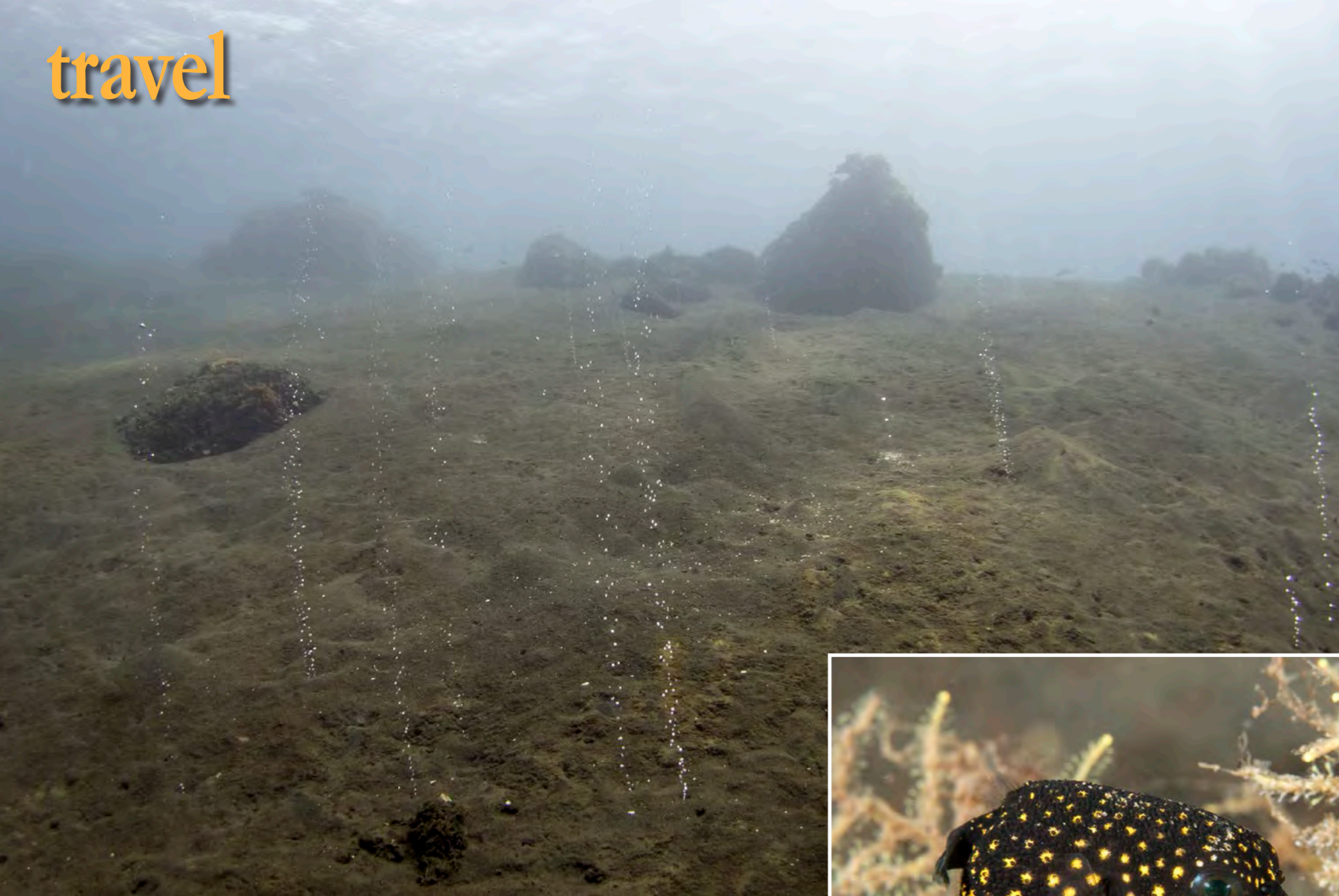
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Bubbles rising from the sea floor due to volcanic activity at the dive site known as Hot Rocks (left); Mimic octopus (above and below); Juvenile guineafowl pufferfish (center)



*Eubranchus sp.* Nudibranch

come, we had a few local Bintang beers and got to know our shipmates before heading off to bed for an early night.

**Day 1: Sangeong Island**

**Bonito Reef.** The captain and crew were up early, moving the boat northeast to the island of Sangeang, and our first dive was at Bonito Reef, a muck dive that was also our check-out dive. It was a pretty amazing check out dive too.

One of the muck critters that have eluded me for many years of diving is the mimic octopus. On this dive, I was following our dive guide, Inyo, when he stopped and put his hand up for me to stop too. I watched him get closer and slowly put his pointer stick out in front of two tiny eyes



sticking out of the sand. A few seconds later a tentacle emerged and touched the stick, checking out what it was, and then there was another tentacle. In a flash the whole mimic was out on the sand flashing white and brown stripes and gliding along the bottom. (I saw this all through my lens as I was snapping away). Back on the boat, I was laughing to myself how I

just checked off a major critter on my wish list... on the first dive!

Moving around Sangeang the water was flat as a lake and while we were sipping hot tea and coffee and talking about the first dive, dolphins broke the glass-like water right

next to the boat. Behind the dolphins, we looked up at the volcanic peak on Sangeang, which had small wisps of smoke emerging. The crew reassured us the volcano is "alive", not active, and it was just a little smoke.

**Hot Rocks.** More evidence of the volcano was seen on the second dive at a site called Hot Rocks. Streams of bubbles could actually be seen coming up from the sand and several rocks underwater were hot to the touch. As if just seeing the bubbles rise wasn't cool enough, there were also large sea fans with longnose hawkfish, brightly





Corallimorph decorator crab (left); Blue ribbon eel (above); Common octopus (right); Scorpionfish (below)

**Stargazer Beach.** Our last dive of the day was the night dive, and as we pulled away from the Indo Siren in the dingy, I was taken aback by how dark it was away from the lights of the boat. The moon had not



colored anthias and two leaf scorpionfish right next to each other.

**Deep Purple.** The dives seemed to get better and better and our third was at Deep Purple, named for the huge purple sea fans which were numerous. And guess what lives in sea fans? Bargibanti pygmy seahorses. I am always amazed when dive guides point these tiny beauties out because they blend in so well, but our dive guides found tons of them! We also saw blue ribbon eels, in both the black and the blue stages.



yet risen and there were more stars than I thought imaginable. The black outline of the island's hills sharply contrasted the star-spotted sky and the Milky Way was bright directly above us. Our night dive site was called Stargazer Beach, named after the critter, not the

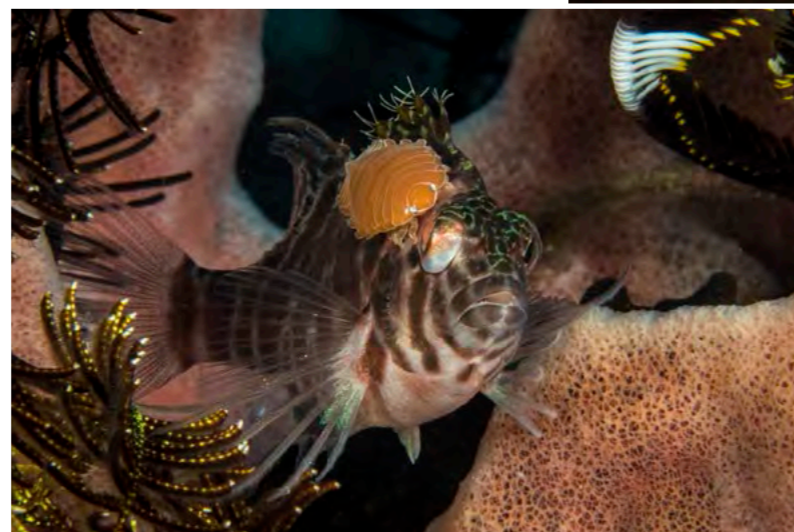
actual stars. But at that moment, I was a stargazer and couldn't take my eyes off the sky until it was time to back-roll into the inky black water.

I have a theory that once you name a dive site after something, you never see it again, and although they guaranteed me there were plenty of stargazers there, I didn't see any. It didn't matter though, because there was plenty of other things to see, including wild-looking corallimorph decorator crabs, flatheads, nudibranchs and tons of huge

Juvenile yellow spotted boxfish



Schools of fish at Shot Gun (above); View of sunset over bay from top of Gili Lawa Laut (right); Hawkfish with isopod (below); Lionfish and anthias on reef (left)



lionfish, which seemed to sneak up on you and hide right under your stomach. Not a bad ending to a pretty awesome day.

**Day 2: Komodo Island**

**Coral Garden.** Continuing east we woke up to the island of Komodo and did our first dive at a site called Coral Garden. Fire dart fish were every-

where, and streams of dark-banded fusiliers swam past us. In the sand, long garden eels emerged feeding on plankton, until we got close and then they lowered themselves back into the sand.

**Crystal Rock.** During breakfast, we moved to Gili Lawa Laut, and the second dive was at Crystal Rock where there were lots of hawkfish with large isopods on their heads or tails. I always feel bad for these guys, as having a parasite on you must not be very nice.

**Shot Gun.** Our third dive was a bit

of an adrenalin rush called Shot Gun. The dive goes through the pass between Gili Lawa Laut and Gili Lawa Darat, which eventually narrows into a steep canyon filled with fish. The current builds as the canyon narrows and shoots you at high speed through the canyon. At the end of the passage, the current calmed down, and yellow sunbeams were just breaking through the water, giving the reef a peaceful glow after the adventure.

**Sunset hike.** Instead of a night dive, we went for a sunset hike up Gili Lawa Laut and I will admit during the hike, I was wondering what we were doing. This was vacation, no exercise necessary, right? But the view from the top was worth it. Looking down on the green hill islands, with contrasting sap-



Emperor angelfish and fan coral

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Sweetlips and anthias under a table coral

phire water of two bays, was fantastic, as the sun was setting and the sky began to turn orange.

### Day 3: Currents and mantas

**Castle Rock.** First up was Castle Rock, one of the icon dives of the area, which is a pinnacle subject to strong currents. We back-rolled into the current, reef hooks ready, and it felt like we had just plunged into fish soup—except it was fast soup. The current was raging, and the fish were swimming just as fast. Huge schools of unicorn fish, jacks and banner fish rained down on us as larger groupers, tunas and sharks passed through them, as if the current wasn't even there. Off in the

distance, I saw a large shadow, which turned out to be a massive school of batfish that got closer and eventually passed right around me.

I kept thinking to myself after every dive, "How are they going to top that?" And it honestly did just keep getting better and better. After our post-dive hot ginger tea and another fantastic breakfast, we were off to Batu Bulong, which I would rename Anthia Heaven if I could. This area is also known as Current City, and when there is current, the marine life is amazing!

**Batu Bulong.** This site is another pinnacle rising from the seafloor, and the entire pinnacle seemed to move constantly, with orange, purple and pink



*Nembrotha chamberlaini* nudibranch







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School of goatfish (above); Tiny goby (left) on sea pen

School of batfish (above); *Cuthona kanga* nudibranch (top right)

anthias. They coated the reef, and if you got close enough, they would surround you, almost blocking out the light. Sometimes it was hard to see through them to the reef and the

ed to see if it would change. While waiting, a few of us decided to go for a quick snorkel to check the current. We got in the dingy, headed over and dropped in.

As we were swimming, I was thinking to myself, what are the odds we will see a manta just aimless swimming around this reef? And then there were four, in a train, moving right past us! The cruise director called us back to the dingy, it was time to go diving.

Makassar Reef is a really long dive site, and with a quick current, divers travel a considerable distance during the dive. The current still wasn't quite strong enough when we jumped in, but it was still like flying over reef for ages and ages. We only had one manta on the dive (you only need one though, right?) But we also had three turtles, and even some blacktip reef sharks and Napoleon wrasse, while the other group of divers from our boat saw an eagle ray.

other critters, which included a considerable amount of nudibranchs, eels, lionfish, sweetlips and more.

**Makassar Reef.** Later we moved to Makassar Reef, one of two famous spots in Komodo for mantas. The current wasn't quite as strong as the crew wanted (more current means more mantas), so we wait-



## Day 4: DRAGONS!

Seeing Komodo dragons has been on my bucket list since I was in college and read Douglas Adam's book, "Last Chance to See." In it, he goes traveling to see several of the rarest and most endangered species on earth. I had never even heard of the Komodo dragon before or that they were the larg-

est species of lizard on Earth, weighing up to 70kg (150lb) and becoming three meters (10ft) long. Or that they can run up to 20km/h (12mph) and smell dead meat from up to eight kilometers (5mi) away.

The komodo dragon has two glands in the lower jaw that secrete toxins and some research



has shown the toxin may be an anticoagulant and cause muscle paralysis, or loss of consciousness, in their unfortunate prey. This correlates with the theory (which not all scientists agree upon) that Komodo dragon saliva has bacteria in it that increases the likelihood of sepsis in an animal they bite. So the dragon only has to bite its prey and then wait until the prey subsides to sepsis before getting an easy meal.

These lovely animals are also cannibalistic. In fact, after hatching, their babies hide in trees for up to two years, so they don't get eaten by adult



dragons, or potentially, their own parents. I was so excited to see them!

We took a short dingy ride from the Indo Siren to the

National Park, and park guides gave us a tour to hopefully show us some dragons. With dragon sticks in hand, we only walked for maybe ten minutes

and saw the crowd of people before we saw the dragon. I have never seen anything before that looked so prehistoric—like a dinosaur robot on display, but it was real. Constantly sticking its tongue out into the air (smelling us), it hardly moved, and even let park guides take photos of us standing behind the dragons. On the rest of the short walk, we saw one more dragon off the trail, and we saw several deer—dragon food—roaming around the park.

**Manta Alley.** Back onboard the *Indo Siren*, it was time to dive, and we were headed to



Komodo



the world famous Manta Alley. We did two dives here, and the current wasn't as strong as the dive guides wanted, but it was still magical. A manta was right below us when we jumped in, and it swam around us several times acting like we weren't even there.

reef to be cleaned. We stayed there as long as our bottom time would allow and made our way up to the alley-like treadmill. There was not much current, so we headed back to where we started and spent another 20 minutes at about 10m (30ft), with one manta that repeatedly swam around us.

We made our way to about 30m (100ft), where there was a cleaning station. Here, five mantas were doing barrel rolls and coming close to the

**Torpedo Alley.** After dragons and mantas, it had been a pretty spectacular day, and the boat moved to the southern tip of Rinca Island to an area known as Horseshoe Bay. We did the night dive at a muck site just off the beach called Torpedo Alley and even more amazing things were to be seen.

Nudibranchs, orangutan crabs, and crazy decorator crabs of all colors, were everywhere. And there were bobbit worms! Talk about your creepy nightmare creatures, this worm buries its body (up to 3m or 10ft long!) in the sand except for its

THIS PAGE: Manta rays at Manta Alley





Orangutan crab (top left) on bubble coral; Wire coral goby (above) on whip coral; Cuttlefish (left); Bobbit worm (lower left)



antennae and waits for prey to swim directly over the top of it, when it attacks! Its teeth can cut prey in half, and it has toxins it injects, which can kill prey much larger than itself. Here were things that go bump in the night—literally. There were bobbit worm antennae sticking up in the sand everywhere! It was a little creepy, but pretty awesome.

**Day 5: Horseshoe Bay**

We woke up to the sun rising and hadn't yet seen Horseshoe Bay in the daylight. The view from the boat was stunning. We were the only boat in the bay and green hills rose on all sides, with calm blue water below us.

We were only a little distance from the black sand beach we had dived the night before. And then I saw what was on the beach—more komodo dragons—right near where we had been diving

the night before! (The crew assured me that they do not go in the water unless they are really hungry... Good to know.) As we drank our coffee, we saw three dragons and a few monkeys on the beach.

I was still thinking after every dive, "It can't get any better than this," and then we saw the dive sites around Horseshoe Bay. It was by far some of the healthiest coral reefs I have ever seen. It was just life upon life upon life, with healthy hard corals, colorful soft corals, thousands of crinoids, sea fans and fish of all colors—everywhere. There were nudibranchs, cuttlefish and anemones with clownfish, too. I couldn't take enough photos, and our 70-minute



Cowfish on reef

another muck beach dive called Rhino Rocks where we saw the cutest little torpedo rays, snake eels, Coleman shrimp and a huge Spanish dancer nudibranch, over a foot long.



dives felt like only a few minutes.

We visited sites called Boulder, Cannibal Rock, and the Yellow Wall of Texas, which all had beautiful walls covered in life. I even saw the only-found-in-Komodo amphipods, which look like tiny ladybugs but live underwater. On the night dive, we did



Two baby white tip sharks hiding in reef at Batu Bolong (left); Scorpionfish and crinoids (above); Moray eel being cleaned by cleaner shrimp (right)



Wolf's pygmy octopus on night dive at Banana Island

**Day 6: Rinca, Nusa Koda and Banana Islands**

Rinca Island was as far southeast as we would go on this trip, and the crew left it up to us to choose which sites we would like to revisit on the way back to Bima. We decided to spend another day diving the amazing reefs of Horseshoe Bay. We dived the entrance of the Bay around the island of Nusa Koda, and Cannibal Rock again, as well as Rhino Rocks during the day, and had another awesome night dive at Banana Island.

One really cool thing we saw on the night dive was what I think is a Wolf's pygmy octopus. One of the world's smallest octopuses, it is red in color, and

the males have tiny filaments on the last few sucker discs of their arms.

**Day 7: Mantas and Batu Bolong**

It was time to start heading back north and west. We made a unanimous decision to stop at Manta Alley and do two more dives there. Twelve mantas showed up on both dives this time, and it was spectacular.

After that site, we headed to Batu Bolong, and although the current wasn't strong, we were once again engulfed by brightly colored anthias. One of the divers even found two baby whitetip sharks, hiding together in a hole, that were just adorable! After a hard day of diving amazing dive sites,

we decided to check out a nearby resort to have a few cocktails on the beach—not a bad way to end a day.

**Day 8: Revisiting favorites**

**Golden Passage.**

It was really nice to be able to go back to our favorite dive sites and do them again. We went back to both Crystal Rock and Castle Rock, and for the third dive, we did Golden Passage, which



had some of the strongest current we'd seen. The dive was nice and easy though, just going where the current pushed us, watching the pretty corals and fish go by.





Tiny amphipods on sponge (above); Manta ray at Manta Alley (right)



Scorpionfish resting on reef

I will admit that the perfect weather changed slightly, and we had a little rain on this day. The glassy water had changed to some small waves, which made the boat rock back and forth, with a slight creaking in the wood that made me feel like I was in an old house being rocked to sleep.

**Day 9: Gili Banta**

**Tandak Rusa.** We couldn't believe the end of our trip was already upon us, with only two dives left. Back at Gili Banta, we did a dive at Tandak Rusa, which was a sheer wall with sea fans and whip corals jetting off into the blue. Stonefish were everywhere, and I spent a long time photographing an orangutan crab, which was just in the right place.

At the end of the dive, we

were doing our safety stop in quite a lot of current, and I kept looking at the dive guide to make sure we weren't supposed to drift off with it. When I looked towards him, he pointed off into the blue. I turned the other way, and there was a manta, at least two meters across, almost right next to me. I stopped kicking in the current and drifted with the manta for a few minutes before finishing my safety stop and ascending.

**Gili Banta.** Our last dive was also off Gili Banta, and it was a pretty reef upon which we could reflect on our amazing

adventure and say goodbye to Komodo. Back on board, the crew took care of everything for us, making sure our gear was washed and dried, while we broke out some local Bingtang beer to relive our trip with our new-found friends and pretended to pack.

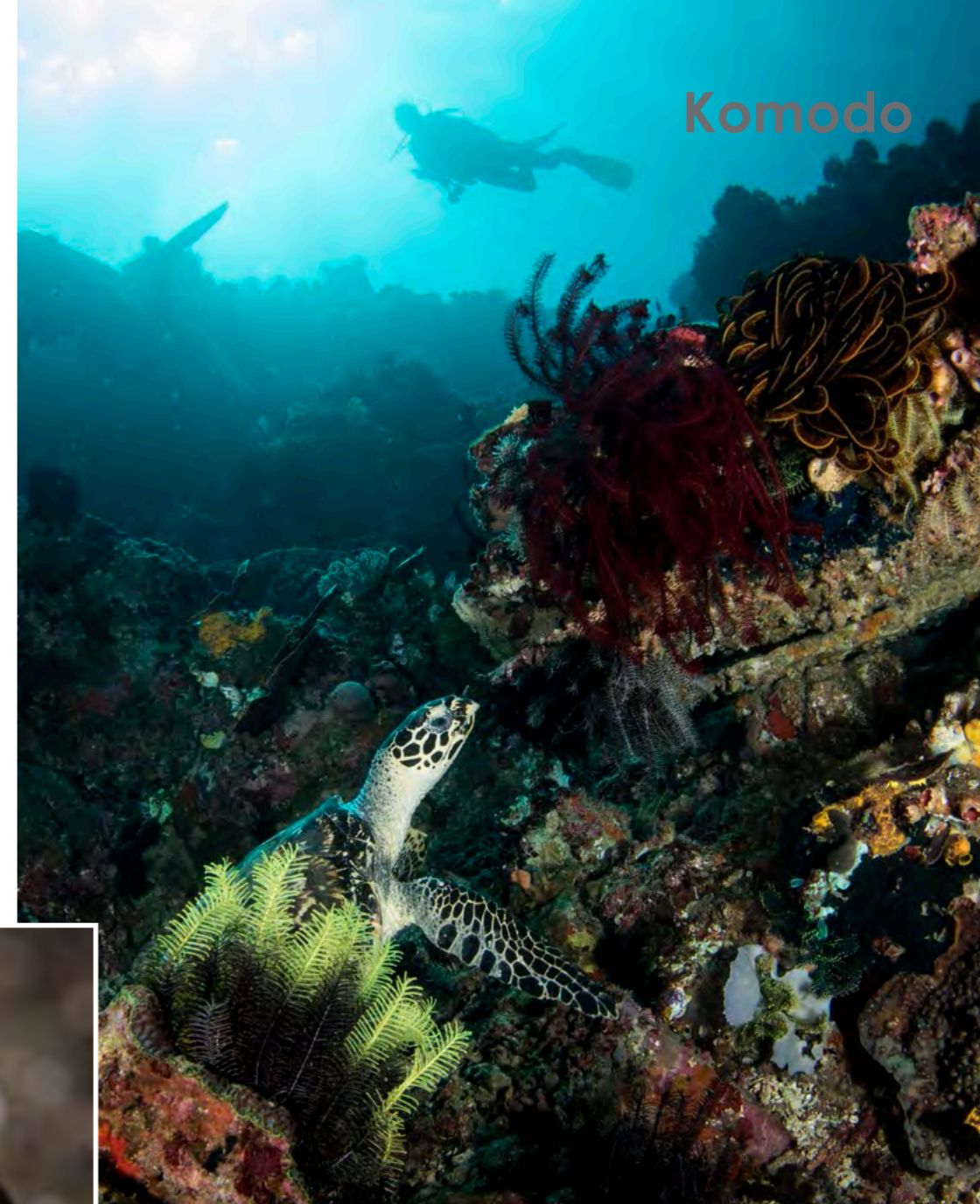
**Dive conditions**

It has been documented that the region, this year, has been experiencing a severe El Niño event. I was quite worried about diving in the cool the waters of southern Komodo and Rinca (usually 18-22°C, July through October). However, for us, the



Common cuttlefish





LEFT TO RIGHT: Torpedo ray; Moorish idols and anthias on reef; *Tambja morose* nudibranch; Diver and sea turtle on reef; Hinge-beak shrimp



Two-eyed coral fish

waters were abnormally warm, and I didn't experience anything colder than 27°C.

While I enjoyed diving in only a rash guard, excessively warm temperatures like this are not good for the reef, and we did see evidence of coral bleaching. The crew also noted that some of the critters they usually see were not present. Normally a 5-7mm wet-suit is recommended for diving Komodo, even though we didn't experience those cooler temperatures on our trip.

Much of the diving and marine life is also affected by strong currents, making diving difficult but also bringing the most life—particularly big animals. Stronger currents occur during the new and full moon, and we did not see the strong currents for which the area is usually known. Marine life was

still plentiful, and diving was easy, without much current. But I am told there is usually a lot more current than we saw on our dives, and reef hooks are a common accessory most divers usually need to use on a lot of dives.

I may have said this once already, but for me, diving is always good. But this was one of those trips where everything fell together perfectly. The boat, the crew, the other guests, amazing diving, good company, and amazing experiences have all led to some pretty fantastic memories.

I also really loved the combination of diving and a few land excursions to really feel like I got to see a lot of what the area has to offer both above and below. Just



going to Komodo was a check on my Bucket List, and I also got to check off Komodo dragons, mimic octopus, at least three species of nudibranchs I had never seen before, and I made some amazing new friends. It doesn't get any better than this. ■

*Special thanks goes to Siren Fleet for their generous hospitality and assistance ([SirenFleet.com](http://SirenFleet.com)).*

*Brandi Mueller is a PADI IDC Staff Instructor and boat captain living in the Marshall Islands. When she's not teaching scuba or driving boats, she's most happy traveling and being underwater with a camera. For more information, visit: [Brandiunderwater.com](http://Brandiunderwater.com).*

SOURCES:  
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THIS PAGE: Floating dead fish—the result of illegal blast fishing in Horseshoe Bay, part of the No Take Zone of Komodo National Park

# Dynamite fishing still a hazard in protected areas

Text and photos by Brandi Mueller

**My head was just not grasping what I was seeing, as my gaze extended across the surface of the water where fish floated upside down and sideways, all over the place. Still not understanding what I was looking at, one of the dive guides said, “Dynamite.”**

Dynamite fishing is an incredibly damaging way of getting fish quickly, by setting off small explosions on the reef. The fish die from the blast impact, with many rising to the surface because of inflated swim bladders, making it easy and quick to collect many fish. Unfortunately, this practice destroys the reef and causes many of the fish to rupture their swim bladders, sinking to the bottom (and cannot be collected). It

is also wasteful, as only the larger fish and a few species are desirable for eating. The rest are left dead and floating, while vast portions of reefs are reduced to rubble.

I had heard about this practice, read about it in my college conservation classes, and had seen it listed as a threat to the ocean. But never before had I seen the surface of the water littered with dead fish.

## Devastating impact

As divers, we scuba dive to get a brief glimpse of a world that is a large part of our planet, but at the same time, a different place from the one in which we live. But these days, it is hard to find a television program, book or magazine about the ocean without at least a succinct message about how the oceans are in danger. Overfishing, destructive fishing practices, pollution from both trash and land run-off dumping chemicals into the water, climate change—the list goes on and on. Rarely do we see first-hand, the

results of these activities. In video or film, we might see shark fins piled up on a dock, or photos of trash in the water, but it leaves one with the idea that this is happening in a faraway place.

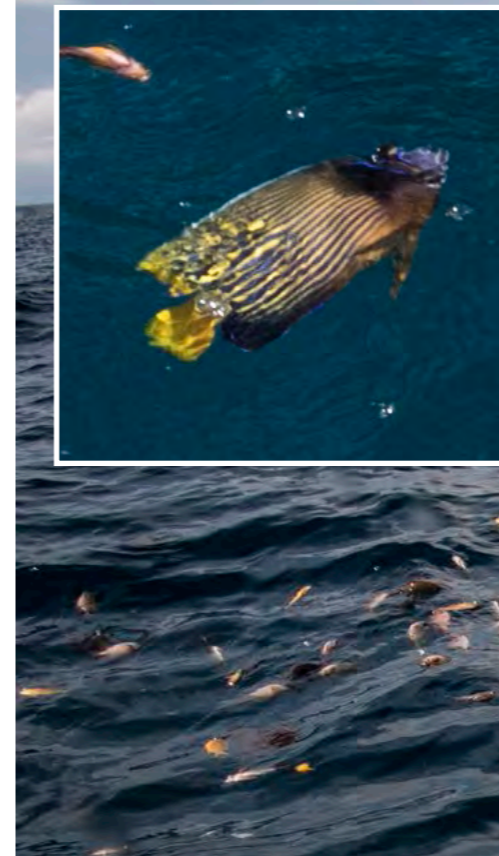
## First-hand observation

During my trip on the *Indo Siren* liveaboard, our group of divers were diving Horseshoe Bay on Rinca Island. On the second day, we had just finished a fairly epic first dive. The sun had just risen over the island hills and was shining down on the wall covered in



corals, sponges and dotted with crinoids. We had just ascended after a 70-minute dive, and with BCDs inflated, were floating in the clear blue water, with blue skies above us.

I was thinking about a small turtle we saw, which was munching on some coral, and the tiny amphipods we observed, which are only found in this region. It had been a really good dive. I had taken probably one hundred photos. We were happy and radiating post-dive bliss as we waited



for the boat to come pick us up.

The inflatable dingy made its way to our group. As we passed up fins and climbed out of the water, I looked over at the little bay and I noticed some trash had welled up in the calm outcrop—not an uncommon sight in Indonesia, or in most places, these days. Everyone was in the back of the boat, and the dingy driver pointed down into the water where there was a yellow tang beside the boat.

It must have just happened, the fish still looked perfectly intact, like they might just spontaneously recover and swim back to their colorful reef below. But they didn't.

## Damaging heritage sites

It amazes me that this is happening in Komodo National Park, which is a UNESCO World Heritage site and a No Take Zone. This is an area where tourism brings in a massive amount of money and which requires tourists to pay a park fee to “maintain” it. And it happened with our

44m(145ft) boat nearby.

We wondered if the dynamite fishers had just done it, and when they saw our dive skiffs come around the corner, they had fled; Or if they had already collected what they wanted and just left the carnage they would not even eat behind.

## Eye-opener

As you can imagine, seeing the results of blast fishing put a bit of a cloud over us all for the rest of the day. But for me, I am glad we saw it. I think it is important to be reminded that there is still a problem. The hazard is not just to fish and reef, divers have also been injured or killed by blast fishing in other parts of the world.<sup>1</sup>

This perfect, incredible, beautiful, amazing area I had just experienced is in danger still. These practices still happen. It is easy to just not think about it, or think that “it used to happen”, when in fact, it is still happening. A solution needs to be found, or wonderful dive trips like the one I just experienced on the *Indo Siren* will not

be something a person can experience again or share with others.

## Finding solutions

Playing devil's advocate for a moment, I know that some people who are dynamite fishing are doing it because they have a need to feed and support their families, with the money they gain from selling the fish.

Our solutions to the problem need to address how to better feed the Earth's current population of seven billion people. To prevent blast fishing, alternatives need to be made available for fishers, awareness must be raised, and we need to make ethical fishing gear available to everyone. The Indonesian government has taken measures to curb blast fishing in Komodo, but enforcement continues to be a challenge.<sup>2</sup>

I do not have the answers, but I have to admit, seeing one of my favorite fish—an emperor angelfish—dead and floating on the surface, needlessly killed and left to rot, broke my heart. ■

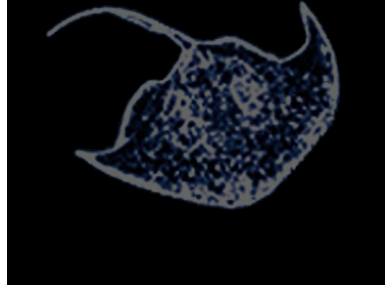
<sup>1</sup> GMANETWORK, PHILSTAR, SUNSTAR

<sup>2</sup> WORLD WILDLIFE FUND





# fact file



SOURCES: US CIA WORLD FACTBOOK, XE.COM, STATE.TRAVEL.US, CDC.GOV

## Komodo Island, Indonesia



Location of Komodo Island on global map (right); Location of Komodo Island on map of Indonesia (below)



NASA

tradition and dress modestly. Internet users: 20 million (2009)

**Language** Bahasa Indonesian, plus 253 tribal languages. English, Spanish and German are spoken on dive liveboards.

**Health** Mosquito-borne illnesses are a problem and there are cases of malaria, dengue, Zika, and other. Avoid mosquito bites by using mosquito repellent and covering up during times when mosquitos are out. Water and food-borne illness can also be a problem so be sure to drink only bottled or filtered water and that food is cooked thoroughly.

often accepted onboard liveboards and in resorts. MasterCard and Visa are widely accepted in cities and tourist areas. Major airports and cities have

**Decompression chamber** Indonesia has several hyperbaric chambers, including chambers in Bali and Makassar.

**Travel/Visa** Passport valid for six months beyond intended stay is required. There is a Visa-On-Arrival for 35 countries including USA, UK, most European and Asian countries. It is US\$25 for a stay of up to 30 days.

**Security** Indonesia has had recent incidences of terrorism and travelers should be aware of their surroundings, avoid public demonstrations, and be cautious or avoid traveling at night. Petty crime is a problem, especially in cities, and credit card and ATM fraud are on the rise. Use only reputable and marked taxis, preferably arranged by hotels or shopping centers.

**Web sites** Indonesia Travel [www.indonesia.travel/en](http://www.indonesia.travel/en) Komodo National Park [www.komodonationalpark.org](http://www.komodonationalpark.org)

**History** Indonesia is made up of about 13,500 islands, 6,000 of which are inhabited which straddle the Equator. Komodo National Park was created in 1980 to protect the Komodo dragon and it is a UNESCO World Heritage Site and a Man and Biosphere Reserve. The reserve includes the islands of Komodo, Rinca, and Padar and 26 other smaller islands. Beyond just protecting dragons, it also protects an immensely biodiverse marine environment, which makes up 67 percent of the reserve. Government: presidential republic. Capital: Jakarta

**Geography** Located in Southeastern Asia, Indonesia is an archipelago situated between the Indian and Pacific Oceans. Coastline: 54,716km. Terrain consists primarily of coastal lowlands, with interior mountains on larger islands. Komodo National Park is 1,817 sq km, with extensions being proposed. The park sits over the juncture of two continental plates which had led to earthquakes and volcanic eruptions. There are no active volcanoes in the park, but nearby Gili Banta and Gunung Sangeang Api cause tremors.

**Climate** Komodo has one of the driest climates of Indonesia, with the dry season occurring

May-October, and the rainy season, November-April. Throughout Indonesia climate is usually tropical, with hot and humid weather year-round and slightly cooler temperatures in mountain regions. Typhoons are rare. Water temperatures vary from the north and south of the park. The north of Komodo National Park the water temperatures range from 25-29°C, in the south water temperatures are 22-28°C. Temperatures as cool as 18°C have been seen in the south, however, this year, probably due to the El Niño event water temperatures were considerably warmer than normal with the coolest temperature we saw year round in Komodo but the calmest weather and the best time for seeing the most marine life is during the dry season of July-October.

**Environmental issues** Indonesia has an immense amount of important ecosystems both above and below. Rainforests cover over 57% of the land and 20% of the world's coral reefs are in Indonesian waters.

Studies have shown there are over 3,000 species of fish, over 600 species of corals in the area and reef surveys have shown the Raja Ampat Islands to have the most bio diverse on Earth and the northern tip of Sulawesi having more than 70% of all known species to be found in the Indo-Western Pacific. There are 8 UNESCO World Heritage Sites in Indonesia including Komodo National Park. The large and increasing population as well as continued industrialization has led to many environmental issues in Indonesia. Deforestation and pollution, threatens topside ecosystems and underwater treats include commercial fishing, destructive fishing practices, pollution, chemical runoff from things such as fertilizers, dredging, and climate change. This year's El Niño has caused warmer than normal water temperatures lead-

ing to coral bleaching. The waters of Komodo National Park protected but this protection is rarely enforced.

**Economy** A vast polyglot nation, Indonesia has experienced modest economic growth in recent years. Economic advances were made with significant financial reforms. In 2009, when the global financial crisis hit, Indonesia fared well compared to its regional neighbors. It was one of the only G20 members posting growth in 2009, alongside China and India. However, the government still faces ongoing challenges of improving the country's insufficient infrastructure, labor unrest over wages, and high oil prices affecting fuel subsidy programs.

**Currency** Indonesian rupiah (IDR). US dollars and Euros are

ample ATMs but they can be scare (and possibly not working) on the smaller islands. Currency exchange rates will be better in large cities like Bali and Jakarta and it may be difficult to exchange money in places such as Bima. The Indo Siren accepts credit cards, US dollar, and Euros onboard. Exchange rates: 1USD = 13,264.76 IDR; 1EUR = 14,936.17 IDR; 1GBP = 17,468.06 IDR; 1AUD = 10,102.04 IDR; 1SGD = 9,782.70 IDR

**Population** The population of Indonesia was 237.6 million in the last census in 2010. Komodo National Park has a population of about 4,000 people and just outside the park over 17,000. Religions: Muslim 86.1%, Protestant 5.7%, Roman Catholic 3%, Hindu 1.8% (2000 census). Note: Indonesia is the largest Muslim country in the world. Visitors are encouraged to respect local

# *Tropical Gem* Dominica

Text and photos by Scott Bennett

*in the Lesser Antilles*





View of of the village of Roseau from Scott's Head, Dominica (above); Dive Dominica center at Castle Comfort Lodge in Roseau (right)



Cattle egret at Indian River

**“Not the Dominican Republic, Dominica,” I corrected friends for the umpteenth time, regarding my impending trip. Then again, the gaffe was easy to understand. While the former is home to sprawling resorts and package tourism, this tropical gem in the Lesser Antilles is a far cry from its similarly-named Caribbean cousin. Billing itself as the Nature Island, its relative obscurity, compact size and pristine beauty makes for a nature-lover’s Shangri-La.**

Make no bones about it—there is no quick and easy way to get there.

Despite being in the same hemisphere as my home in Toronto, getting there proved to be a full-day expedition. Arriving at the airport at 5:30 on a Sunday morning, there was no queue and I was at the gate in 20 minutes flat. Fortunately, I squeaked through Air Canada’s stringent new carry-on baggage limitations. To ensure there were no hassles, I stuffed my pockets with batteries, cords and chargers to play it safe!

Arriving in Antigua, I had to collect my bags, go through immigration, check in again at the LIAT counter and go right back through immigration. This time I was hit with a \$60US charge for the second bag as opposed to the



\$25CA in Toronto. When it comes baggage rules, there is no logic! My final flight was only 30 minutes, including a brief stop in Guadeloupe, its high rises and modern airport in stark contrast to Antigua.

Arriving just after 8:00 PM, I grabbed my bags and ventured outside to arrange a taxi to Castle Comfort Lodge on the outskirts of Roseau, the



Citron Sponge at Dangleben's Pinnacles

THIS PAGE: Reef scenes from Swiss Cheese dive site, part of Scott's Head pinnacle complex; Divers and large sponge at Swiss Cheese (right)



Yellow tube sponge at Swiss Cheese



Divers in swim-through at Swiss Cheese dive site

island's capitol. I was perplexed to hear the trip would take 70 minutes. After all, wasn't the island only 29-miles long by 16-miles wide? It turns out, there was a very good reason. Heading inland, the road zigzagged as we traversed the island's mountainous spine. The indigenous Carib people named the island Waitikubuli, meaning "tall is her body." And a tall lady she is. Despite its compact proportions, the island is the Caribbean's most vertical, with rugged forest-clad peaks encompassing its entire area.

With yellow reflectors on the center line, it was reassuring to see where the road actu-

ally was, especially considering the absence of street lights and my driver's excessive speed. After relentless hairpin turns, Roseau's twinkling lights came into view. I discovered Castle Comfort was actually the name of a small suburb outside the city. After checking in, I discovered the restaurant was still open, so I headed over to eat. Best of all, no jet lag!

### Diving

The next morning after breakfast, I checked in at Dive Dominica to prepare for the morning's diving. Adjoining the lodge, the dive center is one of the island's oldest. On hand to meet me was divemaster Imran Pacquette, who quickly got me set up with gear. The other divers were a mixture of Americans and fellow Canadians.

With everyone ready, we set out for Soufriere Scott's Head Marine Reserve,

located nearby in the south west of the island. Dominica's coastlines have a decidedly opposing character. The eastern side is pounded by the Atlantic's crashing surf while the western shore faces more tranquil Caribbean waters. Most dive sites are found along the Caribbean side.

**Swiss Cheese.** It is always exciting diving a new location in a new country and Dominica didn't disappoint. Our first site was Swiss Cheese, part of the Scott's Head pinnacle complex and named for the maze of nooks, crannies and swim-throughs carved into the reef. Visibility was astounding, easily exceeding 40m and one of the few instances I have encountered such clarity in over 20 years of diving. Descending below 20m, Imran led us through a swim through jam-packed with blackbar soldierfish and grunts. Swimming above the reef, I

THIS PAGE: Reef scenes from L'Abym dive site; Diver with netted barrel sponge (right); Branching vase sponge (below); Sponge, Venus sea fan and parrotfish (lower right)



ing line, an easy descent led to a sandy shelf at 8m, the bottom punctuated with rocky outcrops teeming with sponges and sea fans. On one sponge, Imran pointed out a pair of frogfish. Having done most of my diving in the Pacific, I was unaware frogfish even lived in the Caribbean.

We then headed for the wall and it was truly spectacular. The array of sponges on view was extraordinary. Clusters of yellow tube sponges jutted from the walls, along with rope, tubulate and pink vase sponges. Almost electric



marveled at the diversity and colors of the corals and sponges. Although I didn't see any, barracuda are sometimes encountered here.

**L'Abym.** For the surface interval, we headed for Soufriere village. Anchoring offshore, we admired the local church's colorful steeple while next door, a sign proclaimed "Bubble Beach Spa". However, deck chairs facing a stony beach made for one odd-looking spa. Interval completed, a short boat ride brought us to L'Abym. Translated as "abyss" in the local Creole dialect, the name couldn't be more apt!

Encompassing the eastern edge of Soufriere crater, the site's distinguishing feature is an immense wall that plummets 500m from the cliffs above. From the moor-

in intensity, enormous orange elephant ear sponges glowed against the deep blue of the open water beyond. Wedged between a pair of tube sponges, a seahorse peered out, almost in defiance of being photographed. Plate, finger and knobby brain corals, black coral trees and gorgonians jostled for space on the seemingly endless wall. First days don't get much better.

**Delicious dishes**

Getting back from diving, I had lunch at the Evergreen restaurant next to my hotel. I started with a tamarind juice, pleasantly tangy with a bit of sugar to mute the tartness. My main course of braised lionfish with a Creole coconut sauce that was very tasty indeed. I was happy to be doing my part towards lionfish eradication!

Served alongside were side dishes listed as "provisions". Although I initially visualized a canteen and flares, they are in actuality



Colorful fishing boats (right) at Scott's Head Village (below); Bubble Beach Spa in Soufrière (center); Atlantic coastline (lower left) of Dominica

local roots such as dasheen (taro), yams or potatoes along with plantains or rice (or sometimes all). Although I didn't get to sample it, Dominica's national dish is the mountain chicken. However, this chicken isn't avian but amphibian, being a frog called the crapaud. Endemic to Dominica and Montserrat, it is a protected species that can only be caught between autumn and February.

### Scott's Head Peninsula

After lunch, I went on a land tour to the Scott's Head area. My driver was Martin Tarvenier, a friendly, soft-spoken fellow with an impressive set of waist-



length dreadlocks. We were supposed to stop for a snorkeling tour at Champagne Reef, named for the stream of bubbles ascend-

ing from submerged gas vents called fumaroles. Running late, we opted to head straight for the Scott's Head Peninsula.



En route, each turn revealed another spell-binding view and I had to resist the urge to ask Martin to constantly stop for photos. It turns out, divers and nature lovers are not the only ones lured by the island's natural bounty.

Hollywood has also come calling, most notably in 2005 for *Pirates of the Caribbean: Dead Man's Chest*. A number of key sequences were filmed on the island, one of which featured Johnny Depp's Captain Jack Sparrow battling cannibals on a suspension bridge.

Approaching Soufrière, Martin indicated a section of road where steep cliffs ascended on either side. "This is where they constructed the suspension bridge for the film," he said. During filming, traffic passed beneath and on one occasion, he saw Depp fully garbed in pirate attire crossing high above. Both cast and crew mingled with the residents, attending a number of island events. We soon arrived in Soufrière, an appealing jumble of colorful houses framed with lush tropical vegetation. Martin's hometown, he seemed to know everyone, cheerily greeting friends and relatives every few meters. Just down the road was Scott's Head, named for Colonel George Scott, a participant in the British invasion

that seized Dominica from the French in 1761 who later became lieutenant governor from 1764 to 1767.

We then crossed a narrow isthmus connecting the headland to the rest of Scott's Bay. Although it looked man-made, Martin assured me it was a natural formation. A steep ascent led to a lookout offering magnificent views over Scott's Head village and the entire bay. A corroded old cannon was the only indication this had once been a fort, as most of the structure had long ago collapsed into the water below.

Heading back, we stopped at Soufrière Village for a visit to the aforementioned Bubble Beach Spa and my earlier bewilderment was promptly cleared up. A wall of rocks enclosed a small pool alongside the shoreline where a sulfur spring bubbled up from beneath the sand. I only waded in up to my knees, but it was



Brown chromis and smooth trunkfish (above), French angelfish (center inset) and sand dancer (right) at Dangleben's Pinnacles

hot—not scalding, but a half-hour immersion would have left me well-done.

**More diving**

**Dangleben's Pinnacles.** The next day saw a return to Soufrière and there were no complaints from me. First up was Dangleben's Pinnacles. Named after the Dangleben family that owned the adjacent land, the site consists of five pinnacles ascending from the Soufrière crater's northern edge. Ascending to within nearly 8m from the surface, they descend to a base shelf at 18m, creating a topographical labyrinth that is home to a myriad of fish species. When the current is running, schools of jacks, creole wrasse, yellowtail snappers and barracuda can be seen.

While gearing up, I noticed one of the

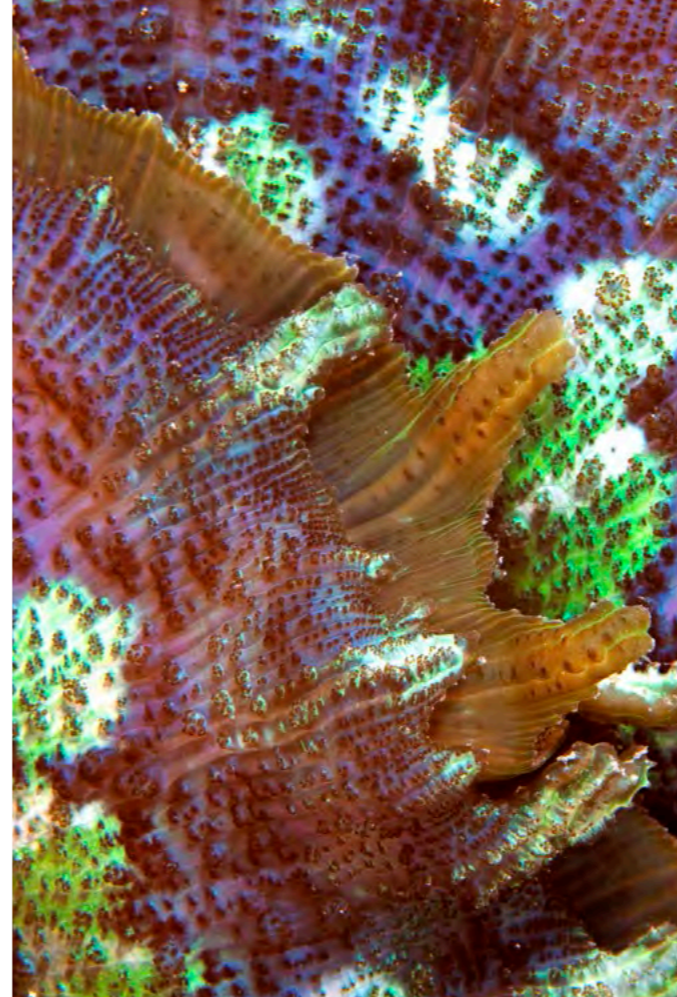
Canadian guys had a rather surprising accessory. Although spear guns would be considered unwelcome in most places during a dive trip, it was an entirely different matter here. His quarry was the Caribbean's most unwelcome visitor: lionfish. After their accidental release in Florida back in the '90s, lionfish numbers have exploded, with populations engulfing the entire Caribbean. Dominica has initiated a practical solution: If you can't beat 'em, eat 'em! Lionfish are now prominent on many a restaurant menu and a case in which all-you-can-eat is not an environmental



hazard. Although large pelagics were absent due to the mild current, there was fish life in abundance including French angelfish, princess parrotfish, brown chromis, smooth trunkfish, peacock flounder and sand dancer. Combined with exquisite sponge gardens and that 40m visibility, the dive was superb.

Sponges (top left), rope sponge and pink vase sponge (above) at Dangleben's Pinnacles





Forked tentacle corallimorph (above), spotted snake eel (top right), jack-knifefish (right) bearded fireworm (lower right) and blue-orange onuphid (far right) at Champagne Reef

**Champagne Reef.** Having missed it the previous day, I was pleased to discover Champagne Reef would be our second dive. Despite my plan to shoot the bubbles with wide-angle, Imran suggested a switch to macro. I was happy I did, as the site proved to be a superb critter dive. Starting deeper, we explored overhangs brimming with blackbar soldierfish. Imran indicated an interesting coral which I later discovered to be a forked tentacle corallimorph. Closely related to stony corals, corallimorphs feature tentacles arranged in rows radiating from the mouth. It was also a photographer's dream, with electric splotches of green interspersed between the undulating rows of reddish-yellow tentacles.

After some additional exploration, we ventured to the expanse of sand to search for critters. I had never thought of the Caribbean as being a muck-diving destination, but was very pleasantly surprised.



Thanks to Imran's eagle eyes, I discovered a myriad of subjects to photograph. The sand was alive gobies, including pallid, goldspot and sharknose, all of which readily posed for photos. Imran gestured to a bubbling vent and indicated I put my hand at the opening. It was quite warm but not uncomfortable.

The ensuing 40 minutes were enthralling. Balloonfish, juvenile blueheads, Christmas tree worms, seahorses, long-lure frogfish, spotted snake eel, sharp-nosed puffer, gol-dentail moray, tiny crabs, harlequin bass and bearded fireworms kept my shutter firing at a rapid pace. Jackknife fish were especially photogenic with their elegant flowing dorsal fins and striking black and white wardrobe. A tiny yellowface pike-

blenny displayed some serious attitude, rising from its burrow with mouth agape and dorsal fin extended to defend its territory. Kind of like an insolent toothpick!

My favorite subject was so small and peculiar, I didn't even know what I was looking at. Imran motioned me over to a glossy, almost metallic-tinted object protruding from the sand. Closer scrutiny revealed a blue-orange onuphid, a type of polychaete worm related to the infamous Bobbit worm. Dominica just kept on surprising!

Although we did not get to them, a pair of wrecks are also present—one metal and one wooden, sitting near each other between 60-95 feet. While the metal vessel has been present for years, the wooden

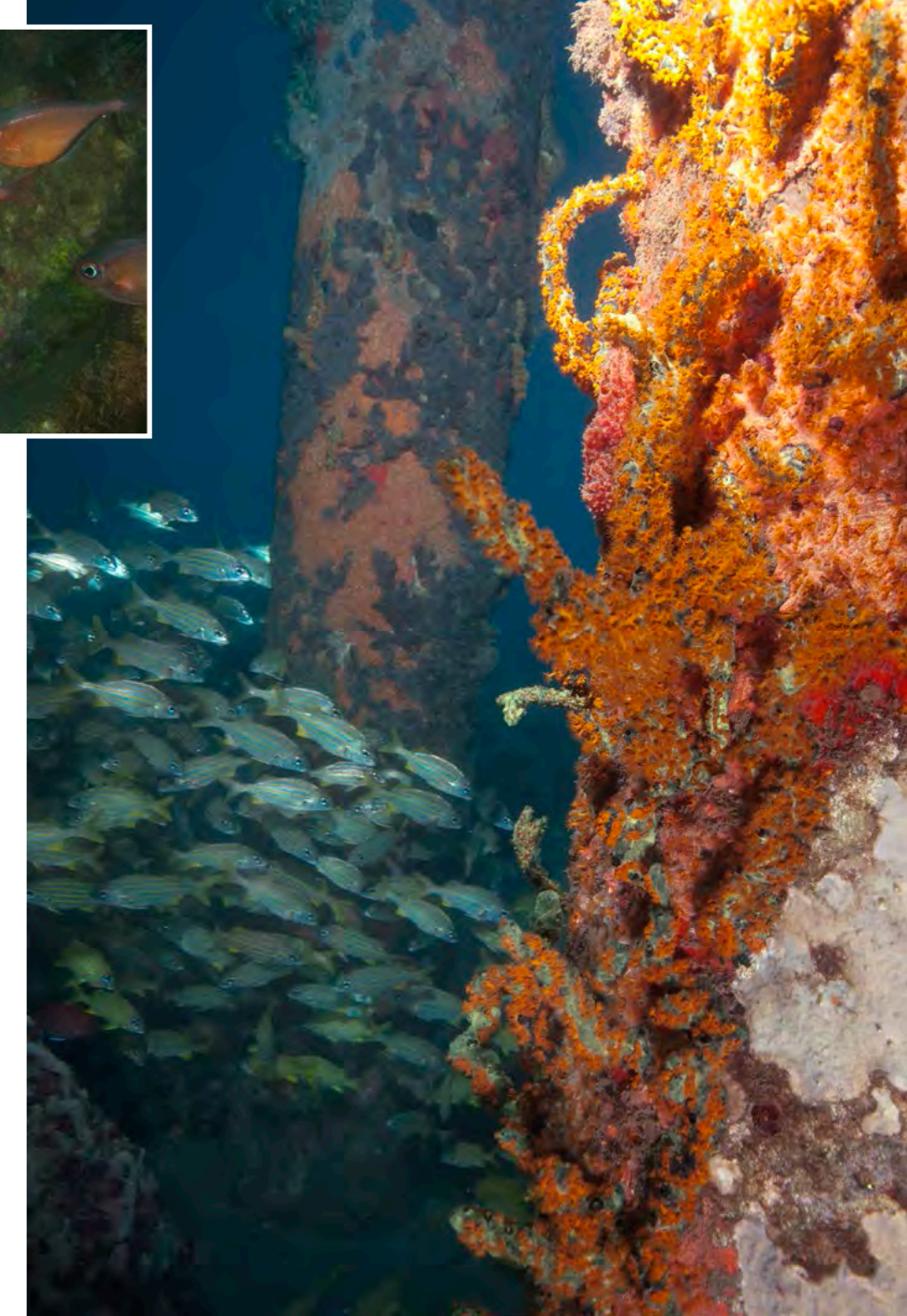
Longlure frogfish (top left) and balloonfish (above) at Champagne Reef







Schooling silversides (left), glassy sweepers and yellow-line arrow crab (above), and Caesar grunts (right) at Dive Dominica Jetty



Sponges at Dive Dominica Jetty

one dates from 1994, sunk after being confiscated from smugglers.

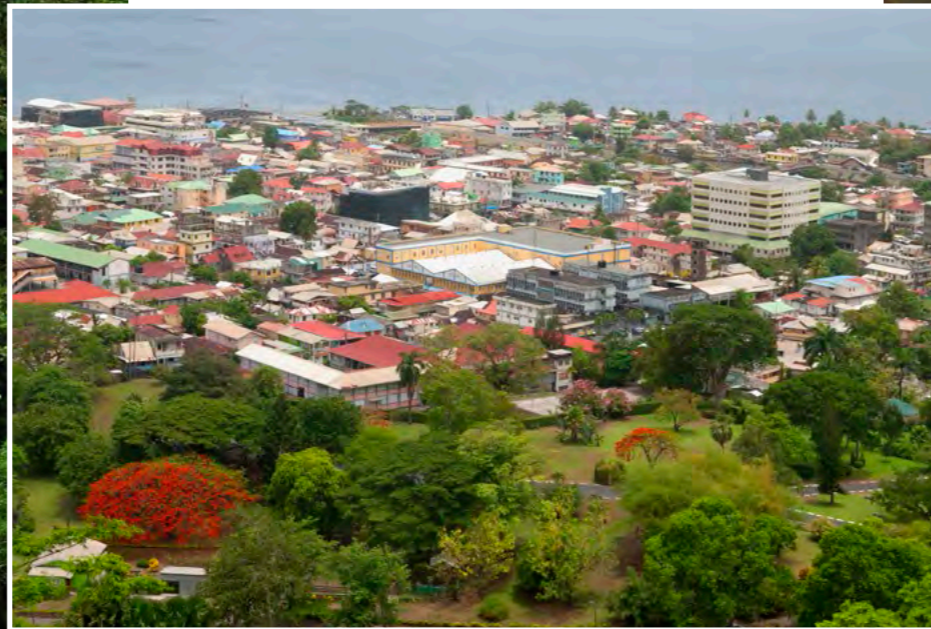
**Dive Dominica Jetty.** As Dive Dominica allows unlimited diving from its jetty, I joined the other two Canadians for a late afternoon dive. With the jetty sitting high out of the water, a giant stride with a camera was out of the question. Happily, the dive shop had a solution. Attached to one pylon was a cord with a carabiner hook attached to the other end. All I had to do was clip it to a metal ring on my housing and gently lower it into the water.

A gradual slope descended away from the jetty, with massive barrel sponges and sea plumes playing host to a variety of small reef fish. I was set up with macro but it didn't take long to find some subjects. Upon reaching the bottom, I surprised a Caribbean reef octopus that promptly made for the safety of a protective crevice. Further down, a sandy expanse was home to a large congre-

gation of garden eels but proved just as shy as their Pacific cousins. A sharptail eel proved much more receptive as it sat half-buried on the silty bottom. Nearby, a Caribbean whiptail stingray allowed a close approach before rocketing off down the slope.

After intently photographing a spotted moray, I looked up to discover my dive buddies had vanished. Not wanting to explore on my own, I headed back towards the jetty, photographing jackknife fish, rosy razorfish, harlequin bass, Pederson cleaner shrimp, boxer shrimp and spotted scorpionfish along the way. Yellowline arrow crabs proved especially prolific. Resembling pointy-headed spiders, the legs and violet-tipped claws are very long and spindly, making them especially challenging to photograph with a macro lens. Talk about a depth of field nightmare.

At dive's end, I discovered a large school of Caesar grunts congregating near the jetty's wooden pylons. Determined to get some wide-angle images, I asked if I could change tanks and go back in. I was assured it would be fine; I just had to hang up my gear as the dive shop would be closed upon my return. Heading back to my room in my dripping wetsuit, I carefully swapped macro with wide-angle and headed back down to find a full tank waiting. Despite being on my own, I assured them I would just be hanging around the jetty. While gearing up, I could see a large school of silversides milling about next to the jetty. I was in luck!



Roseau coastline (above); View over Roseau (top center); Liberation colors in Roseau (left); Trafalgar Falls (far left) is just a 20-minute drive from Roseau

My elation proved short-lived, as the silversides disappeared the moment I hit the water. Fortunately, the grunts were still there, but photography necessitated patience and a slow approach. Glassy sweepers hovered around the pylons along with the occasional trumpetfish, while the bottom bristled with urchins. With daylight waning, I

tried to get as many shots as possible. Without warning, the silver-side school erupted from beneath the jetty in a shimmering mass and I was completely enveloped. The action was so sudden, it actually made me jump! There was even an audible whoosh as they vanished entirely.

### Topside excursions

The next morning, Martin took me on a tour of Roseau and its environs. With a population of just under 17,000, Dominica's capitol is the island's largest city. First stop was The Old Market, a thriving market during colonial times where everything from commodities to slaves was traded. Mainly a tourist market these days, it is the haunt of souvenir vendors, but fortunately not of the hard-sell variety. More authentic was the nearby Famers Market, where all manner of produce was on display from mangoes, pineapples and ginger to cinnamon, nutmeg and fresh honey. Coconut water

scheme was especially prevalent. Martin called them "Liberation Colors" and they appeared on everything from walls and clothing to the seat covers of Martin's car. Known as the Pan-African flag or Black Liberation Flag, it became a nationalist symbol for the worldwide liberation of people of African origin. Consisting of three equal horizontal bands of red, black and green, the red signifies the blood shed for liberation; the black for all people of black African ancestry; and the green for Africa's abundant natural wealth.

**Trafalgar Falls.** A 20-minute drive

right from the coconut was especially refreshing on a humid morning.

I noticed one color

from town was Trafalgar Falls, one of the island's most iconic natural attractions. The twin waterfalls are referred to as the "Father" (on the left) and "Mother" (on the right). From the visitor center, it was a short and slippery downhill walk to the viewing platform. I nearly stepped on a land crab as it skittered across my path while a misty drizzle enhanced a scene that was the epitome of lush.

**Hot springs.** Heading back, we made a brief stop at the village of Wotten Waven, where a series of hot springs bubble and steam along the river bed, a reminder the island's volcanic activity is very much alive.

**Botanical gardens.** From there, we drove to the botanical gardens on the edge of the city. An especially peculiar sight was a squashed bus that looked straight out of a Coyote and Roadrunner

cartoon. Flattened by a giant fig tree toppled during Hurricane Andrew back in 1979, it was left as is and the tree has since grown on top of it.

**Whale-watching cruise.** After getting back, it was time to check out of Castle Comfort. Loading my bags in Martin's van, he dropped me off next door at the Anchorage Hotel for an afternoon whale-watching cruise. With 22 species present, Dominica is regarded as the Caribbean's whale watching capital. A mile offshore, depths plummet to over 1,000 feet, providing excellent habitat for sperm whales, which can be observed year-round. Other species include short-fin pilot, false killer, melon head, pygmy sperm, and humpback whales along with mixed pods of spotted and spinner dolphins.

Prior to departure, a briefing was conducted done next



Channel clinging crab (left), Atlantic white-spotted octopus (far left) and slumbering parrotfish (below) on night dive at Carib's Leap



Magnificent feather duster (above) and spotted moray eel (right) on night dive at Carib's Leap dive site



to a Mounted Sperm Whale Skeleton at The Anchorage Marine Mammal Interpretation Center. A mile out, we stopped at several locations, where a hydrophone was lowered to listen for whale activity. Unfortunately, the only sperm whale I saw was the skeleton back at the center. Despite an advertised 90 percent success rate, none appeared. To be fair, June was not exactly peak season for them and nature is, well, nature and not guaranteed. It was a pleasant cruise nonetheless, affording beautiful vistas of the rugged coastline. However, the trip wasn't cetacean-free—a large pod of spinner dolphin's appeared, living up to their name with a show of acrobatics eliciting oohs and aahs from the passengers.

**Night dive**

Arriving back, I knew I had a night dive

that evening, but I wasn't exactly sure with whom. It turned out, I was in the right place. I had just enough time to assemble my housing (in the hotel lobby) and proceed back to the Anchorage Dive center to be gear up. I met dive-master Sherman Julien along with a couple from the Netherlands and a Canadian woman. Our vessel was the catamaran from the whale-watching trip, a stylish way to travel to the evening's dive site.

**Carib's Leap/ Sorcerer's Peak.** The site was Carib's Leap/Sorcerer's Peak, named for the sheer 200ft cliff ascending from the water's edge. If a Carib wife was caught being unfaithful, she was taken to the top, given a farewell kiss and "divorced" by being hurled off. In a dramatic display of double standards, the men could have as many wives as

they wanted! The site has a spooky reputation, with apparitions of the unfaithful wives allegedly being seen by divers.

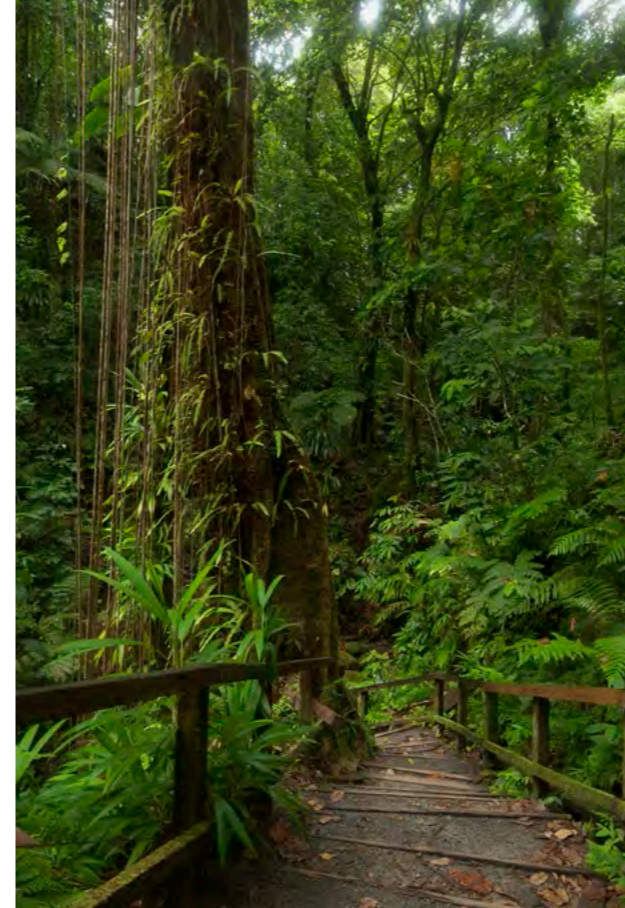
We kept the dive shallow, not descending below 8m. Immediately, I surprised a large spiny lobster that promptly vanished as I got my camera into position. Encased in their nocturnal cocoons, parrotfish slumbered as spotted morays slithered amongst the corals and sponges in pursuit of prey. Some big channel clinging crabs were especially impressive. Although we did not see a lot of fish, the reef itself was dazzling, my torch illumination revealing vibrant color not visible in the daytime. At dive's end, an Atlantic white-spotted octopus sat immobile on a sandy patch, making a perfect photo subject. No ghosts appeared though. Hot chocolate and hot towels were waiting upon our return. Nice!

**Roseau**

Afterwards, we loaded my gear into Martin's van and headed to Roseau for the Fort Young Hotel, my home for

the last two nights. Arriving in town, it was already 9:45 P.M. and I was afraid I would miss dinner. Martin suggested the Old Stone Grill, which was close to my





Path (left) to Emerald Pool (far left), located in a grotto surrounded by rainforest near the town of Roseau

## Dominica

Pool, a beautiful waterfall in a grotto surrounded by verdant rainforest. An easy walk on a level trail led to stairs leading downwards. The only negative part was knowing I would have to trudge all the way back up in the burgeoning humidity. Farewell dry clothes! However, the sheer beauty more than compensated: Moss covered boulders framed the cascading stream as vine-draped trees towered overhead. Normally jam-packed during the cruise ship

season, I had the place entirely to myself and photographed to my heart's content.

**Kalinago Barana Aute.** Entering the Carib Indigenous Territory on the Atlantic side, we stopped in at the Kalinago Barana Aute (Carib Model Village) to learn about the Kalinago People. (called Caribs by the Europeans). At one time widespread throughout the Caribbean, more Kalinago arrived on the island as the European presence increased. Today, Dominica is home to the last remaining population. A local guide took me on a tour, explaining cultural practices and history with examples of

hotel. Still clad in a wet bathing suit, I scrambled up the stairs and asked the hostess if they were still open. As the kitchen was closing shortly, she suggested I order, get changed at the hotel and come back, by which time my dinner would be ready. It was a plan!

The hotel proved to be pretty swanky. And it really was a fort, or at least set within an actual one erected by the British. Boasting plenty of panache, a lot of the old colonial architecture remains, embellished with contemporary finishes. Breaking a land speed record, I checked in, showered, changed and was back at the restaurant in 20 minutes flat. The coconut prawns and conch were superb.

My final day was spent on a circle tour around the island. Just across the street was the presidential palace, a grandiose monstrosity with giant columns totally



incongruous with Roseau's modest environs. The public outcry during its construction appeared ongoing, as I later spotted several billboards proclaiming the 27-million price tag would have been

better spent on a hospital or public education. Some things truly are universal.

**Emerald Pool.** Heading back to nature, our first stop was Emerald



Mangroves of the Indian River (above and left) appear in film, *Pirates of the Caribbean: Dead Man's Chest*



Fort Shirley (above) in Cabrits National Park; Longlure frogfish (top center) and bearded fireworm (left) at Champagne Reef; Divers and barrel sponge at L'Abym (far left)

village structures, basket weaving, cassava bread baking, canoe building and herbal medicine.

**Indian River cruise.** Venturing to the opposite coast to Portsmouth, we stopped for a cruise at the Indian River, the island's only navigable waterway. As cruises go, it was definitely no frills; with motorboats not allowed, my transport was a rowboat with guide manning the oars. Heading upriver, mangrove trees fringed the shoreline, gradually creat-

ing a canopy over the ever-narrowing river. Our quiet transport meant a closer approach to the abundant birdlife. Heading back, we made a detour down a tributary to a familiar-looking shack nestled amongst the mangroves. Movie buffs will recognize it as the home voodoo priestess Tia Dalma in *Pirates of the Caribbean: Dead Man's Chest*.

**Cabrits National Park.** Our final stop was Cabrits National Park, located

north of the town of Portsmouth. Protecting a mixture of tropical forest, coral reefs and wetlands, Cabrits is an extinct volcano that was once an island. Now connected to the mainland by sediment sweeping in from Douglas and Prince Rupert Bays, it is home to Fort Shirley, an 18th century garrison constructed by the British to defend north Dominica. Consisting of over 50 buildings housing over 600 men, it was abandoned in 1854 and deteriorated for years before restoration in 1989. The views of the coastline were spectacular.

**Afterthoughts**

With so many activities both over and under the water, I could scarcely believe my visit had been less than a week. For such

a tiny island, the attractions were many and I had only scratched the surface, especially with regards to the dive sites. I was once told that if you have dived the Pacific, don't waste your time with the Caribbean. Having experienced Dominica's beautiful reefs combined with exquisite visibility, I couldn't disagree more!

Sadly, less than two months after my visit, the island was pounded by Tropical Storm Erika. With up to 30 deaths, thousands of people displaced and hundreds of homes left uninhabitable, it was deadliest natural disaster to hit the island since Hurricane David in 1979. In the aftermath, International assistance poured and the island started its long road to recovery. Talking to Imran afterwards, I was relieved to hear everyone I met was fine and the vast majority of dive sites weathered the storm with no visible effects. With tourism a mainstay of the local economy, the best way to help is to simply go. There isn't a better time. ■

*Special thanks go to Lise Cuffy and Kirsten Boucard at Dominica Tourism.*

Goldentail moray eel at Champagne Reef

# fact file



## Dominica



SOURCES: US CIA WORLD FACTBOOK, US STATE DEPT, US CDC, XE.COM, GOV.UK, UNDP, LONDON-DIVINGCHAMBER, DOMINICA.GOV.DM

**History** Due primarily to the intense resistance of the native Caribs, Dominica was the last of the Caribbean islands to be colonized by Europeans. In 1763, France handed over possession of Dominica to Great Britain, which colonized the island in 1805. In 1980, a couple of years after independence, the first female prime minister in the Caribbean,

Mary Eugenia Charles, took office, improving Dominica's outlook after replacing a prior corrupt and tyrannical administration. She served in office for 15 years. As the only pre-Columbian population remaining in the eastern Caribbean, there are still around 3,000 Carib Indians living on Dominica. Government: parliamentary republic. Capital: Roseau

**Geography** Dominica is a Caribbean island located between the Caribbean Sea and the North Atlantic Ocean, midway between Puerto Rico, Trinidad and Tobago. Coastline: 148km. Dominica's terrain comprises rocky mountains of volcanic origin. Known as "The Nature Island of the Caribbean", Dominica is home to remarkable, lush, and diverse flora and fauna, protected by an extensive natural park system. Dominica is the most mountainous of the Lesser Antilles, with volcanic peaks that are cones of lava craters, one of which is Boiling Lake—the second-largest, thermally active lake on Earth.

**Climate** Dominica's climate is tropical, influenced by northeast trade winds and heavy rainfall. Natural hazards include flash floods and destructive hurricanes from June to November.

**Environmental issues** A national action plan that aims to conserve and maintain the fragile and economically important ecosystem of the island has been established by the government of the Commonwealth of Dominica to deal with environmental challenges, including bio-diversity and species preservation; deforestation prevention and land use management; coastal zone, water quality and solid waste management; and sustainable development and energy systems.

**Economy** In past years, the Dominican economy has largely depended upon agriculture, mainly of bananas, but ecotourism has become an important part of the government's economic plan. There is also an offshore medical education sector. An offshore financial industry is also being developed by the government in an effort to diversify the island's economy. There are also plans to sign agreements

Location of Dominica on global map (right); Location of Roseau on map of Dominica (below); Diver at Swiss Cheese Reef (lower left)



**Currency** East Caribbean dollars (XCD). Exchange rates: 1USD = 2.70 XCD, 1EUR = 3.05 XCD, 1GBP = 3.61 XCD, 1AUD = 2.08 XCD, 1SGD = 2.00 XCD

**Population** 73,607 (July 2015 est.) Ethnic groups: black 86.6%, mixed 9.1%, indigenous 2.9%, (2001 est.). Religions: Roman Catholic 61.4%, Protestant 28.6%,

with the private sector to develop geothermal energy resources. In order to respond to an economic and financial crisis and to meet IMF requirements, the Dominican government pursued several initiatives in 2003, including eliminating price controls, privatizing the state banana company, and increasing taxes. The global recession led to the contraction of the Dominican economy in 2009 and 2013, and growth remains wan.

Rastafarian 1.3%, Jehovah's Witnesses 1.2%, (2001 est.). Population below poverty line: 29% (2009 est.). Internet users: 50,000, or 67.6% of population (July 2015 est.)

**Language** English is the official language but French patois is also spoken.

**Health** According to the US CDC, outbreaks of Zika virus has

been reported in Dominica. Women who are pregnant are discouraged from traveling to Dominica, due to the risk of birth defects in babies born to mothers infected with Zika while pregnant. While not a major risk to most travelers, typhoid can be contracted through contaminated food or water and rabies is present in bats in Dominica. However, there is no risk of yellow fever. See your health department for updates and recommended vaccinations.

**Decompression chamber** Princess Margaret Hospital, Federation Drive, Roseau tel. (767) 448-2231/5720

**Travel/Visa** Visitors must have passports valid for at least six months, a return ticket, sufficient funds for length of stay and a local address. Upon leaving Dominica, a departure tax of US\$22 is assessed. US citizens do not need a visa for stays less than six months, and UK citizens, for stays less than three months. Please see the Commonwealth of Dominica website for visa requirements for your country (<http://dominica.gov.dm/>).

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**Web sites** Discover Dominica Authority [www.dominica.dm](http://www.dominica.dm)



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Edited by  
Peter Symes

# Equipment



## Nomad LS

Dive Rite has just launched a next evolution in Nomad Sidemount System. The Nomad LS is stated to be the most streamline and capable system in the family. The main improvements comprise a new adjustable bungee system, a diamond shaped wing with a "zero" baffle at the neck of the wing forcing air to the hips and a replaceable deluxe style webbing harness. With additional lift typically needed toward the lower back when sidemounting, the combination of its diamond shape and contour of the bladder create this lift achieving the optimum trim. The Nomad LS provides 15.8 kg (35 lbs) of lift.

[DiveRite.com](http://DiveRite.com)



## Bixpy

The Bixpy Jet is portable, handheld water propulsion device and - according to (yet another) crowdfunding campaign on Kickstarter - the world's first and only of its sort. Roughly the size and weight of a 1L bottle of water, the Bixpy Jet generates enough thrust to drive a 240 lb kayak with two adults against ocean tides and wind! The attachment of a Personal Battery Pack, turns the Bixpy Jet into a diver propulsion vehicle, depth rated to 30m (90ft). The running time isn't stated but the battery pack is easily detachable for quick switching. It is made from marine grade stainless steel components for use in both fresh or salt water. [Bixpy.com](http://Bixpy.com)



## Scubajet

As another new portable and universally usable jet-engine for diving, snorkeling, stand up paddle boards, canoes and dinghies, the Scubajet is marketed as "a lightweight and handy alternative to existing diving scooters without compromising in performance". Capable of providing a thrust of up to 20kgs (44 lbs) and a speed of 16 km/h. The stated battery life is 'up to 1.5 hours'. The Scubajet only weighs 3 kg (6.6 lbs.) including the Dive Adapter and small enough to be clipped onto a BCD when not in use. [scubajet.eu](http://scubajet.eu)



## AAK 180

It has some semblance to a full-face mask but it isn't one. A crowd-funding promotion on IndieGogo, states the AAK 180 Diving Mask is "the first single lens peripheral vision mask that frees your eyes to an immense under water world."

The window is made from several layers of polycarbonate to prevent deformations of objects, as double vision and image distortion. [Aakdiving.com](http://Aakdiving.com)

## Nautilus Lifeline '2.0'

The all new "Nautilus LifeLine Marine Rescue GPS" is less than half the size of the original radio. Got adrift in open water? Simply undo the latch and open, turn on, remove the red distress cap and press the red button. It is as simple as that. Your gps position accurate to 1.5 metres and a man overboard distress message will be broadcast to all AIS equipped ships up to 34 miles away as well as a special DSC message to the marine radio on your own vessel.

[NautilusLifeline.com](http://NautilusLifeline.com)





# Guadalupe Island

— *Great White Shark Adventure*

Text and photos by Matthew Meier





Panoramic view (above) of the rocky cliffs on the leeward side of Guadalupe Island, with the dive boat *Solmar V* anchored offshore; Non-diver (right) enters the shark cage for his first time breathing underwater off a scuba regulator. PREVIOUS PAGE: Great white shark breaches out of the water while lunging for the bait



Large, adult male great white shark swimming straight into the camera

**Rising out of the depths, a shape emerges from the shadows, methodically swimming in a wide arc. The outline is unmistakable, as it continues to climb and inch closer at every turn. With one last pass, seemingly in slow motion, I am struck by the sheer enormity of the creature in front of me. Visions of Martin Brody voicing his famous line, “You’re gonna need a bigger boat,” play through my head.**

Fortunately, I am not on a small fishing boat, nor is this the demonic, mechanical shark from the movie “Jaws.” Today begins my three-day adventure: cage diving with great whites at Guadalupe Island. And my excitement level is skyrocketing after the first face-to-face meeting with these massive sharks.

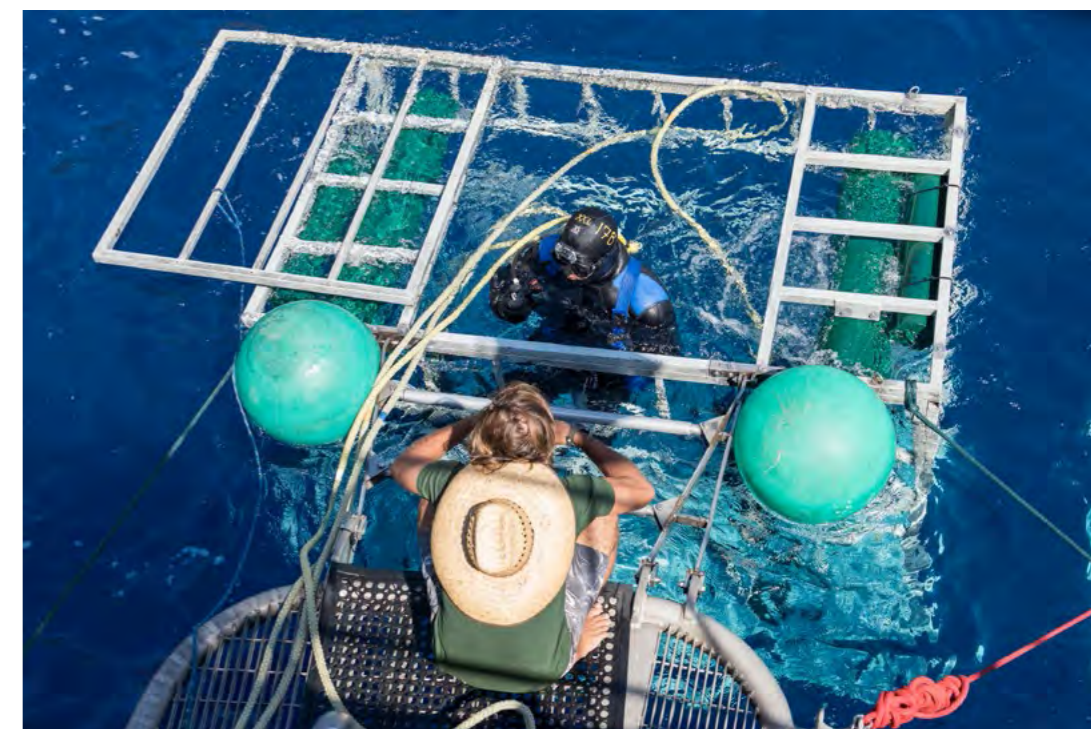
There is no way to truly put into words the exhilaration of seeing a great white shark swim past you, only a few feet away. I have jumped out of airplanes, skied off 80ft (24m) cliffs and run with the bulls in Spain, but nothing quite compares to the rush of being eye to eye with the ocean’s top predator.

Even more amazing is that

anyone can dive with great white sharks at Guadalupe Island. No scuba diving certification is required. Photographers, videographers, shark enthusiasts and adventure seekers travel here, from around the world, because nowhere else on Earth is there the warm, clear, blue waters and consistent shark sightings that have made Guadalupe Island the premier destination for great white sharks.

### Cage diving

My first experience cage diving with great white sharks was several years ago, and I will never forget the elation and slight trepidation of dropping into that water for the first time. I had



been a certified diver for nearly 25 years and witnessed numerous shark species up close in the wild, but somehow, the stigma of

the great white made this experience different.

Next to me in the cage was a young couple that had never



Several Guadalupe fur seals resting on the rocky cliffs at the water's edge (left); Large, adult male chases the bait used to bring them closer to the cages (below); A shark wrangler throws a tuna tail tied to a rope as bait (lower left)

## Guadalupe

### CLIMATE & CONDITIONS

During the months of August, September and October, when great white shark trips are in operation, the average air temperature at the island is 75°F (24°C), but record highs have reached up to 90°F (32°C). The relative humidity is steady at 80%, with an average monthly rainfall only a few millimeters. Water temperatures can be as warm as 75°F (24°C) in August and may cool down to as low as 62°F (17°C) by the end of October. A 7mm wetsuit or a dry suit is recommended for warmth in the cage.



Large, adult male great white shark lunges for bait, mouth open, just under the water's surface

seen a shark underwater, much less a great white, and in fact, they had never even been scuba diving. They were so ecstatic and animated that they could not sit still, and were bouncing around the cage to make sure they did not miss a thing.

When the first shark swam past, the cage was shaking so badly from their leaps of joy, that I could not even take a picture. The couple's excitement persisted for three straight days, though they did thankfully stop rattling the cage. I have since returned several times to see the great white sharks and still share their enthusiasm each time I visit.

### Guadalupe Island

Guadalupe Island is located in the Pacific Ocean, roughly

180 miles (~290km) southwest of Ensenada, Mexico. A few hundred fishermen, spread out over a handful of villages, live on the island at various points during the year, but otherwise, Guadalupe is largely devoid of humans.

The island is volcanic in origin, with mountain peaks rising over 4,200ft (~1,280km) out of the ocean at the northern end. Localized weather at these higher elevations creates dense fog banks, which roll over the leeward side of the island and condense moisture to sustain the island's vegetation.

Guadalupe Island is home to several species of pinnipeds including elephant seals, the Guadalupe fur seal and California sea lions. Hunted to near extinction in





Great white shark breaks the surface as it lunges for bait with its mouth open (left); From inside a shark cage near the water's surface, a diver photographs a great white shark (below)

# Guadalupe



Great white shark approaches the bait just below the surface

the mid-19th century, the seal's numbers have since rebounded under the protection of the Mexican government. Hundreds, if not thousands, of seals line the shore and their calls can be heard from far across the water. This readily available food source is likely one of the reasons so many great white sharks visit Guadalupe Island in late summer and fall every year.

### Operators

Several pioneers in the diving industry helped introduce the world to the great whitesharks at Guadalupe Island. In the mid 1980's underwater filmmakers and photographers Marty Snyderman and Bob Cranston es-

tablished a company to take guests diving with blue sharks off the coast of San Diego. Following an episode of Mutual of Omaha's Wild Kingdom, in which Marty filmed great whites at Guadalupe, they began offering white shark trips to their clients. Another innovator was Carl Roessler of See & Sea Travel, Inc., the world's first and largest travel agency dedicated to dive travel. Carl not only ran trips to Guadalupe through his agency, but he also helped manage the bookings for Bob and Marty for their blue and great white shark trips.

Today, all boats operating at Guadalupe Island begin their great white shark adventures in San Diego, California. Most transport guests by bus

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Two photographers photograph a great white shark from inside a cage (below); Great white shark breaks the surface as it turns, heading back to deeper water (right); Large, adult male swimming just below the surface (bottom left)



Photographing a great white shark from inside a shark cage

pod of dolphins and other cetaceans.

Upon arrival at the island, the boats anchor in a sheltered bay called the Northeast Anchorage, and set out their shark cages for three days of diving. Guests

since 2005. The boat offers two surface cages, which hold four divers each, and a two-diver submersible cage. All air is surface supplied via a hookah system, so guests can move freely about the cage, without the need for bulky BCs or tanks.

Divers are supplied with a 30 to 50lb (~13-23kg) weight harness, so they can stand solidly on the floor of the cage and wear only a wetsuit, boots, gloves, hood and a mask. The water temperature at Guadalupe ranges from the low to mid-70°F (~20°C) at the start of the season in August to potentially, the low 60°F (~15°C) at seasons end in October, so a 7mm wetsuit or a drysuit is recommended for warmth.

down to Ensenada, Mexico, where the passengers board a liveaboard dive boat for an 18 to 22-hour transit to the island. During the ocean crossing to and from Guadalupe, visitors have a chance to see blue and humpback whales,

take turns in the cage, typically alternating an hour in the water with an hour on deck.

The *Solmar V* was the first luxury liveaboard to operate at Guadalupe and has been shark diving in these waters

### Observing sharks

Time in the cage is spent in anticipa-



tion, scanning the blue water and the shadows lurking below. This relative calm is often interrupted by bursts of activity when a shark rockets to the surface in an attempt to eat the bait that is used to bring them close for photos and videos. The grace and power of the great whites is mesmerizing to observe as they transition from slowly swimming around the cage to turning and exploding towards the surface in the blink of an eye.

The length of a passing shark is difficult to judge underwater, though knowing the surface cage is 9ft (~3m) across helps with making rough estimates. The immense girth of the larger sharks gives a better indication to the shark's size and is even more impressive the closer they approach.

Early in the season, the populace is made up mostly of males, with the larger females typically arriving later in September or October. The younger males can

be very active and put on quite a show as they circle the cages attempting to feed on the bait.

During my most recent trip, we had three, four and even five sharks circling the cages at once. This kind of adrenaline-pumping action is nearly as much fun for the folks watching from the boat as it is for the divers, since the 100+ft (30+m) of visibility at Guadalupe Island makes it almost as easy to track the sharks from above as below. Moreover, if the sharks are actively pursuing the bait, they will often breach partially out of the water, allowing for incredible topside photo opportunities.

## Remote

One of the things I truly enjoy about traveling to Guadalupe Island, besides the white sharks, is being disconnected from the rest of the world. There is no email or phone service to disrupt you



## Guadalupe



Great white shark swims among school of scad mackerel in the blue (left); Large, adult male great white shark turning just below the surface (far left); Great white shark breaks the water's surface while chasing the bait near the cage (top center); Three great white sharks swimming in front of the cage (above)

main attraction, it is possible to see other marine life from both the cages and the boat. Schools of scad mackerel and yellowtail are often feeding on the bait near the surface, fleeing to hide behind the relative safety of

the cage when a shark appears.

Seagulls float on the surface and also peck at the bait, though they must be leery of becoming an easy meal for the sharks below. The infrequent sea lion will materialize to greet the boat and swim circles around the sharks, while large yellowfin tuna dart up from the depths for a

from getting to know your fellow passengers, sharing stories, photos and videos from your day with the sharks.

Don't feel like talking? Perhaps you would prefer to sit under the stars on a lounge chair, enjoying your favorite after-dinner beverage, as you revel in the quiet serenity of this remote corner of the

ocean. Maybe you would rather sit in the sun, watch a movie or simply curl up with a book in your cabin—whatever your pleasure, there is plenty of time to relax and recharge while on the boat.

## Marine life

Even though the great whites are the





Yellowtail swimming with a school of scad mackerel in blue water (left); Several western gulls feeding on the bait thrown in the water for the sharks (below); California sea lion swimming in blue water near the cages (bottom right)

## Guadalupe

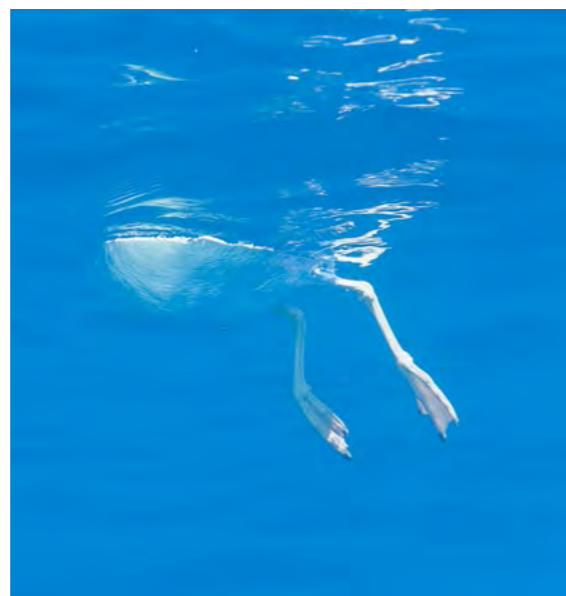


free meal. Occasionally, dolphins will swim past in the bay, and last year, we even had a sea turtle visit the bait, only to be rudely displaced by a hungry white shark.

### Options for divers

Certified scuba divers have the option of descending to 30ft (~9m) in the submersible cage to view the sharks from a completely different perspective. The cage is dropped into the water off the side of the boat and a dive master controls the ascent and descent rate by talking to a topside operator through a full-face communication mask. Once at depth, the divers can observe the sharks swimming a full 360 degrees around them and also watch the shark's interactions with the surface cages.

I think you get a better sense of the great whites' true behavior from the submersible cage, as there is no bait to entice them closer. The sharks are cautious and make slow, wide circles while they observe you at the same time as you are watching them. These are intelligent animals, with an obvious



Looking up at the webbed feet and underbelly of a western gull as it floats on the water's surface



self-preservation instinct, and they are simply not the mindless, killing machines depicted in the movies.

### Mobile cage future

The next evolution of shark diving may be from a mobile cage. If you are a fan of Discovery Channel's "Shark

Week," you will undoubtedly have already seen this device in action. We were lucky enough to get a close look at it during our latest trip to Guadalupe. A videographer from the Discovery Channel had arranged to have the cage on board so he could swim

alongside and film the great whites in open water.

The cage is driven by a pilot sitting in back while communicating via full-face mask with the camera operator in the front. I have no idea if or when regular guests will be allowed to sign up for this

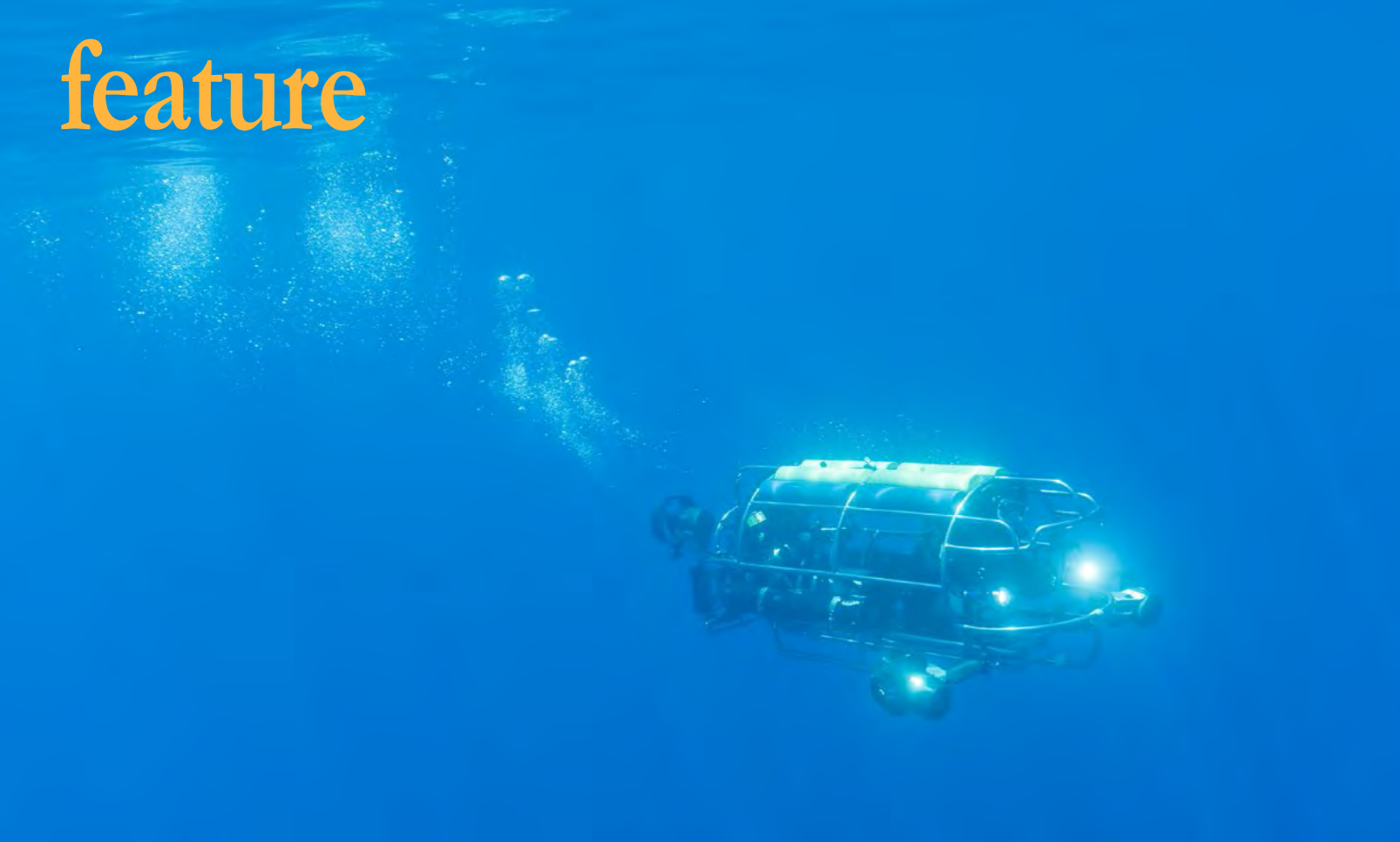


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Mobile shark cage moving through blue water in search of sharks; Great white shark researcher Dr Mauricio Hoyos works out of a small boat (top center); The submersible cage (far right) is raised to deck level, allowing an easy exit

privilege, but I know my wish list just got a little bit longer.

## Research

Several researchers have been studying the great white sharks at Guadalupe Island dating back to at least 1999. Dr Mauricio Hoyos is stationed on the island during the great white season and has been studying the shark population since 2004. The small boat that serves as his mobile office platform is often shorter than the sharks he is observing.

Mauricio's work includes tagging, photo identification, tissue biopsies and educational talks on board the visiting dive boats. He is also one of the co-founders of a Mexican non-profit organization dedicated to the conservation of sharks and pelagic species (<https://pelagioskakunja.org/en/dr-mauricio-hoyosdirector-general/>).

## Photo identification

The Marine Conservation Science Institute has compiled a comprehensive photo identification database, which has documented well over 150 individual great white sharks at Guadalupe Island. They also use satellite tags to track the shark's movements, depth and water temperature to gain knowledge of their migration patterns and behaviors. Some of the sharks have returned to the island every year since they were first identified by their unique color and dorsal fin patterns.

The scientists welcome the use of photos from the general public to aid in their research and use the photos to keep tabs on which sharks are at the island. If your submitted images reveal a new shark, you may have the opportunity to name it. I was lucky to have

a new shark identified through my photos taken back in 2010 and was pleased to name him "Maximilian" in honor of my nephew. To contribute photos to this project, please visit their website: <http://www.marinecsi.org/white-shark>.

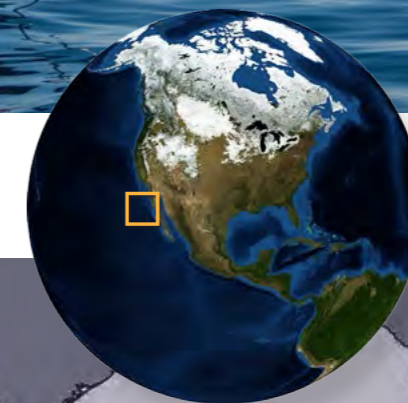
## Protection

Sharks are in need of protection the world over, and the great white is no exception. Millions of sharks are killed every year, primarily for their fins, and these fishing activities are decimating the populations of our oceans' top predators.

Officially, the great white shark is listed on the International Union for Conservation of Nature's (IUCN) Red List of Threatened Species, as "Vulnerable." This specification is only two steps removed from being declared critically endangered.



Location of Guadalupe Island on global map (right) and on map of Mexico (below)



## Guadalupe

### FACT FILE

**TRAVEL/VISA:** A valid passport is required to enter Mexico and a free, temporary Visa is issued at the border crossing when driving from San Diego down to Ensenada to board the boat.

**CURRENCY:** The Mexican Pesos is the official currency but given that all trips to Guadalupe Island originate in San Diego, California, US dollars are the default currently on board.

**HYPERBARIC CHAMBERS:** The nearest chamber to Guadalupe Island is at least 150 miles away on the mainland. Hopefully, given that most of the time you will be standing in a cage in less than 10 feet of water, the probability of needing hyperbaric attention should be very slim.

**VOLTAGE:** The voltage on the live-board dive boats can be either 110 or 220 and they will often offer both. The outlets are typically of US prong configuration.

To quote the environmentalist, Baba Dioum: "In the end, we will conserve only what we love. We will love only what we understand. We will understand only what we are taught." Wildlife encounters, like the ones with the great white sharks at Guadalupe Island, teach us to better appreciate and understand the natural world around us and encourages its protection and conservation.

If you are ready for an adventure of a lifetime, then it is time to visit Guadalupe Island and come face to face with the great white shark in its natural environment.

I promise you will walk away a changed person, with an entirely new outlook on these incredible animals. The sharks need our help and protection as much as we need the sharks for a healthy ocean and a healthy planet. This is a bucket-list trip for a reason. I hope to see you underwater at Guadalupe Island soon. ■

*The author would like to thank the Solmar V ([Solmarv.com](http://Solmarv.com)) for their amazing hospitality and support on this adventure. Matthew Meier is a professional underwater photographer and travel writer*

based in San Diego. Please see: [MatthewMeierPhoto.com](http://MatthewMeierPhoto.com).



# Bill “Hogarth” Main



Text by Howard Payne. Photos courtesy of Bill Main, GUE, Mark Powell, Lisa Burkett and the Woodville Karst Plain Project

In an poignant interview by Howard Payne, insights into diving philosophy are revealed as Bill Main—the co-founder of the Woodville Karst Plain Project (WKPP) deep cave diving team, world record breaking cave explorer, and godfather of tech and cave diving minimalism—shares his thoughts on technical and cave diving.



Bill “Hogarth” Main

With an energy that belies his 64 years, Bill Main climbed out of his car to greet me, looking every inch a child of the '60s in a Beanie hat, with wild wraparound sunglasses. He cemented first impressions by enthusing about a Pink Floyd album he had recently rediscovered, and I teased him a little about his diminutive ride. He explained to me that his Toyota

Yaris does everything he needs, and people need to start taking responsibility for the environment and the impact its abuse has had on the Florida cave systems.

In Florida cave country, you measure a diver by the size of his truck: the bigger the truck, the more important the diver. Whilst I was there, Lamar Hires (president and CEO of the scuba

equipment manufacturer Dive Rite) arrived at one of the cave sites in a Chevy pick-up truck the size of a White Star liner. Another well-known cave instructor was driving not one, but two Hummers, until his boss suggested that these vehicles were not very compatible with Dive Rite's policy of environmental responsibility.

His solution was to exchange them

both for a Ford F350 6.3 V10 pick-up truck and a Toyota Prius. I suspect the Prius languishes under a layer of dust in the garage at home, whilst the F350 is now his main ride. For those Europeans who don't speak fluent “pick-up”, an F350 6.3 V10 has roughly the same carbon footprint as a Chinese coal-fired power station but without the fuel economy.





So when Bill Main arrived to meet me at Florida cave country's most famous and popular dive—Ginnie Springs—in a tiny Toyota Yaris, the irony could not have been more perfect. As a world record breaking cave explorer, the co-founder of the WKPP deep cave diving team and a man whose middle name has become a bi-word for considered minimalism in technical diving, the Yaris was a perfect metaphor for his entire “less is more” philosophy.

*HP: Tell us when you started diving and what it was like for you in the early years.*

BM: I started diving in 1966, maybe early '67. I did my Open Water Course with NAUI—it was more of an apprenticeship back then. I made my first cave dive at night in a sideways shaft at 200ft in a quarry in around '69. It was all single tank stuff. We only got twin tanks in '72, with just a single regulator. Twin valve manifolds came shortly after that. There was no formal cave training back then. We just worked things out as we went along, and made the things we needed that didn't exist.

*HP: So you have been cave diving 45 years this year. Congratulations! Some of those early big dives must have been really hard work without helium or some of the equipment we have now.*

BM: Forty-five years almost to the day. Yes, looking back, I guess they were. Bill Gavin and I snuck Uno (Sally Ward Spring) late one night. We took minimal gear, including our “deeperised” Tekna scooters. We used to modify them with a little gas bottle that shot air

in through the plate and a Viking exhaust valve, so we could take them deep without them imploding. We knew we didn't have the right equipment, but you had to get the gear in and out fast. We really needed more stuff, but we couldn't risk getting caught. So we dropped down and headed off downstream into the flow.

Gavin was in the lead, laying line when we got to a restriction, so we had to leave the scooters.

We knew it went—it was virgin tunnel, and we had to have it. So we were both on air at 285-foot swimming balls to the wall. My wetsuit was thin as paper, with the depth. Gavin was ahead swimming like a madman at scooter speeds because

that was what the gas plan had allowed for. I got off the line at 285ft in a total silt out. I could almost cut the silt with a knife. I couldn't see. I couldn't find the line and I was buzzed out. I swear, if I hadn't been diving so long, I would have panicked and died.

So I got myself back under control, turned around 180 degrees and inflated, so my tanks were on the ceiling, and I held my sealed beam light to my chest so I could look. I started skip breathing to make my air last, and so I could hear. After about five to six minutes—it felt like forever—I could hear Gavin swimming. Maybe some of his gear was rattling and he swam right past me. I could see the orange glow of his light, so I

followed him right on out, and we got back to the scooters, which we were relieved to find, still at 270ft. After that dive, we said all deep dives would be on mix. We were the WKPP. We were the two head guys. We started trying different mixes right after that dive.

*HP: Who are the guys you respect? I guess Sheck Exley is a given?*

BM: Sheck was a remarkable guy. Even now, I still believe that the world record dive he did in 1989 at Chips Hole, solo, to nearly 11,000 feet and then all the way back out against a raging siphon, is probably a more amazing achievement than man walking on the moon.

*HP: Who else?*

BM: I would have to say Jarrod Jablonski and Casey McKinlay. I would never have the balls to do the dives they are doing now. They have really earned my respect. I remember when Jarrod was young and he turned up and we started diving together. We were decompressing on the log at 6m in Devil's Ear over there, and I wrote on my Wetnotes: “What year were you born?” He wrote me back and I replied that I had been decompressing on that log since he was three years old. Those guys used to just descend on an area and pretty much achieve whatever they wanted. John Zumrick was a very important figure and I don't feel history has been kind enough to him—a brilliant, brilliant guy.

## Bill Main

*We took minimal gear, including our “deeperised” Tekna scooters. We used to modify them with a little gas bottle that shot air in through the plate and a Viking exhaust valve, so we could take them deep without them imploding.*

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Photo by Kadu Pinheiro

# profile

HP: What are your favourite cave dives in Florida?

BM: Indian Springs. If it's clear and on a good day and you're sane, that'll be your favourite cave dive. Ask people who have dived it when it was like that, it will be 100 times out of 100 people's favourite. Sullivan is outstanding. Also Madison Blue through The Rocky Horror and beyond The Courtyard. The water clears, it opens right out, the walls are pure white, and it becomes a stellar cave dive.

HP: How did the Hogarthian equipment configuration come about?

BM: John Zumrick invented the term Hogarthian. It really started as a joke. I have always been stuck with that middle name, and then Gavin started using the term. We started minimalising—strip-ping out anything that we did

not need. Every time I saw something good—as long as it meshed with the system—I would adopt it. I was one of the first to use the Goodman handle, putting the back-up lights under the arms—lots of little things, most of them invented by other people.

HP: What do people fail to understand about diving "Hogarthian" and how does it differ from what people would consider to be a DIR (Doing It Right) equipment configuration?

BM: It is mainly being streamlined—if you don't need it, don't take it. I was glad that they changed the name to DIR because there are some differences that I still don't agree with, like having the wing inflate on the right post. I always have mine on the left, so that if the post rolls off, I know, because the inflate stops working. Speed is a big part of the equation for me. I have

From aquaCORPS archives: Bill Main (center in shirt with green stripe) chats with WKPP colleagues (right) in briefing before a dive (below)

to limit my dives. I can't stay in the water for 10 to 15 hours in a wetsuit. Also, sometimes "Chicken Little" comes calling and says, "The sky is falling down," and you just got to get out of the cave quickly

HP: If you were going to do a big cave dive like Diepolder, what would your gas strategies be?

BM: I have dived Diepolder a few times. I am a guide there. I have scootered right to the end of the deep 360ft tunnel and swum it as well. I think the last time I did it, I was using something like 13/45. For deco, I prefer 80 percent. I know O<sub>2</sub> gives you a slight time advantage, but I find it's a little easier on the lungs, and in an emergency, it's 10ft closer to you. I would use a 70ft bottle of 50 percent, as well, on the deeper stuff. People used to criticise Bill Gavin and I for diving air all the time, but back then, there wasn't any-



Bill Main

LISA BURKETT / WOODVILLE KARST PLAIN PROJECT

thing else, and I still use it for all my shallow dives.

HP: How do you tend to dive stage bottles?

BM: It really depends on the dive and what I am trying to achieve. Whether I am scootering and doing the layout of the cave, there is no fixed way—just what suits the dive.

HP: The deaths of Bill McFayden and Parker Turner in cave diving accidents must have hit everyone hard? A few of you seemed to give up the big exploration dives around that time.

BM: Not for me, but Gavin did. Parker was a wonderful guy. He wasn't my close friend, but he was a very close friend of Bill

Gavin's. You see, Bill suffered three deaths with Bill McFayden, Parker Turner and Sherwood Schille, and he unfairly got a lot of bad rap for that. There's a thing that I never went public over with the death Bill Mc Fayden, and I'll always feel responsible because I didn't say no.

Here is what really got him, and I tried to talk him out of it: He insisted on diving this cloth drysuit, on a big, difficult dive. They were awful suits. I couldn't control one, and this was his first proper dive in this new suit. As I said, I tried to talk him out of the dive, but everyone else told him he'd be okay. Sure enough, he couldn't control the suit, and he was rushing for the exit, cutting corners, off the line. I considered slashing his suit to try and control him. He was panicking, riding on the back

of Gavin's scooter, but it was too late, and in the end, he shot to the surface and got embolised.

HP: Do you need to lose someone close to you to truly understand the risks of cave diving? Are there dangers of complacency when you've been doing it a really long time?

BM: Losing someone sure gets your attention pretty quick. But listen, here's how it is: When you've made thousands and thousands of cave dives, every so often, you're going to screw up—you're human. I've stepped into water with my air switched off, no inflation, nothing to breathe. Your head only has to be a few inches below the water to drown.

HP: Are rebreathers Hogarthian?



LISA BURKETT / WOODVILLE KARST PLAIN PROJECT



George Irvine and Jarrod Jablonski at the original "Doing it Right" (DIR) Workshop in 1993

## Bill Main

### THE HOGARTHIAN CONFIGURATION

Text by Michael Menduno

The Hogarthian configuration consists of dual cylinders mounted on the back plate with a bladder-style BCD between the plate and cylinders. The tanks are joined by a separator manifold enabling the diver to isolate her left and right cylinder in the event one regulator starts free-flowing. This gives the diver a controlled reserve of air as one cylinder is emptied.

Primary and secondary regulators are mounted on separate cylinder posts, allowing the diver to switch regulators if necessary. In addition, the BCD inflator and dry suit inflator hoses are connected to separate first stages providing redundancy.

The primary regulator is on a long 7ft (2m) hose; the other is on a standard-length hose. The primary goes under the light canister worn on the right side on the waist strap, across the chest and around the neck into the mouth. The secondary regulator is located just below the chin and held in place by a bungee necklace around the diver's neck. In case of an out of gas emergency, the diver donates her primary regulator ensuring that the out-of-gas diver gets a functioning regulator.

In the past, this configuration was used solely by technical divers, but in recent years elements of Hogarth, for example, a primary regulator on a long hose has been adopted by some recreational divers. ■



Mark Powell with Hogarthian configuration

BM: Here's what I think about rebreathers: They're a lot of maintenance, and people spend all that money, then they find that every dive they do has to be a stage dive because they need a bailout bottle even just to go to The Dome Room in here (Ginnie Springs). But unlike a normal stage bottle, it doesn't get any lighter when you are not breathing it, and you can't drop it.

I reckon there are about 15 people in Florida who actually really need a rebreather: Jarrod and Casey and those WKPP guys and maybe some of the guys, like Brett Hemphill down south, who are diving deep systems like Weeki Wachee, Eagle's Nest and Diepolders regularly. At least Jarrod's rebreather doesn't have electronics, so you don't have to keep watching it all the time.

I just want to concentrate on the line and what I am doing. If you knew that you could guarantee 100 percent that a CCR (Closed Circuit Rebreather) would not fail, you would be crazy not to have one. You could do any dive you like with it and decompress, but you can't.

HP: If you asked almost any technical

diver in the world, they would know what you meant by Hogarthian or "Hog" rigged. There's even a dive equipment company named after you now. Did you ever expect the equipment configuration that you guys developed to be so widely adopted, not just by cave divers, but also tech divers the world over?

BM: I never would have guessed it, and I never set out to do it. Just like Gavin and I setting up the WKPP and then Parker Turner coming in and incorporating it, I just happened to be sitting there at the time and got lucky.

HP: You have had plenty of exploration successes and records over the years. In 1988 you broke the world record for a traverse with an 8,500ft dive, from Sullivan to Cheryl Sink up in the Leon Sinks system, and I believe you discovered The Pit in Nohoch Nachich out in Mexico?

BM: The credit for the traverse really must go to Bill Gavin. I wouldn't have attempted it, but he thought it could be done, and we gave it a try. I physically made the connection. I looked over and there

was our other line—a great moment.

Finding The Pit was a complete accident. Mike Madden and I were separated from George (Irvine) and Bill Gavin in a silt-out, and Mike was tying off the line, so I moved over to this room to make him wait and let it clear a little. When I looked down, the floor had just gone from 30ft to 240ft, so I flashed Mike and he shot over like, "Oh [expletive], are we gonna die!" I had only moved over to the room to slow him down and let things clear a little. I was so excited, I had to control my breathing, then he saw it too, and it was like his face was shot with electricity. We shook hands.

HP: Nothing like new cave, eh? I love Nohoch...

BM: Oh, I tell yah! I wasn't even meant to be there. I was just in the right place at the right time again.

HP: From your comments earlier, I was surprised to hear that you are still exploring and adding line in well-known systems, like Madison and here at Ginnie Springs.

BM: We added more line in here (Ginnie Springs) only a couple of weeks ago—about 1,500ft beyond the Henkel.

HP: Do you think GUE (Global Underwater Explorers) has done a good job with the legacy of the early WKPP pioneers like yourself, Turner, English and Gavin?

BM: Oh I think so, and after all, they did some of the biggest dives in the world, at the time.

HP: I gather you're not a huge George Irvine fan, however?

BM: A lot of things George says, he doesn't mean. He just says it for reaction and to get into the banter. I don't bear him any grudge—he's a very witty guy.

He did manage to "turn" on everyone, at one stage or another, and there were a lot of lies. I tried to stay out of it.

Bill Gavin and Lamar English wrote an article on the Deepstop Forum called, "Setting the Record Straight," to try and redress some of what he said. There is a lot of true history there. Jarrod has always been a good guy. I don't blame him for getting involved with him. It seemed to me that it was all about money and George had plenty of it. Since he quit, the KPP has made way more progress under Jarrod and Casey than when George was in charge. Some of the things he said when Rob Palmer died were unforgivable.

HP: A diving friend of mine who works for the government back in the UK says there is more politics in diving than there is in politics. It seems particularly bad amongst Florida cave divers. You seem to stay off the Internet and try to keep away from all that.

BM: Oh, it's terrible. It really is. I do try to stay out of it all. I only had a high school education. I am proud of every "C" I got. I leave the arguing to other people and just go diving.

HP: I always struggle to explain the magic of cave diving to friends—even fellow divers who have never tried it. What do you think?

BM: I still remember the excitement the first time I hit 1,000, 2,000, 3,000ft. I always loved seeing what was around the next corner, and the challenge of getting the equipment right and safely pushing your limits. We move in a medium 800 times denser than air. There is

COURTESY OF MARK POWELL



no tougher sport, in my opinion.

**HP:** What advice would you have for any readers starting out in cave or technical diving?

**BM:** Keep it simple and streamlined. Just take what you need and nothing more. If you don't, that's where your air goes—that's where your energy goes, right there.

### Diving with Bill

After the interview, Bill and I performed quick bubble checks, having dropped into the water by the Turkey Roost. Then we headed over to the small circular shaft that leads down into the Devils Eye entrance to the system. I was surprised to find that Bill dives a tight, custom-made two-piece wetsuit, instead of the membrane drysuits now used by the vast majority of cave divers. He later explained to me that the wetsuit leaves him a little cold on longer dives, but it is much more streamlined through the water, and the extra speed it gives, compared to a drysuit, is worth the sacrifice.

Bill threaded effortlessly through the series of restrictions that make up The Eye, and we entered The Gallery—the system's first big room. With myself in second and my dive buddy and photogra-

pher, David Martin, bringing up the rear, it becomes evident just how effective Bill's whole philosophy really is. I have never been diving with anyone as quick as he is, in the water. Divers with good technique, a third of his age, would struggle to keep up. Bill had already assured us that he had taken things slowly, and I did not doubt he was being true to his word. But with the camera rig in tow, we struggled a little to stay with him.

We shot some stills in The Big Room and then headed for home, finding ourselves back in the entrance to The Eye, around 70 minutes later. I watched Bill decompressing at 3m—motionless, out of the flow, on his favourite spot. He must have spent literally months of his life in this same familiar place, the rock almost bears an imprint of his body.

He switched between his primary and backup regulator on decompression, checking that everything was working fine, feeling for the same familiar, comforting patterns that told him, all is well. Few divers could be more in tune with their equipment. It is almost like it becomes a part of him.

### Bill's philosophy

For a man who is so closely associated with the birth of the DIR-style of cave and technical diving, with its use of teams of support divers and large reserves of gas and equipment for major exploration projects, Bill's entire philosophy is the very antithesis of this practice and the undoubted results it can achieve.

From talking to Bill, I came to realise that Hogarthian is truly about one man developing a system to carry out the

cave exploration he loves, with the minimum quantity of divers, equipment and gas, and within the tight time frame and budget available to him. Ironically, in this sense, Bill perhaps has more in common with the great UK cave explorers, like Stanton, Short, Mallinson and Volanthen, who tend to dive solo, or in small teams of two.

Bill's old dive buddy and co-founder of the WKPP, Bill Gavin, used to be something of a philosopher when he wasn't inventing the DPV Scooter that bore his name. Gavin used to say that great cave divers had "true heart". He had a red heart with "true" written through it, painted onto the nose cones of all his own scooters. No explanation of Gavin's eccentric wisdom was ever needed. If you had "true heart", you just understood what he meant.

### Afterthoughts

As our time together drew to a close, I was struck that Bill, who first set fin in a cave the same month that Neil Armstrong set foot on the moon, still has that passion driving him to find out what is around the next corner. He is still laying line in caves which most people consider fully explored, and still sharing his passion for the sport with other people, so graciously. "True heart" indeed, the phrase may have been invented for him.

### The Hog's Hog Rig

The original Hogarthian Rig is probably the most copied technical diving rig, ever. Bill still uses the original '60s US Divers Aqualung Conshelf regulators, which have no poppet to fail, just a simple metal stem going into an orifice. One of them is older than I am. This theme of absolute minimalism carries through everything he uses. And from observing him first hand for a time, the words "fastidious perfectionist" sprung to mind.

The foundation of Bill's setup is a Dive Rite stainless steel plate, with his signature Oxycheq Razor 50lb wing (ultra-

streamlined with only a single bladder—in his words, "made of Rhino hide"). His stage and decompression bottle regulators have no pressure gauges. He has been diving so long that he simply knows how long a bottle will last and believes it removes a significant potential failure point. All the hoses are custom lengths to reduce drag.

For lighting, he uses a Dive Rite 10w HID on a Goodman handle, with simple Princeton Tech backup lights, which he likes because the bulbs are widely available. His main cylinders are the classic US cave diver's choice of twin 104's (16.5L each), which are joined with a custom manifold without an isolator. He claims that isolators introduce another potential failure point, and he has never had or even seen a manifold failure in 45 years of diving.

He removes a lot of the risk from this

bold decision by over-maintaining his own cylinders and manifold, regularly changing tank neck O-rings and servicing the manifold and valves, which he does himself, along with all his other equipment. The 104s are joined with thick custom bands, which further reduce the chances of any leaks.

Bill's primary regulator comes off the right post, whilst the wing, backup and SPG (submersible pressure gauge) come off the left. He points out that the original WKPP way to route hoses is with the wing off the left post, so that a roll off kills your inflator and you become aware of it earlier. He strongly prefers this to the DIR "wing off the right post" method. ■

*Howard Payne is a PADI Master Scuba Diver Trainer with Dive Wimbledon, a PADI 5-star dive center in London, United Kingdom.*



LISA BURKETT / WOODVILLE KARST PLAIN PROJECT

Cave divers of the Woodville Karst Plain Project (WKPP)





*Unique Dive*

# Yellowstone

Text and photos by Jennifer Idol

— *An Extreme Experience*



Turquoise Pool (above) and Great Fountain Geyser (previous page) at Yellowstone National Park, Wyoming, USA

**A volcano larger than the US states of Delaware and Rhode Island combined, Yellowstone National Park is a geothermal hotspot that attracts more than four million visitors a year. Wildlife roam the landscape freely in this caldera, defined by ongoing thermal activity. In this unique landscape, opportunities for exploration above and below the water line abound.**

Yellowstone National Park is a remote wilderness. The closest major airports are six to eight hours away by car in Salt Lake City, Utah, and Denver, Colorado. I started the 24-hour drive from Texas at dawn with my buddy Doug Harder. We watched as flat plains in the Texas panhandle gave way to Rocky Mountains in Colorado. We completed our drive the first day as the moon rose and continued our journey the next day.

On the second day of driving, we looked left as we neared Yellowstone and noted the Grand Teton



Mountains towering over Jackson Hole Valley, an impressive destination. We finally reached the south entrance, an hour north of Grand Teton National Park. Entering the park feels like reaching the edge of Texas and having hours of driving ahead before reaching the final destination.

Slow speed limits protect people and wildlife. Either may jump out from the forest at any moment. I booked my tent site at Bridge Bay Campground, another hour from the south entrance. We headed west past the impressive Lewis Lake and then north along Yellowstone Lake, the largest lake at high



Yellowstone Lake (above) at night—it is the largest lake at high elevation in North America; Diver Trey Lessard (top right) enters the water at Bridge Bay in Yellowstone Lake; Location of Yellowstone National Park on US map (left)



# unique dive



Wildlife abounds in Yellowstone: elk (above) and grizzly bear (left) in Hayden Valley

elevation in North America. West Thumb Geyser Basin hurled steam into the air on the south side of the lake.

Yellowstone is one of the world's largest calderas. It feels flat and strange compared to the surrounding landscape. The last eruption destroyed the mountains in the center and only left mountains on the park's perimeter. Nonetheless, the lowest point in elevation is 1,610m (5,282ft) and our dive would be conducted at 2,357m (7,733ft).

## A storied history

Evidence from archaeological sites shows people have inhabited the area for more than 11,000 years. When Europeans first visited the region in the 1800s, they were so moved by the proliferation of life

they first called it "Wonderland".

Individual ideas and actions make a powerful difference for the world around us, as seen in the history of people's appreciation for Yellowstone National Park. It is the world's first national park, established 1 March 1872. More than 100 nations have since created an estimated 1,200 national parks or equivalent preserves.

This beginning of park development led to other parks in the United States, which then led to the creation of the National Park Service on 25 August 1916. We celebrate the centennial of our national parks this year because Yellowstone National Park was deemed an area worth protecting from development and misuse and led to the protection of other important resources.



View of Yellowstone River in Hayden Valley (above); Lower Falls at Artist Point (top right)



# unique dive



Turquoise Pool (above) near Grand Prismatic Spring—a year later its color has changed (see previous page) due to damaged bacterial mats; Daisy Geyser erupts (right)



Old Faithful erupts (above); Upper Falls (right)

Yellowstone has also been designated a UNESCO World Heritage Site and a biosphere reserve. This means Yellowstone is part of a network of reserves devoted to the conservation of nature and scientific research and is part of a select list of globally protected areas whose natural and cultural resources benefit all people.

### Too hot to touch

The geysers and thermal features throughout the park are the most visible reason for a storied history of fascination with this wilderness. More than half the world's geysers and 10,000 thermal features are found in this world of extremes. Water temperatures range from 257°C (459°F) in Norris Geyser Basin to the cold waters of Yellowstone Lake at 5°C (41°F). This makes the world's first national park an unlikely destination for diving, yet I return annually.

Since thermal features are dangerous and often reach temperatures above boiling point, swimming is limited to Firehole Canyon near Madison Junction. The most injuries and deaths in the park are due to thermal areas. Every year I visit the

park, I read park news and notices. The park issues alerts for areas closed to the public and new rules. This year, five notable incidents in the park became national news.

The first incident involved a person



## Yellowstone

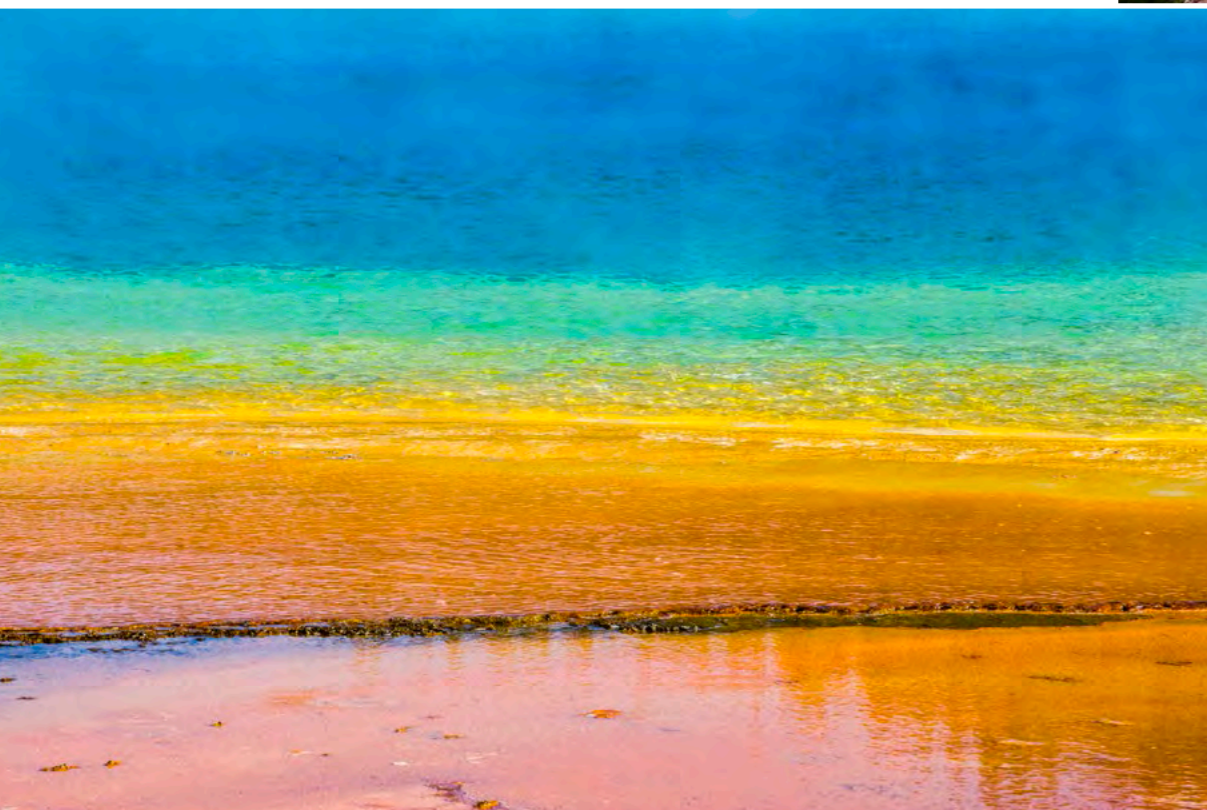
who died when they left the protected boardwalk and fell through thin crust into a hot spring in Norris Geyser Basin, the hottest thermally active area. Although the landscape looks solid, it is a wild and unpredictable land. Even scientists and park rangers who study the area cannot predict which areas

are solid ground or fragile crust. Additionally, between 1,000 and 3,000 earthquakes shake Yellowstone and change geyser behavior every year. Old Faithful is named for its predictable eruptions. Seismic activity has changed the eruption cycle, so the interval between eruptions seems to be increasing. Predictable geyser times are listed at the visitor center in the





# unique dive



View overlooking Grand Prismatic Spring (above); Minor eruption of Castle Geyser (top left)

Old Faithful lodge area. Each lists the expected time of eruption, plus or minus time when the geyser could possibly erupt.

The second most recognized feature, Grand Prismatic Spring, also experienced two national incidents. Fortunately, no one was hurt in either. However, a group of amateur videographers left the boardwalk and irreparably damaged the bacterial mats that provide the color surrounding the spring to share their adventure through social media. It can result in a \$1,000 fine to leave the boardwalk.

The spring features unreal colors. The bacteria that form the colors around the pool display colors depending on the temperature in which they grow. Another unfortunate incident may change those colors over time. A drone flew across the spring and lost contact, then falling into the center of the spring. Anything that falls into a thermal feature is irretrievable due to extreme temperatures. Objects in springs block the flow of water and cool their temperatures, causing man-made change. It is a felony offense to

fly drones in any United States national parks.

### Defined by water

From geysers and springs to lakes and rivers, Yellowstone National Park is defined by water. Glaciers from the last two million years and up to 14,000 years ago shaped Yellowstone Lake. Yellowstone River flows from Yellowstone Lake through Hayden Valley and carved the Grand Canyon of Yellowstone. Upper and Lower Falls are two of more than 290 waterfalls in the park, and are the most



Large leaf lupine flowers

Thermophiles in Grand Prismatic Spring at Yellowstone National Park



# unique dive



## TIPS FOR THE ADVENTURER

- Save money and experience two parks by purchasing an annual parks pass.
- Bring a light jacket in the summer and heavy winter clothes the rest of the year.
- Make lodging reservations one year in advance.
- The nearest SCUBA shop is Yellowstone Divers. Advance notice is needed for equipment and may need to be rented from shops in Salt Lake City or Denver. Bringing all equipment is highly recommended.

impressive. Lower Falls descends 94m (308ft) into the canyon.

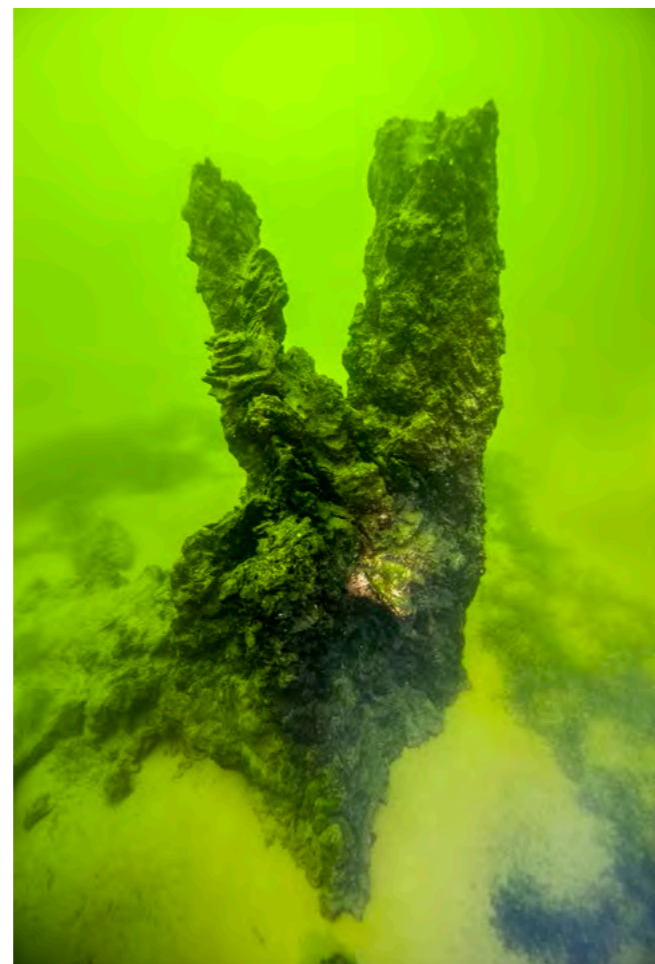
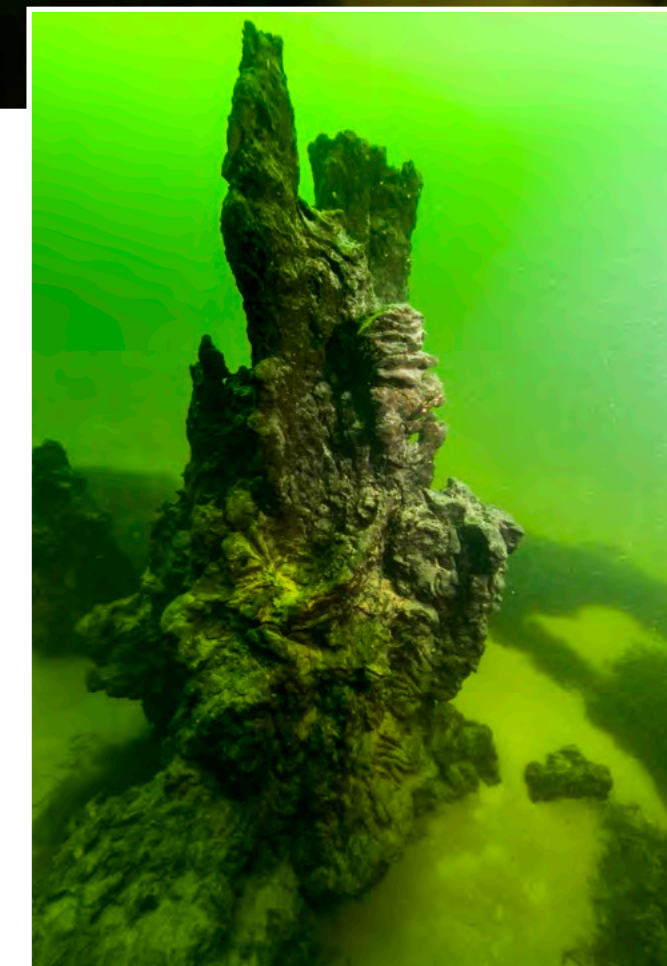
I dive Yellowstone Lake to explore siliceous spires in Bridge Bay, an unusual feature created after the last glacial retreat, that rise up to 6m (20ft) from the bottom. They look like solidified smoke that squeezed through a chimney. The delicate spires are thought to have formed while underwater and are surrounded by bacterial mats.

Diving in special bodies of water like Yellowstone Lake is an adventure. Yellowstone Lake reaches a

## Yellowstone

maximum depth of 131m (430ft), so can accommodate any dive plan imagined. I usually plan shore dives, but could rent a boat from Bridge Bay Marina. While this is a cold water dive at altitude, I enjoy the good visibility and exploration. The lake is enormous and makes me feel like a piece of straw in a hay field.

Few visitors experience the park's underwater resources, and because of this, the lake can reveal surprising finds. I observed round balls of algae, which I confirmed



THIS PAGE: Hydrothermal siliceous spires in Yellowstone Lake; Diver examines a spire (top left and far right)

# unique dive



## Yellowstone



CLOCKWISE: Muskrat taking vegetation to nest; Yellowstone Lake shoreline; Nostoc cyanobacteria in Yellowstone Lake; Red fox near Yellowstone Lake

were nostoc algae balls known as a cyanobacteria. They are reported to be successful nitrogen and carbon fixers. Yellowstone Lake is also home to the largest population of wild cutthroat trout in North America, which can be seen returning to spawn in the lake mid-summer as they jump over the LeHardys Rapids on the north side.

Diving activities are bound by regulations specific to individual bodies of water. Each national park follows independent diving guidelines. Diving with a dive flag is mandatory in Yellowstone. Park rangers require divers

all divers must be certified.

### The wild side

Wildlife thrives in the park because of their access to fresh water. Bison congregate around thermal features in winter to keep warm. A keen eye is pertinent to finding wildlife. However, another good indicator in the summer is to find parking areas full of cars. A bison, elk or grizzly bear has likely been spotted and visitors linger to catch glimpses and photos of these encounters.

It may feel like the wildlife is tame

to check-in before and after dives at the Bridge Bay Marina station. Park rangers are helpful and a useful topographic map of the lake hangs in the office. No solo diving is allowed and

because of the animals' close proximity, but they are not. Each animal requires its own personal space; and the law requires 91m (300 ft) distance from bears and wolves, and 23m (75ft) from all other animals, including elk and bison.

### An extreme experience

Impossible life persists in the heat of springs and geysers, providing almost unnaturally saturated colors. Fish and other aquatic species inhabit frigid waters in Yellowstone Lake and all animals must survive serious winter conditions. I am awestruck by the diversity in this landscape and dwarfed by its scale and complexity. ■

*Jennifer Idol is the first woman to dive 50 states and author of An American Immersion. She has earned more than*



*27 certifications and has been diving for 20 years. Her underwater photography and articles are widely published. A native Texan, she creates design and photography for her company, The Underwater Designer. For more information, visit: [uwDesigner.com](http://uwDesigner.com).*

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AnAmericanImmersion.com

Available on Amazon

Discover how an oil spill inspired a woman to undertake a quest to become the first woman to dive all 50 states and explore vivid underwater landscapes in this revealing book.

50 THE UNDERWATER DESIGNER PHOTOGRAPHY & DESIGN



# opinion



Text by Simon Pridmore  
Photos by Brandi Mueller

Over the years, many people have come into the scuba diving industry driven by a dream. This dream is to find a small, sunny corner of the world where the reefs are healthy and where they might set up a little dive resort.

The resort would be built by village craftsmen and designed to leave as small an ecological footprint as possible. Materials would be sourced locally, without destruction of either reef or forest. The use of plastics and chemicals would be minimal, and the sewage and trash disposed of responsibly.

People from neighbouring villages would be trained to work in the resort, providing them with employment, twenty-first-century skills and wealth. They would consequently abandon unsustainable practices such as cyanide and dynamite fishing, and have a vested interest in keeping trawlers and long-line fishing boats out of surrounding waters. The ocean would thrive and healthy reefs and plentiful fish stocks would keep happy divers coming, so the resort owners and local people would thrive too.

## Compromises

Inevitably, those who pursue this dream are

### Scuba Confidential:

# No Dive Centre is an Island

— *Involving the Local Community*

confronted by difficult decisions that force them to weigh their good intentions against business interests.

Some of these decisions involve environmental considerations. For example, do you have to provide guests with packaged food and drinks such as pot noodles, cookies, beers and sodas, despite the trash issues these create? Or can you still attract customers if you only offer locally sourced food and fruit juices? Given limited fresh-water supplies, do you need to provide a shower and toilet in each room or would the guests object to having to share bathroom facilities?

But the most crucial decisions involve people. For instance, it takes time to train

rural villagers who possess limited language and hospitality industry skills to become capable managers and dive leaders, so you have to make a decision. Either wait until the villagers are ready or import your key staff from elsewhere instead.

The easiest and fastest solution is to import. You want to start recovering the costs of setting up the resort as quickly as possible and you rationalise the decision by telling yourself that, over time, you will train local people

to replace the imported staff. However, it is unusual to find a dive operation where the senior personnel are actually local. This means that, with the exception of a few low-level workers, the community as a whole does not end up sharing the interests of the dive operation.

No dive centre is an island and failing to involve the wider community closely and completely can have adverse ramifications for you, your business and the marine environ-

*... it is unusual to find a dive operation where the senior personnel are actually local. This means that, with the exception of a few low-level workers, the community as a whole does not end up sharing the interests of the dive operation.*

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# opinion



ment. That part of the dream that involved local people doing things like conspiring with you to ensure thriving reefs is lost.

Here are a few stories that clearly illustrate the problem. All come from Indonesia because this is the region I know best, but the issues are international and similar tales are told worldwide wherever people dive and there are still fish in the sea.

### Gone tomorrow

A few years ago, a luxury coastal resort in Indonesia decided to tether a small platform to the seabed 20km offshore to act as a fish aggregation device (FAD) for a deep-sea sport fishing operation that they were running. The FAD was wildly successful and the guests would catch prize sport fish such as sailfish and wahoo out there. The FAD also attracted a lot of sharks and became an exciting place for both freedivers and scuba divers to visit.

The resort was very proud of the success of the FAD, which had enhanced the guest

experience, created a sustainable fish stock enabling the resort to become self-sufficient in seafood, provided employment for more local boat drivers and guides, and embellished their ecotourism credentials. So, brochures and press releases were produced and social media made sure the news travelled as widely as possible.

One day, a fishing boat was seen on the horizon as the hotel's dive boat was head-

ing back to base. The next day, the sharks were gone. In just one night, the long-liner had managed to scoop up every single one. The number of big fish around the FAD also plummeted over the coming months.

A similar episode recently took place in the north of Bali when a local dive centre found an enormous school of barracuda circling at the end of a point that juts out invitingly into the Lombok Straits. That evening, the dive centre owner posted pictures on his Facebook page and held court in a local bar, soliciting divers to join him the following morning to go back to the

same site.

He was successful, in one respect, as he managed to get quite a large group together for the dive trip. However, other people had been listening to him the previous night. The next day, as the divers, crammed into minibuses, were on their way to the beach to board the boats, they passed a fleet of pickup trucks going in the other direction, laden to the brim with dead barracuda.

### Creatures great and small

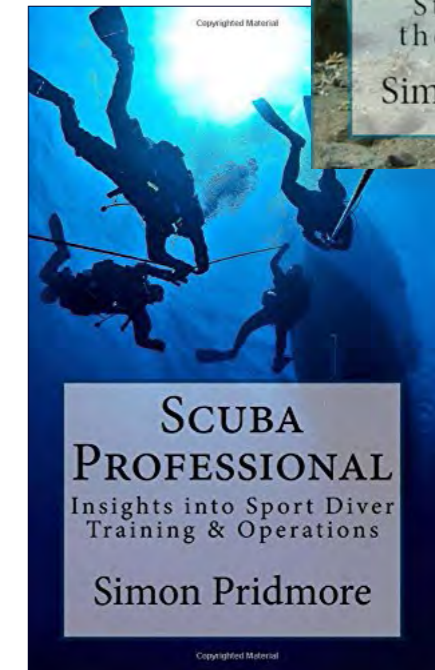
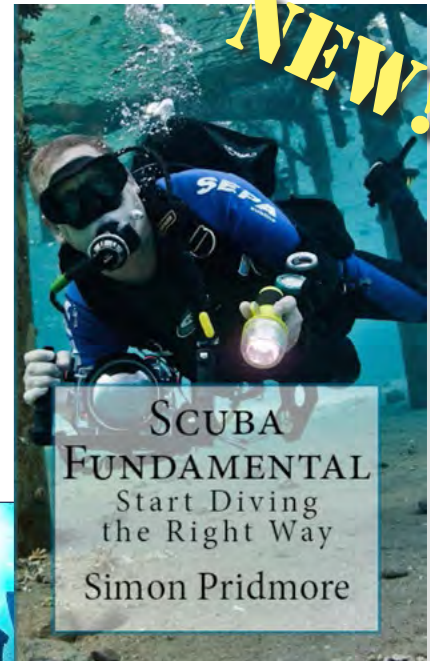
It is not only large animals that are affected. Along Bali's northern shore, far away from

the tourist hot spots, there are a few sheltered bays where tiny, rare creatures hide. One of these is called Puri Jati. The villagers here are very poor. They do not share in the tourism wealth of the island's south.

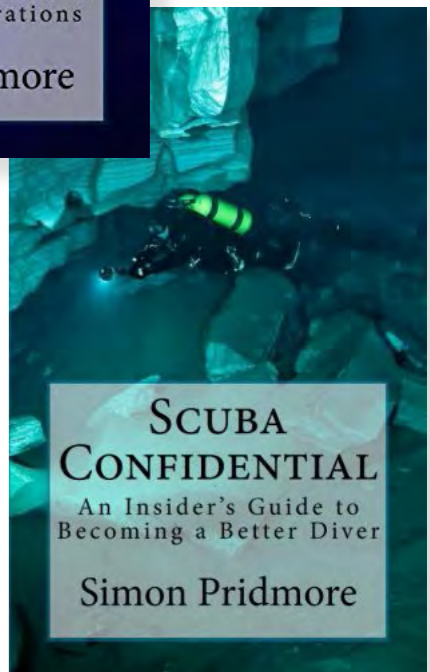
Encouraged and assisted by a philanthropic Bali dive centre, a local family set up a small shaded facility on the beach with freshwater showers, toilets, concrete rinse tanks for gear and cameras, and a snack shop. Dive instructors and guides who bring divers here pay a fee for using the facility. The whole setup is a great example of ecotourism at its best: local people and

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opinion



professional divers working together for mutual gain and in the interests of both tourists and the marine environment.

Sadly, from time to time, other people along this stretch of coast, who do not share in the fees paid by the scuba divers, sneak in at night and drag weighted nets along the seabed. Perhaps, they have heard reports of divers coming out of the water with smiles on their faces, and assume the bay is full of fish. It is not. All they dredge up are small octopi and tiny creatures like frogfish, pipefish and rare, exotic types of scorpion fish: hidden treasures for divers but no use at all for feeding hungry families. The day after the nets have passed, the sand that was previously literally crawling with life is a desert.

### Unintended consequences

In all three of these cases, far from protecting the marine life, the scuba diving activity had the exact opposite effect and resulted in its destruction. The primary causes were lack of information, education and commu-

nication. The dive operations did not have the local coastal communities on board or on their side. They had failed to recruit community leaders to their cause, leaders who could explain how dive tourism could benefit everyone in the area. Of course, this was a role that local members of staff at a senior level could perform: if they had some.

The dive operations had not garnered sufficient local support or sufficiently involved the community financially, intellectually or emotionally in what they were doing. Therefore, self-interested members of the community had no qualms about sabotaging their efforts. They might not even realise that what they were doing is sabotage. They might simply be acting opportunistically.

An oft-quoted statistic is that a shark is worth US\$100 (for meat and fins) dead but US\$1,000,000 (in tour-

ism dollars) alive. For a fisherman, this is not a convincing argument for not killing a shark, if the US\$100 will feed his family for months and if he receives not one cent of the value of the shark if he allows it to live.

### Education and communication

As a dive professional or marine eco-entrepreneur, campaigning on behalf of fish and reefs in blogs and on websites directed at divers may bring you customers but you are preaching to the converted. There are other groups of people living closer to the problem who can do much more with the message you are delivering. By involving coastal communities and local authorities, you can change behaviours that are harmful to the future of scuba diving tourism.

Resort and dive centre owners must spread the word into the wider world beyond the dive community by

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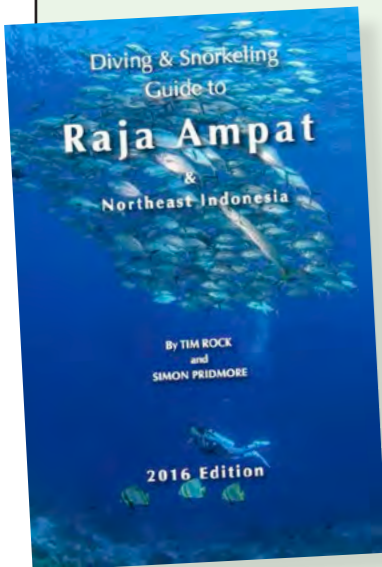


# opinion

involving more local people in their dive operation: training managers, taking on more local guides, converting local divemasters into dive instructors, even taking local people underwater on try-dives. They need to get the local authorities interested—to make the effort to know the leaders and opinion-formers and talk to them. All this will build support links to coastal communities and engender mutual trust. Their interests and the resorts' interests can coincide. They just have to be shown how.

### More than a beach clean-up

To end with a shining example of what can be achieved: In northeastern Bali, a recent beach clean-up programme was introduced under the Trash Hero banner. The usual suspects showed up: dive instructors and their students, local divers, hotel staff and other environmentally concerned residents. But the folks



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running the programme wanted to broaden their reach and encouraged local schoolchildren to participate, initially with the promise of ice-cream afterwards. In casual conversation during the clean-up sessions, the children learnt to differentiate bad trash (plastics, cans, bottles, etc.) from good trash, such as leaves, logs and weeds. They also came to understand why there was a difference and what made some trash “good” and other trash “bad.”

After a while, the children became the most enthusiastic cleaner-uppers of all and there was no longer any need to bribe them with ice-cream to per-

suade them to show up. Now, under pressure from students, a local school has started its own trash clean-up along neighbouring streets. Small steps: sometimes, that's all it takes. □

*Simon Pridmore is the author of the international bestsellers, Scuba Confidential—An Insider's Guide to Becoming a Better Diver, Scuba Professional—Insights into Sport Diver Training & Operations and Scuba Fundamental—Start Diving the Right Way. He is also the co-author of Diving and Snorkeling guides to Bali and Raja Ampat and Northeast Indonesia. This article is adapted from a chapter in Scuba Professional.*

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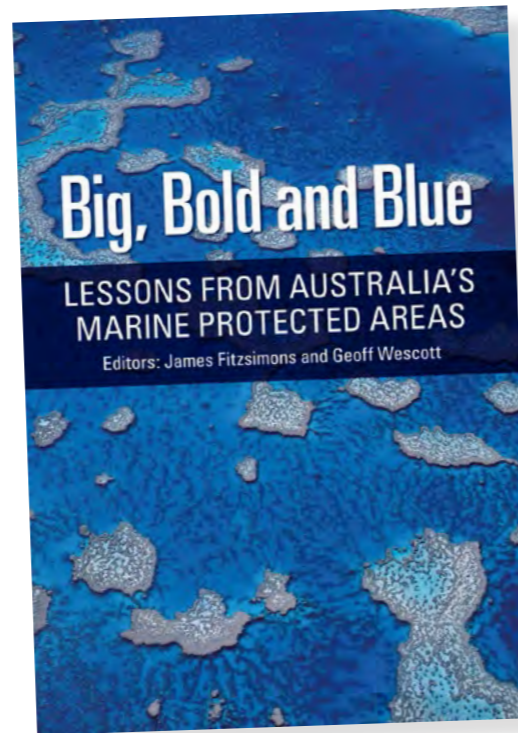
## Oregon

*Diving off the Oregon Coast*, by Tom Hemphill and Floyd Holcom.

If you live in Oregon, chances are you are familiar with the dive sites along its coast. With giant kelp forests, brilliantly colored anemone, sponges to small reef fish, large ling cod, rock scallops, abalone, giant Pacific octopus and friendly wolf eels

beneath its waves, there is no need to travel far to satisfy your passion for diving. This book contains chapters on the unique features of the area's underwater environment, dive pioneers, development of dive education, equipment for cold-water diving, dive clubs, dive stores and, of course, the popular dive sites along the Oregon coast.

Series: Images of Modern America  
Paperback: 96 pages  
Publisher: Arcadia Publishing  
Date: 10 October 2016  
ISBN-10: 1467124087  
ISBN-13: 978-1467124089

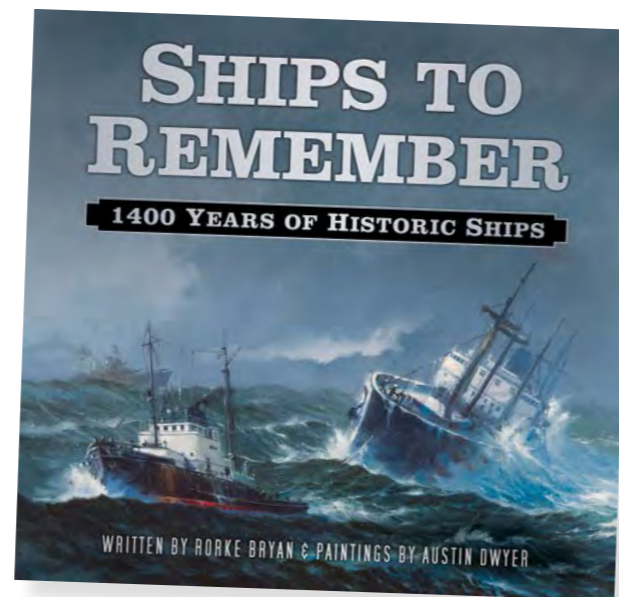


## Australia

*Big, Bold and Blue: Lessons from Australia's Marine Protected Areas*, edited by James Fitzsimons and Geoff Westcott.

With one of the world's largest systems of marine protected areas, Australia has amassed much experience in this area. In this book, lessons learned over the years are shared, in a bid to assist other communities in their own marine conservation efforts. The book contains real-world examples, academic research, perspectives on government policies, and information from indigenous sea country management, non-governmental organisations, and the commercial and recreational fishing sectors.

Paperback: 432 pages  
Publisher: CSIRO Publishing  
Date: 31 October 2016  
ISBN-10: 1486301940  
ISBN-13: 978-1486301942



## Shipwrecks

*Ships to Remember: 1400 Years of Historic Ships*, by Rorke Bryan and Austin Dwyer.

Read about 25 ships that have sailed, bearing witness to momentous events in the past. Some ships (or the individuals on board) figure prominently in the history books, like Darwin's HMS *Beagle*, Ernest Shackleton's *Nimrod* and the *Cutty Sark*. Others may not be as famous, but their careers and histories are no less remarkable. Every chapter starts

with a convenient sidebar with the vessel's statistics and contains photographs where available.

Hardcover: 192 pages  
Publisher: The History Press  
Date: 1 August 2016  
ISBN-10: 0750965908  
ISBN-13: 978-0750965903



## Sea Life

*Sea Creatures in Glass: The Blaschka Marine Animals at Harvard*, by Scala Arts publishers and Florian Huber.

Delicate works of glass creations so lifelike one could almost imagine them coming to life. This book features photographs of 60 of the most exquisite models by 19th century artists Leopold and Rudolf Blaschka, from the collection at the Harvard University's Museum of Comparative Zoology.

The photographs depict in stunning detail the artists' superb mastery of their craft, in a brilliant fusion of art, science, Mother Nature and human innovation.

Paperback: 112 pages  
Publisher: Scala Arts Publishers Inc.  
Date: 25 August 2016  
ISBN-10: 1785510436  
ISBN-13: 978-1785510434



## Philippines

*Philippines Reef Creatures Guide*, by Franko Maps.

This sturdy and colorful plastic ID card can be handy when you first start to dive and are unfamiliar with the reef's marine life. On it are realistic illustrations of 50 species of reef creatures like the butterflyfish, parrotfish, triggerfish and barracuda. Measuring four by six inches, it is waterproof and has a hole to which you can attach a lanyard. Ideal for beginner divers, snorkelers and nature lovers.

Map: 2 pages  
Publisher: Franko Maps Ltd.  
Date: 22 August 2016  
ISBN-10: 1601904991  
ISBN-13: 978-1601904997



# marine mammals



## New rules are proposed by NOAA for swimming with spinner dolphins in Hawaii

Aimed to give more space to Hawaiian spinner dolphins, NOAA Fisheries wants to put a 50-yard distance between humans and dolphins. This buffer zone also applies to drones and any other approach by air or water.

As an important area for spinner dolphins, Kealakekua Bay is where many people head to have encounters with the animals. The new proposed rules enhance established protections and are meant to prevent harassment and disturbance to the cetaceans in their natural habitat.

Violating the new rules could end up costing you up to US\$100,000 in fines and a year in jail.

But there would be certain exceptions, NOAA spokesperson Jayne LeFors told KITV. "If the dolphins come to you, and you make no further effort to engage them or pursue them then that's not a violation," she said. ■

## Are dolphins having conversations?

**For the first time, researchers have recorded a couple of dolphins having a conversation. They used an underwater microphone, which they developed, that could discern the animals' individual "voices".**

It has been known for decades that dolphins and whales have an advanced mode of communication—distinctive whistles and clicks that express excitement, happiness, anxiety or separation from a group.

But now researchers have shown how dolphins form "words" by altering volume and frequency of pulsing clicks. These are then strung together into "sentences" similar to that of human speech, and they politely listen to each other, not interrupting the speaker before replying.

This communication was recorded by Ukrainian scientists working with two Black Sea bottlenose dolphins, named Yana and Yasha, at the Karadag Nature Reserve in Feodosia.

Lead researcher of the study published in the journal

Mathematics and Physics, Dr Vyacheslav Ryabov, said: "Essentially, this exchange resembles a conversation between two people.

"This language exhibits all the design features present in the human spoken language. This indicates a high level of intelligence and consciousness in dolphins, and their language can be ostensibly considered a highly developed spoken language, akin to the human language."

### Dolphin speak

In fact, for more than 25 million years, dolphins have been

swimming around with larger and more complex brains than people. While the scientists found that the dolphin pair could create sentences of up to five "words", we still do not understand what they are saying.

Ryabov said, "Humans must take the first step to establish relationships with the first intelligent inhabitants of the planet Earth by creating devices capable of overcoming the barriers that stand in the way of using languages and in the way of communications between dolphins and people." ■

SOURCE: TELEGRAPH

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Several remoras catch a ride on a lemon shark in the Bahamas

Text by Ila France Porcher  
Photos by Larry Cohen, Peter Symes

**While studying reef sharks in Tahiti, I became fascinated by the behavior of the remoras accompanying them. They were fish of the family Echeneidae, and ranged in size from a few centimeters long, to about 50cm. They were pretty silver fish with widened heads, and often a black racing stripe. With their transparent fins and tails, and their exaggerated horizontal undulations while swimming, they had a showy look, and their behavior was unexpectedly complex.**

Remoras have evolved a clever strategy to survive. Their relationship with sharks is mutualistic—of benefit to both species. While using the shark for transportation, and feeding from the scattering particles generated when it eats, remoras keep it clean of parasites and dead skin, thus contributing to its health and well-being.

The upper surface of a remora's head has slot-like structures, which create a

vacuum between it and the shark's skin, allowing the fish to stick itself to a shark at will. This it will do, generally, after it has finished eating, or for convenience in staying with a shark on the move.

Occasionally, especially when the sharks were excitedly socializing, I would see one shoot upwards in an effort to

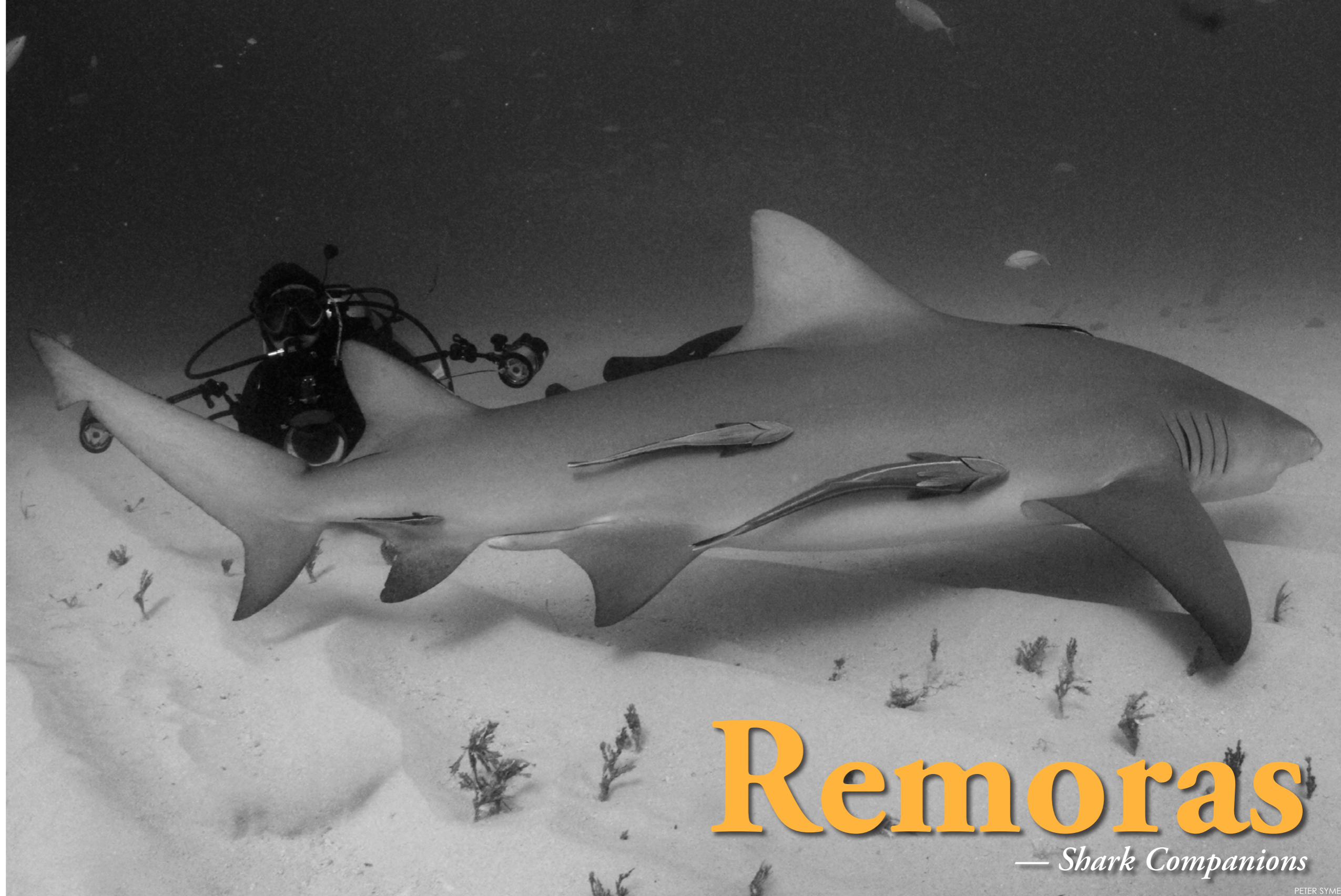
bite a remora, providing a possible reason why those fish, in spite of their intimacy with sharks, tend to stay close to them, and behind their heads.

### Switching rides

The sharks would come early to the site at which the shark sessions were held,

so when I arrived there, many would be waiting. Their remoras came independently to greet my kayak, and during the session they roamed around, sometimes with another remora, and sometimes alone. They seemed to know each other, and until the sharks left, they ate and pursued a social life of their own.

After eating, they would stick fast to a shark and ride away. With their bloated stomachs, they looked the image of indolence, like a person flopped on his back on a couch after a big meal. The graceful fish could stick on well—even the sharks' energetic shaking did not bother them.



# Remoras

— *Shark Companions*

PETER SYMES



# shark tales



Remoras are silver fish, with widened heads, often sporting a black racing stripe along the body. They have transparent fins and tails, exaggerated horizontal undulations while swimming, and their behavior is unexpectedly complex.

They seemed to be capable animals—able to function independently of sharks when necessary. They were likely able to find a shark whenever they wanted to, if for some reason, they lost their usual host.

At one of the sessions, a large shark who rarely visited glided in. As she swept through the site, a remora with a full stomach who had been sticking to one of the large nurse sharks, switched to her as she passed, and left with her some-time later. A lull ensued, after which

more sharks began to drift in from down-current. One was another elderly female visitor, and the stuffed remora, who had left 15 minutes ago, was reclining on her head, looking just as stupefied as before!

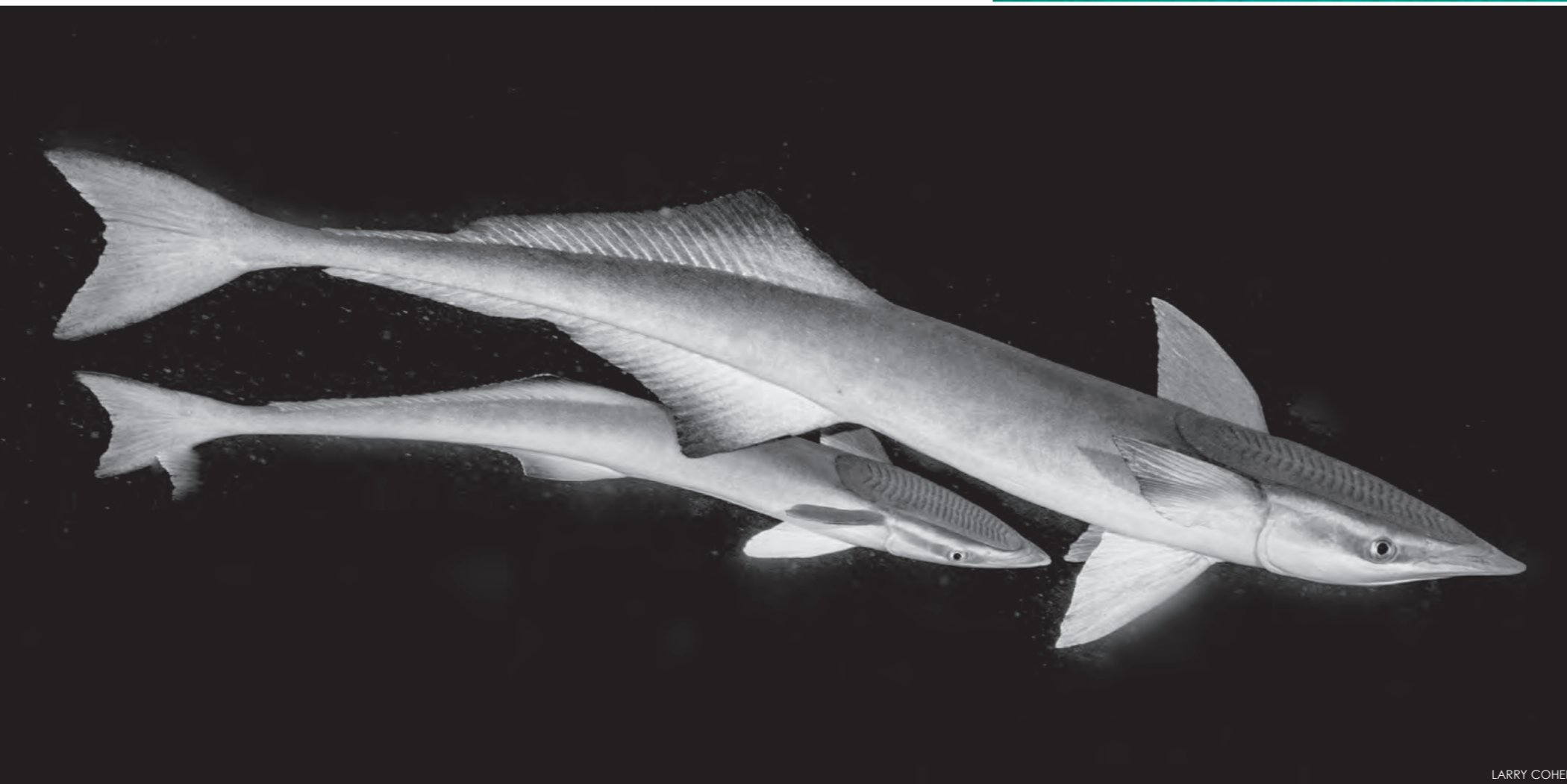
Evidently in the interim, the two shark visitors had passed close enough to each other for the remora to have changed sharks, like a person changing planes.

### Displaying preferences

This and other similar observations



PETER SYMES



LARRY COHEN

Close-up of a pair of remoras. The slit-like structures on the upper surface of the remora's head allow it to create a vacuum between itself and a shark's skin.

suggested that remoras distinguish between individual sharks and have preferences. Perhaps a remora who usually remained with the same shark would learn its habits, and adjust its life-style accordingly, rather than being subject to continual surprises and unwelcome displacements with strange sharks. Certain remoras remembered me over long spans of time, and they appeared to know individual sharks, too. In spite of their lethargic appearance, they were alert and making decisions flexibly according to the situation.

Early in my study, a remora arrived with a group of sharks that had just come to the lagoon from the ocean. He was attached to the chin of a female shark who kept trying to dislodge him, and when she succeeded, he flew first after one shark then another, yet did not join any of them. When they left, he came flitting back to where some fish scraps lay, and there he waited, moving around in apparent agitation. Every so often he swam a few meters in one direction, returned, and



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# shark tales



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Close-up of remora (above); Remoras hitch a ride on lemon shark in the Bahamas (right)



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after a while, took a similar foray the opposite way. Time passed while we waited for the sharks to return. When at last a shark appeared, scarcely within visual range, the remora saw it and went winging after it, his fins a blur. But he did not catch up to the shark, and soon returned to roam around in my vicinity, sometimes going away in one direction or another to look more widely. Eventually, he came tentatively over to me, and flowed up my leg and around my body, trying to stay out of sight as I bent to stroke him. I fed him some crumbs from a scrap, and he eagerly ate until he was full. Then he settled on my leg and eventually attached himself while I roamed around looking into the coral crevices. After half an hour, when no sharks had returned, I tore up a fish head in hopes of attracting some back for him, and left.

It was not the only time that a remora appeared to become distressed due to losing his shark. In general, each fish seemed to remain aware of the movements of the shark with whom he had come, in order to be ready to leave with it. Each remora was different. Some seemed to consider me a welcome companion right away, while others would not come near.

### Polite companions

One evening after a shark session, I was feeding the fish when an exceptionally large, white remora arrived with a group of visiting blacktips. I was shredding meat from a fish head, and he put his head deep down inside, and grabbed bites beside my fingers. I was concerned about accidental

bites, but he behaved as if he was used to eating with a person with skin the color of the meat, and never made a mistake. Soon he was stuffed. Once he was attracted away by one of the young sharks, who was circling nearby close to the surface, but he quickly left her, returned to me, and rejoined the same visiting shark with whom he had arrived, the next time she passed. He reappeared about a month later when it was nearly too dark to see, and remembered me. He flitted back and forth in front of my mask, then around my neck and torso. I had nothing at hand, however, and ignored him at first, but after a few minutes,

when he went to try to get a few crumbs from a nurse shark, I searched out a fish head that still had meat in it. I went down to the nurse shark to get the remora's attention, and when he saw me, he rose with me to the surface, and ate with his head beside my fingers as before. When the fish head was empty, I put the anchor in the boat and, holding it, began to drift away, but the remora was still curvetting around my body, so I got back into the boat to avoid displacing him. Nevertheless, he remained with the kayak, his long graceful tail waving slowly out from beneath it each time he turned. So eventually I paddled back to the site of the sessions, where



# shark tales



PETER SYMES

Remoras attached to a large tiger shark (above) and a lemon shark (below) in the Bahamas

sharks were still passing in the black waters, and he left the boat.

One morning after an observation session, I had just returned to my kayak, when a remora came swimming quickly along in mid-water as if it were going somewhere. It briefly considered me and swam on. Wondering where its shark was, I followed it at first, then turned back, and it followed. Back at the kayak, the shark soon appeared, and the remora fluttered over her body. The shark was covered with mating wounds, so I swam with her as she glided languidly away through the coral, the remora settling between her ventral fins.

Every few minutes it swam halfway to me, then returned to her. From time to time, it fluttered off to investigate something in the area, but soon rejoined the meandering shark, wriggling over her back before taking up its preferred position between her pectoral fins. When we returned, it flew ahead to the kayak, and was flittering

around its hull when we came in view. It was busy and alert, and reminded me of a dog out for a walk with its owners. Its behavior was typical of the remoras that accompanied me with a shark.

Over the years of the study, it was evident that individual remoras knew me from the sessions, and would leave their sharks to stick to me for long periods if they met me elsewhere in the lagoon, in spite of intermittent reappearances by the sharks. They had evidently learned that I was a good source of food, in spite of not being a shark. Likely they would also accompany other species, too, if an appropriate opportunity arose. ■

*Illa France Porcher, author of The Shark Sessions, is an ethologist who focused*

*on the study of reef sharks after she moved to Tahiti in 1995. Her observations, which are the first of their kind, have yielded valuable details about their lives, including their reproductive*

*cycle, social biology, population structure, daily behavior patterns, roaming tendencies and cognitive abilities. Her next book, On the Ethology of Reef Sharks, will soon be released.*



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## Eating shark products may increase risk of Alzheimer's

High concentrations of toxins linked to neurodegenerative diseases have been detected in the fins and muscles of 10 species of sharks.

In 2012, scientists at the University of Miami (UM) analyzed cartilage samples collected from seven species of sharks off the coast of the US state of Florida. All specimens contained high levels of a compound linked to the development of neurodegenerative diseases.

The findings were important because of the growing popularity of supplements that contain cartilage from shark fins among consumers who view them as cancer fighters or as a remedy for joint and bone problems, despite a number of studies that have discredited

shark cartilage as a cancer fighter.

### Muscles too

In a new study, scientists found high concentrations of toxins linked to neurodegenerative diseases, both in the fins and muscles of 10 species of sharks.

Concentrations of mercury and beta-methylamino-L-alanine (BMAA) were detected in the fins and muscles of all shark species, at levels that may pose a threat to human health. While both mercury and BMAA by themselves pose a health risk, together they may also have synergistic toxic impacts.

### Just don't eat shark!

"People should be aware and consider restricting consumption of shark parts. Limiting the consumption of shark parts will have positive health benefits for consumers and positive conservation outcomes for sharks, many of which are threatened with extinction due in part to the growing high demand for shark fin soup and, to a lesser extent, for shark meat and cartilage products," said Neil Hammerschlag, lead author of the study and assistant professor at UM. ■

## Greenland sharks may live beyond 400 years

Determining the age of the elusive Greenland shark is particularly difficult. The extremely slow growth rates of these sharks—less than a centimeter per year—suggested they must live for many years. In an attempt to estimate the age, a group of

scientists from the University of Copenhagen turned to radiocarbon dating, using as a time stamp the pulse of carbon-14 produced by nuclear tests in the 1950s.

"The carbon-14 method varies somewhat in precision in differ-

ent periods, but taking these uncertainties into account, we can say with 95 percent certainty that the oldest shark we've measured is between 272 and 512 years old," said lead author Julius Nielsen. ■ SOURCE: SCIENCE



## Why are shark teeth different?

There are more than 400 species of sharks in the world and each has a unique tooth shape. Some are simple triangles, while others are deeply notched or spear-shaped. But despite this variety, scientists haven't detected a difference in how different shark teeth cut and poke tissue.

A recent University of Washington study sought to understand why shark teeth are shaped differently and what biological advantages various shapes have by testing their performance under realistic conditions.

Sharks shake their heads rapidly when they bite their prey, so eval-

uating how teeth perform while in a side-to-side motion was critical to the study tests, which took place during a summer marine biology course at the UW's Friday Harbor Laboratories on San Juan Island.

### Trade-off

The researchers found there is a tradeoff between sharpness and longevity of the tooth edge. Two kinds of teeth, belonging to tiger and silky sharks, dulled after only several passes of the saw blade over tissue, meaning that it's possible these sharks in the wild must replace their teeth every time they kill prey. Meanwhile, teeth from the bluntnose sixgill shark didn't cut

as well, but they also didn't dull as quickly as the other teeth.

This might shed light on the feeding patterns of different sharks, the authors explain. For example, bluntnose sixgill sharks with duller, longer-lasting teeth might be swallowing their prey whole. Tiger sharks that eat a larger range of prey such as sea turtles, dugongs and seabirds usually bite their prey to pieces before eating it and would need sharper teeth to puncture a sea turtle's rigid shell, for example. When tissue is punctured and twisted side-to-side as prey is during a shark attack, the prey's tissue doesn't always behave the same way.



# tech talk

Expedition team member Cas Dobbin in main shaft of Bell Island Mine in Conception Bay South, Newfoundland, Canada

Text by Sabine Kerkau  
Photos by Jill Heinerth, Sabine Kerkau and Sandy Spurrell

**Last summer, my path led me for the first time to Newfoundland, Canada, more precisely to the town of Conception Bay South. Cave explorer Jill Heinerth invited me along with Rick Stanley, the owner of Ocean Quest Adventure Resort, to dive some wrecks in the bay. On this occasion, Stanley told us about a project whose realization he has been working toward for several years.**

In Conception Bay South is Bell Island, which is the location of an iron ore mine, disused since 1966. Many years ago, part of this mine was developed into a mining museum. Regular tours take place in the dry part of the mine. The aim of our expedition was to create an underwater museum in the flooded area of the mine. The mine comprises more than 16 square kilometers, riddled with passages, like Swiss cheese. Most of the mine is flooded. With several hundred kilometers of tunnels that exist in the area, it is a historical

treasure that is absolutely accessible and should capture the interest of visitors.

### History of the project

In 2007, a first attempt to realize the plan took place. Unfortunately, there was an accident, and the project was halted.

But Stanley never lost sight of realizing the idea of the underwater museum. Earlier this year, the authorities finally gave the green light for the resumption of the project.

After Stanley got the permits, the preparatory work began. It is almost unim-

aginable what Stanley and his Ocean Quest Adventure Team, supported by volunteers from the region and former miners, managed to accomplish within a few weeks.

They cleared exposed ridges, built bridges and walkways, laid power lines

and installed lighting. They built a diving platform and shelves for diving equipment. They got two golf carts to transport the divers from the dive center to the entry point. The risk of injury was significantly reduced by all these preparations. This time, nothing could go wrong!



*Bell Island*

# Mine Quest 2

*Expedition 2016*

JILL HEINERTH





SANDY SPURRELL

## Expedition team

In the actual expedition, cave explorer Steve Lewis was appointed team leader of the dive team. Like Stanley, he was one of the team members in the 2007 expedition. This time, the dive team consisted of Steve Lewis, Jill Heinerth, Phil Short, Gemma Smith, Cas Dobbin, John Olivero and myself.

Divers Alert Network (DAN) supported our project. They were represented by researchers Dr Neal Pollock and Stefanie Martina. The dive team members were monitored throughout the project by the researchers, undergoing various daily tests. These included blood samples, heart scans, lung function checks, as well as analyses of saliva and urine samples. Pollock and Martina gained valuable information about decompression stress at this time.

The expedition team was also accompanied by a film crew, directed by Robert Osbourne, who reported on the project for the *Daily Planet*.

During the expedition, the

team was supported by a group of around 20 volunteers led by Stanley and Jack Wood. They ensured our safety, helped us with the equipment, catering and facilitated our job wherever possible. It was a great honor for me to participate in the second Mine Quest expedition. It was a chance to do something very special, as

it was declared the Expedition of the Year by the Explorers Club in New York and the Royal Canadian Geographical Society.

## The expedition

The beginning of the first week of the second Mine Quest expedition project had been set for 15 February 2016. All preliminary



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Expedition team members Jill Heinerth and Cas Dobbin prepare for a dive in the mine; The film crew (top) documenting the events of the expedition

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CLOCKWISE FROM LEFT: Expedition team members Phil Short and Gemma Smith on the way to the dive platform in the mine—the newly built bridge makes it easier to see and get into the water; Researcher Stephanie Martina performs a heart scan on one of the expedition team members; Expedition team members check and prepare their equipment before a dive in the mine; Expedition leader, Steve Lewis, undergoes a lung function check after a dive in the mine



JILL HEINERTH

preparations had been successfully completed and project helpers eagerly awaited the arrival of the expedition team, the medical team and the film crew, flying in from all over the world on February 13 and 14. But the Canadian winter can be unpredictable. A heavy snowstorm delayed the arrival of the participants, and put the flexibility of the organizers to the test. The last team members finally reached Newfoundland late in the evening of February 14.

During the first team meeting, there were health screenings and the film crew took their first shots, which left us little time to get some sleep before the first day of the expedition. But who needs sleep on the eve of such an incredible adventure?

On the morning of February 15, we loaded the pick-up trucks with tons of equipment and made our way to Bell Island. There is only one way to get to the island: a small car ferry, which runs regularly.

Arriving at the mine, we first had to clear the entrances of snow.



JILL HEINERTH

Thereafter, the equipment was dumped in a dry cavern of the mine where it could be left to stay until the end of the expedition. Directly above this former locker room there is a small mining museum, which is closed during the winter months. During the expedition it was used by the DAN team and the film crew as a base. Even the diving team used it to warm up in after the dives



SANDY SPURRELL

and received medical attention in the cafeteria.

**The first dive**

The first dive team included Short

and Smith, who were to place the main guide line in the underwater area of the mine. They were followed by Heinerth and Dobbin, who were responsible for photographing the

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THIS PAGE: Scenes from the engine room of the mine

mine and collecting samples. The last team consisted of Lewis, John Olivero and me. Olivero and I would look for artifacts and document the mine. Lewis would position markers on the main line during the survey of the mine.

All teams performed their tasks successfully. Unfortunately the visibility was not good during our dive. Nevertheless, we were all very impressed with the first insights from the dive. We found large tunnels, lots of branches, pipes, pumps, signs and pictures on the walls, lamps and more tools.

After the dive, we were taken on the golf cart back to the locker room. After surfacing, we had 20 minutes to get back to Pollock and Martina. Over the next two hours, a cardiac scan was performed on each diver every 20 minutes. In addition, blood tests were taken and various spirometric (lung) tests performed.

The other two teams had already gone back to the mainland. My team, the DAN team and Stanley could only head back later because of the tests. Meanwhile, the weather had deteriorated and the ferry ceased operating. We had to stay on Bell Island. It is in such a situation that the quality of one's team is revealed.

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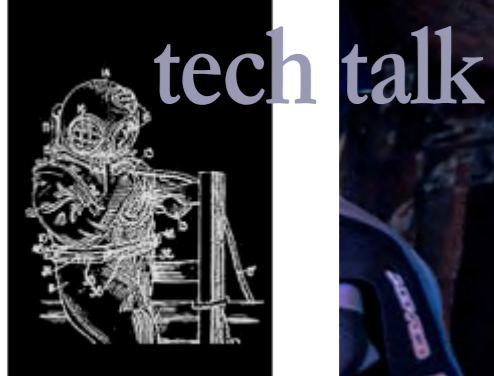
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# tech talk

Expedition leader Steve Lewis (right) in the new entrance to the mine after flooding from heavy rains; Artifact found in the mine: a Pepsi Cola bottle from 1960 (lower right); Snow had to be removed after a storm blocked the new entrance (below)



SANDY SPURRELL



SABINE KERKAU



SABINE KERKAU

## Weather worries

A snow storm decended on us and it was bitterly cold. In winter, almost all business on Bell Island is closed, including all accommodations. We could not stay in the car and the museum was closed. We thought in the short term, we could ask for shelter for the night in the local jail or at the hospital. Fortunately, Stanley was able to get the owner of a

pecially for us.

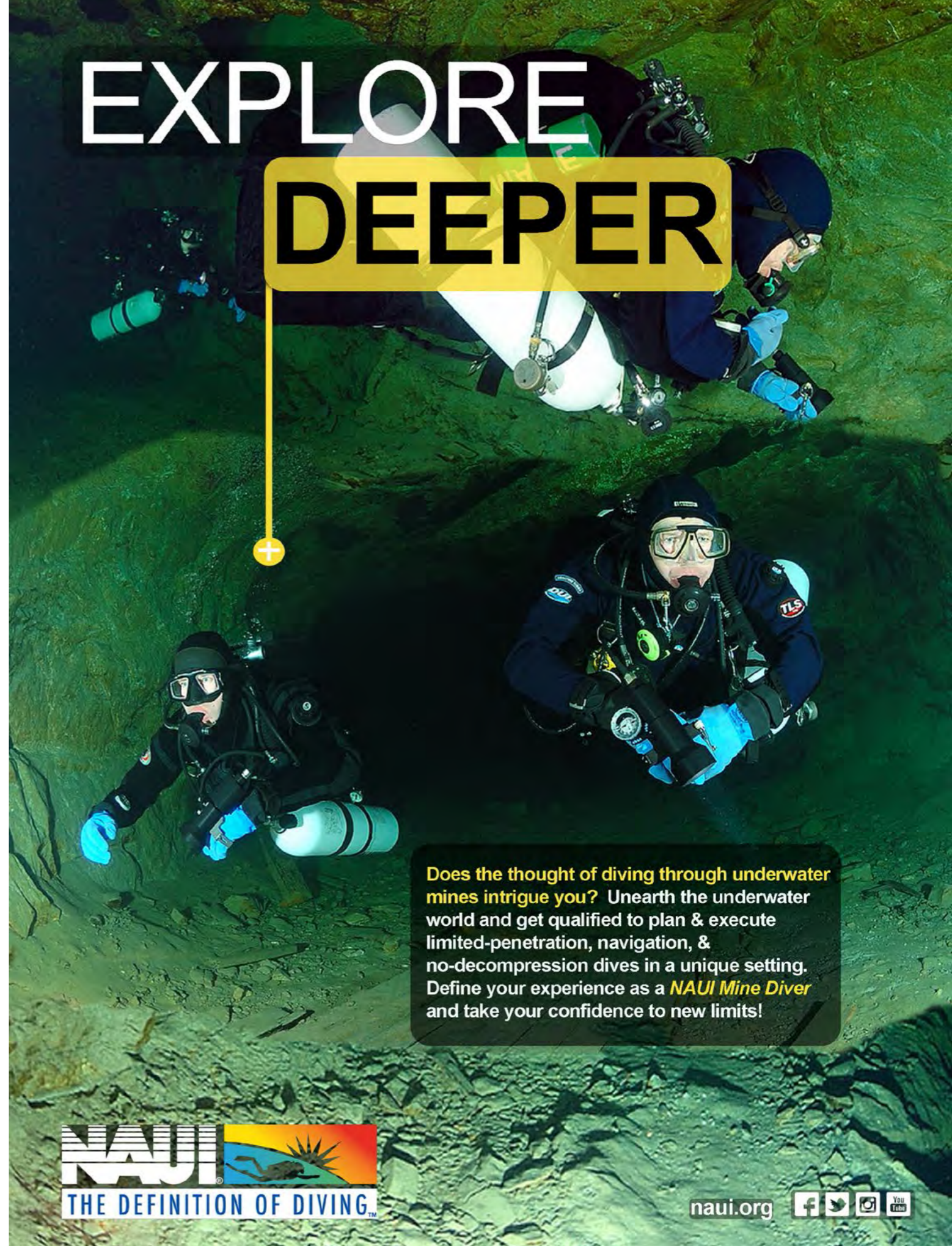
On the second day everything ran without problems. Our dive teams were the same as the day before. Everyone knew what he or she had to do. Olivero and I found wonderful artifacts, including a Pepsi Cola bottle from 1960.

Around noon, we got the news that the weather had gotten bad again and the ferry would cease

operation again. This time we made the last ferry.

Over the next few days, Stanley rented a hotel on Bell Island for the whole team. We were able to schedule two dives per day without the pressure of making the last ferry out each day. Only the gas supply was a bit tight. Stanley and his wife, Debbie, brought us refilled bottles on their boat, because bad weather conditions would not allow transport by ferry. We made good progress. Everyone was very pleased with the results. The dives were great. Stanley was quite right about the project.

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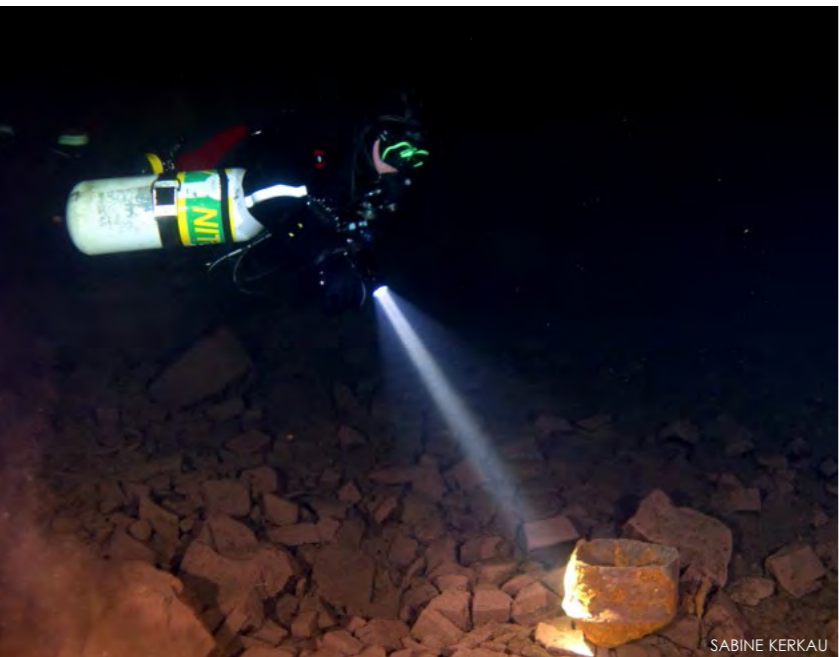


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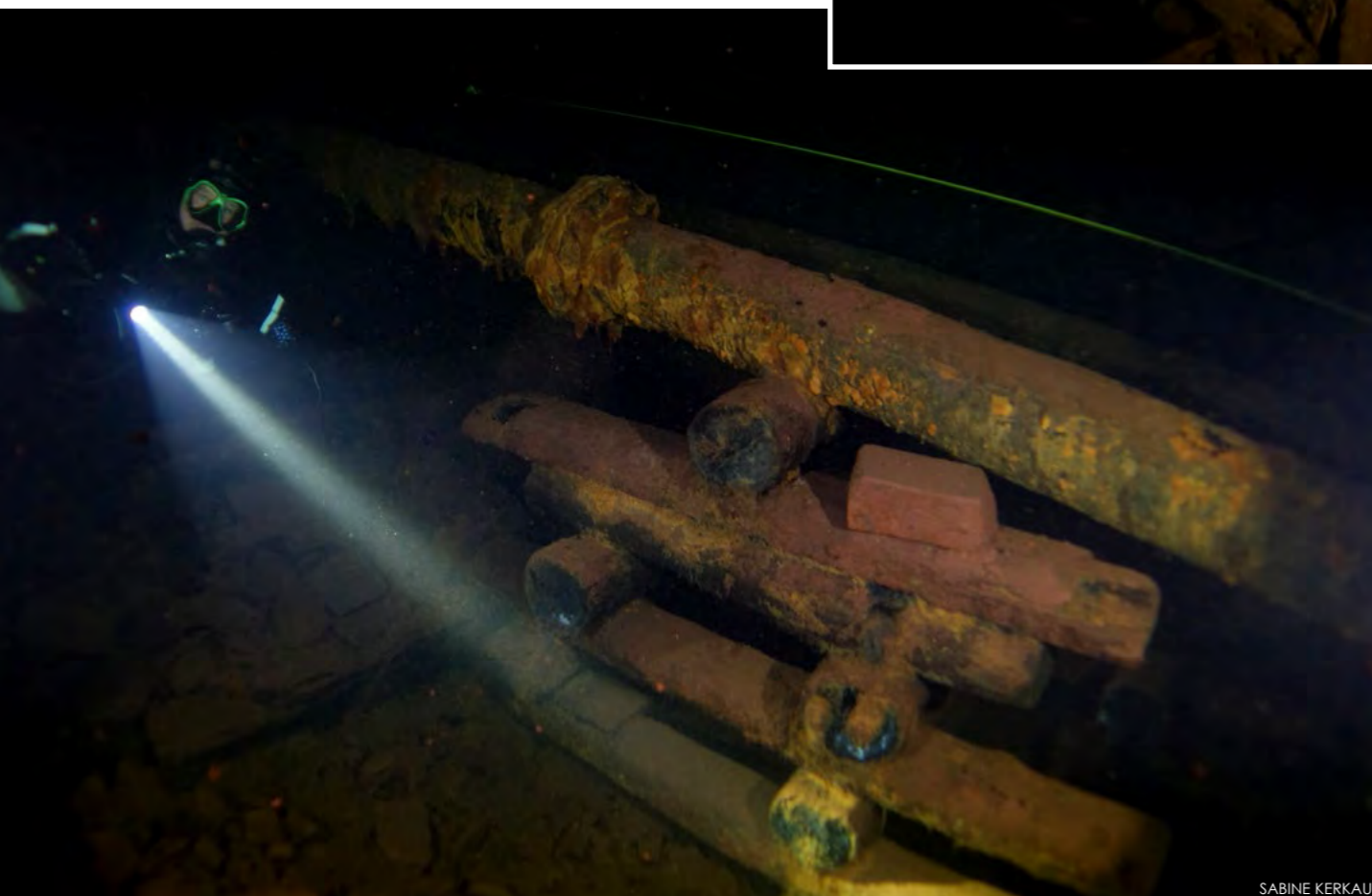
THIS PAGE: Vessels, tools, lighting fixtures, pipes, graffiti and more... each new meter brought more discoveries



SABINE KERKAU



SABINE KERKAU



SABINE KERKAU

## Flooding

I suspect that if there had not been any problems or challenges, then it might have been almost boring to dive the mine. Then, there was a sudden thaw in the weather conditions, and it began to rain heavily, causing the snow to melt overnight.

When we arrived at the mine in the morning, a wet surprise awaited us. The water level had risen by almost one and a half meters. Part of our equipment was on the verge of being flooded. The new entry was no longer usable.

So, the entire expedition team had to improvise yet again. The support team immediately set to work recovering our equipment. Within two hours, a new dry area was cleared and all the equipment, including storage facilities, were transported there. And so, the expedition continued, without much delay.

With all the water that had flowed

into the mine, the diving conditions had deteriorated massively. Visibility at 20m depth was very bad and the temperature in the shallows was only 2-3°C. Despite all these challenges, we had a very successful expedition, with continual safety.

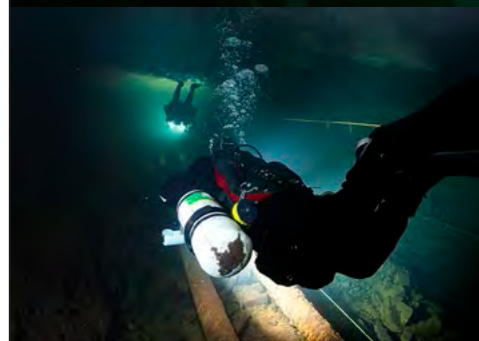
As a result, we laid 400m of yellow line, documenting many artifacts along the way. Even the film crew and the DAN team were very pleased with their yield. For me, it was a fantastic experience to work with such a professional team. ■

For more information, please visit: [Bellislandmines.com](http://Bellislandmines.com).

Sabine Kerkau is a German technical diver, dive writer and underwater photographer based in Switzerland. For more information, please visit: [Sabine-Kerkau.com](http://Sabine-Kerkau.com).



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Text and photos  
by Mike Bartick

Observing animal behavior is a highpoint of any dive, whether it is watching fish spawn, nudibranchs feeding, or my current personal favorite—egg brooding. Getting great images of this type of behavior, however, is quite different than observing and will promise to challenge an underwater photographer on every level. The first step to success on capturing this style of image is becoming a bit more savvy on the intended target, by doing a little research and knowing what to look for and where to find it.

For instance, a common pipefish might carry its developing brood on its belly, in a specially designed flap, while a female ornate ghost pipefish will carry them in a pouch. What I like the most about



# Shooting the Brood

That's a mouthful!

Photographing mouth brooders such as this male yellow-barred jawfish (*Opistognathus* sp.) found in Anilao, Philippines, is certainly a lesson in fertility and patience. Jawfish are

a sand-dwelling subject that construct burrowed chambers and use shells and stones to fortify their access point. They are opportunity feeders that rarely leave home to find food and would rather wait, perched at the opening of their borrow for a passing snack. This is

also where you will find them brooding their eggs as the passing current not only delivers food but helps to aerate their eggs, often times facing directly into the current line. This behavior is something to keep in mind when positioning yourself this close to the sand and

upcurrent. Kicking up any sediment not only hampers your shot but can also damage other jawfish and burrows in their community—don't struggle, and use extreme caution with your fin kicks.





Getting close enough to see through the anemonefish eggs can be a dangerous proposition as these guys are pound for pound as dangerous as a pygmy tiger shark. For me these tiny eggs appear to look like little Minions. Approaching the eggs from the side and using a super macro set up will yield a unique look inside. Try some backlighting to help the sense of seeing through the translucent eggs.



Orange finned anemone fish (*Amphiprion chrysopterus*) tend to their eggs that are normally laid on a rock under or next to their host anemone. Each of the fish that shares this anemone guard and aerate the eggs as a family unit and even the youngest or smallest sibling can be seen fan-ning the eggs. Study their routine for a few moments prior to moving in on the anemone, you will discover that the dominant fish will swim a certain pattern, hesitating for a moment to fan the eggs. These make for great blog or social media post too.

shooting egg brooding images is that I always learn something new about the targeted subject.

Of course everyone will say, "Wow, what a lucky shot!" when they see your images, but I have noticed that the more I am prepared for the shot, the "luckier" I become. So if you are looking to get lucky on your next trip, prepare for it in advance, as you never know when that chance-of-a-lifetime opportunity will strike.

The best gear for the job is a lens that allows for shooting at a distance, like a prime 100/105mm macro lens. This allows for your subject to relax and behave naturally and will allow you to shoot a more candid photo. Simultaneously while capturing this natural history style image, technical quality must also

be at its best. Setting the bar high is often the best course of action; close attention to strobe power, angle and proper settings will make or break a chance-of-a-lifetime image, so be ready.

#### Did you know?

Parenting for marine animals takes specialized skill and strategy that only Mother Nature, herself, could have designed. Unlike humans, the expecting parents of marine animals must deal with extenuating circumstances at all times. In a risky numbers game, the survival rate for individuals is extremely low and the constant threat of survival is always present for the parents and their babies.

Several factors come into play to



I prepared for shooting the eggs of a Banggai cardinalfish (*Pterapogon kauderni*) for months. I contacted the resort I intended to work with and had them relay my wishes to their guides prior to my arrival. Once I was there the guide and I began to discuss the images that I wanted to capture when he said he might have something even better! After two consecutive days of diving on one specific coral head we finally identified the target subject. Hours of research and preparing all came down to one brief instance when the cardinal fish quickly turned towards me. Later I was rewarded to see that the fry of the hatched eggs were actually in the Banggai cardinal fishes mouth and was definitely better than what I had planned. This was the first image I had ever seen of this type and I still cherish the experience of discovery. Often times contacting the resort ahead of time and relying on your guide can be a crucial part of preparation, teamwork is crucial.

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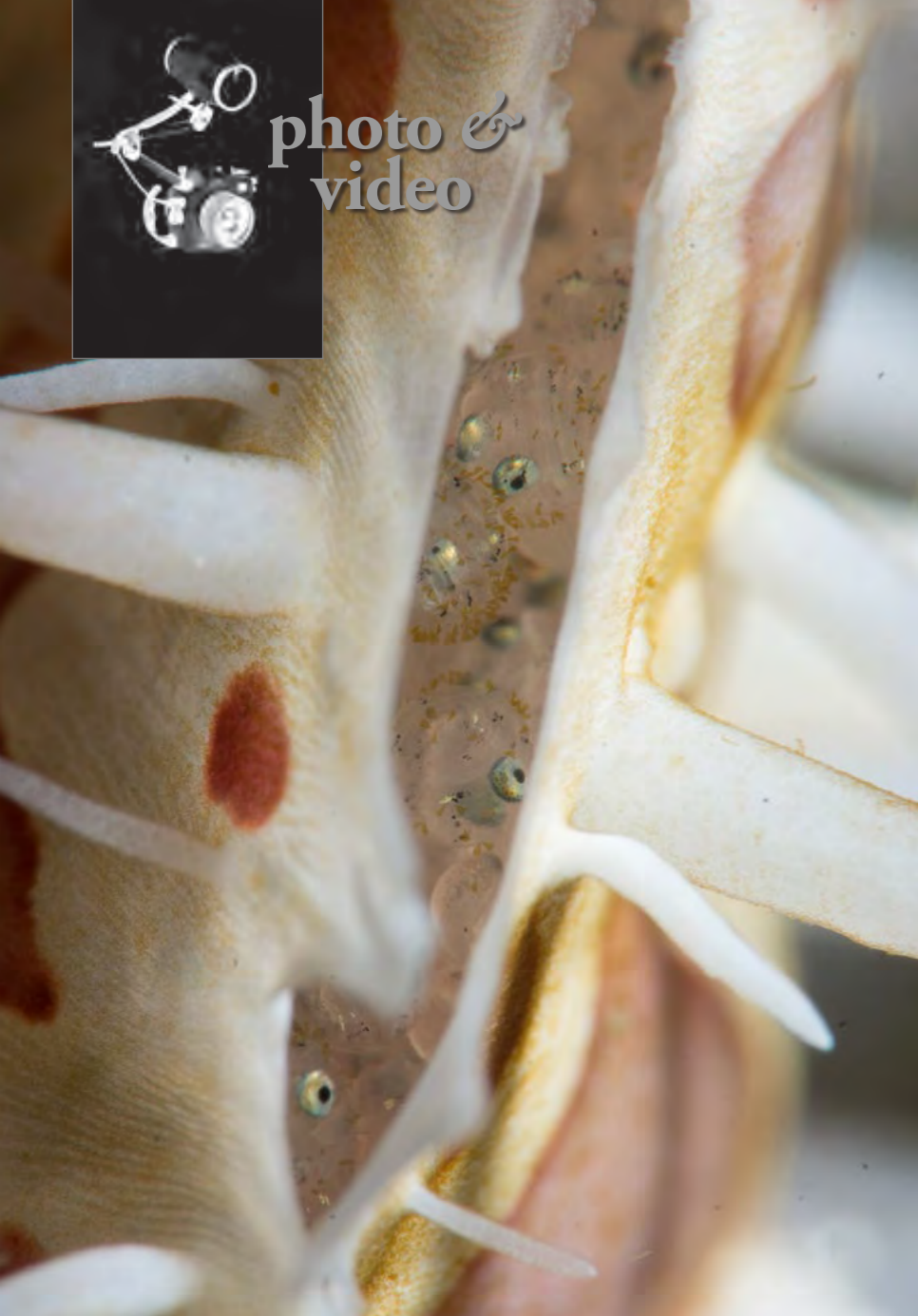
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Ornate ghost pipefish, or *Solenostomus paradoxus*, females carry the eggs in a specialized pouch under her abdomen. Becoming sexually mature towards the end of their annual lifecycle, the female will court several males at once to ensure successful propagation. The eyes can be seen on these eggs as they are ready to hatch and begin their life. Approach slowly and watch as the pouch opens slightly and closes, as she aerates her eggs. Timing is critical, and using your diopter will again yield a more dramatic image.

Don't shy away from shooting a nudibranch laying eggs as you never know when you will need them. The *Halgerda batangas* can be found on reefs on almost any dive site in the Indo-Pacific area and are quite common; however, a decent photo of them can be a challenge. The colorful egg ribbons can be just as gaudy as their parent, depending on the species and is an interesting topic unto itself. I used a combination of a longer lens with a snoot for better lighting on this subject.

I shot the same egg ribbon with my super-macro set-up of stacked diopters to get an idea of just how small the eggs really are. This example illustrates yet another way of creating something uncommon from a common find. Planning and preparing is a crucial component in expanding your portfolio and will increase the luck factor dramatically. Take your time, learn all you can and be ready for that chance of a lifetime shot. Remember to be kind to the underwater environment and take care when shooting the images. As tough as these subjects might be in their world, they remain very delicate.



Broods

ensure the success of the brood. The most obvious first, the host parents must seek nourishment during the incubation period or risk peril from weakness and starvation. Leaving the defenseless eggs alone is never an option, as they provide a tasty source of quick protein for other animals, and therefore, must be protected at all times. Additionally, during the incubation period, the eggs must be continuously aerated to ensure the proper flow of fresh water and oxygen, or


the eggs will die.

The answer to getting the shots you want will be as different as the animals themselves, so stay alert and keep your head in the game. ■

*Mike Bartick is a widely published underwater photographer and dive writer based in Anilao, Philippines. A small animal expert, he leads groups of photographers into Asia to seek out that special critter. For more information, visit: [Saltwaterphoto.com](http://Saltwaterphoto.com).*




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Peacock sea mantis (below), or *Odontodactylus scyllarus*. This complex species of Stomatopoda (400 described) are often confused with shrimp as their common name implies. The brooding duties of the sea mantis are often taken care of by the female; however, the male is also known to carry the eggs. In some cases, the female will actually prepare two rounds of eggs and both parents will carry their eggs. The peacock mantis eggs are a dull grey or red when fresh but become bright red when mature and are “clutched” to their chest. The mantis is a long-living creature that can live up to 20 years and will mate and brood up to 25 times throughout their lifecycle. Try shooting the image in a portrait fashion to accommodate the shape of the subject.



It is the male banded pipefish that carries the eggs in this species of pipefish. The developed eggs are bright red and will develop oversized eyes just prior to the release. Waiting and watching the banded pipefish movements will allow you to plan the timing and to position yourself strategically to capture the best possible image.

These super cute lemon gobies (above) have become very popular in the online social macro forums and make for a challenging and lengthy dive. Search coconut shells, dead bivalves or even discarded bottles and be sure to inspect them carefully. The eggs are most likely present, and with a little planned luck and a diopter, you could come away with something special. I like to focus on the intended area for the shot and employ my focus lock technique to keep the lens from hunting at the wrong moment. Hold the position and try to refrain from chasing your subject by letting it come to you.

A squat lobster (top left) is caught releasing its eggs, and as luck would have it, I captured the image. The truth is, my guide called me over, and as I approached to see what the excitement was all about, I nearly swam away. Thinking for a moment, why would this yummy fish snack be sitting on top of the substrate like this, suddenly the subject leaned back putting its claws up and I realized what was happening. I locked focus and fired “at will” hoping for the best. I don’t often use the “spray and pray” technique, but this is exactly how it happened. It was over in a three-frame burst, and there was no way to re-create this lucky opportunity.

QUICK TIPS FOR SHOOTING BEHAVIOR

- Use a longer lens.
- Use appropriate strobe power and angle.
- Use a high shutter speed—200 for SLR or 500 for compact.
- Use mid-ranged f-stops (f/14) for best depth of field at 18-24 inches and sharpness.
- Familiarize yourself with your intended subject or behavior.
- Test shoot a photo at the anticipated distance and coloration of your subject, set your exposure accordingly.
- Re-adjust your strobes if your able to get closer than intended.
- Keep a super-macro diopter handy for close-up detailed images when possible.
- Use your focus lock to restrict your lens from hunting at the wrong moment.





photo & video



Using a focus light with an Auto Off feature will prevent hot spots (above); Using a focus light will also be helpful when shooting macro subjects under ledges (right); Fantasea Line Nano focus light has the Auto Off feature (left) as does the Bigblue focus light (lower left)



Fantasea Line Nano focus light

Bigblue focus light

## Using a focus light in underwater photography

Text and underwater photos by Larry Cohen

The focus systems in modern digital cameras have improved greatly in the past few years. In order to work properly, a certain amount of light and contrast on the subject is needed. For these reason, it is a good idea to add a focus light to an underwater kit.

When shooting macro under ledges, a focus light is helpful. It can also double as a dive light during night dives and when diving in an overhead environment.

The most efficient placement is to mount the focus light above the lens port. The beam angle

should be narrow, and unlike lights used for imaging, the focus light does not have to be very bright. Three hundred lumens are bright enough to be used as a focus and dive light, as long as you are close to the subject.

It is important to aim the light to an area with contrast. Many camera systems will not focus on a flat area without detail, even with a focus light. One could use a flat white area such as the bottom of a shark or manta ray, for example. The addition of a red beam or filter will prevent the light from alarming marine life during a night dive.

When creating images in an

overhead environment, at times it is beneficial to use a slow shutter speed. This could cause the focus light beam to appear in the image. To prevent this, many companies, including Fantasea Line and Bigblue, produce focus lights with an Auto Off feature. These lights have a light-sensitive sensor. When the strobes fire, the focus light turns off for a moment. This will prevent the focus light beam from appearing in the image.

Adding a compact focus light with the Auto Off feature will help your camera focus and will not have an ill effect on the image.



Using a focus light without an Auto Off feature can cause a hot spot

# Carolyn Steele



## P O R T F O L I O

# portfolio

PREVIOUS PAGE: *Seaweed Blennies*, by Carolyn Steele. Acrylic on paper, 15 x 22in. Close-up view of two comical Caribbean seaweed blennies popping out of their sea sponge hidey-holes.

Text edited by Gunild Symes  
All art work and photos  
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**Originally from England, tropical wildlife artist Carolyn Steele creates brilliant, captivating and vibrant paintings of reef life, inspired by her treks to islands in the Caribbean. Now based in the US state of Florida, the artist shares her love of the underwater world and her perspectives on ocean and reef conservation.**

*X-RAY MAG:* Tell us about yourself, your background and how you became an artist.

CS: I grew up in England. As a young girl I attended private art classes where I created detailed wildlife studies in various media. My father, an incredibly talented artist, inspired and encouraged me from the time I first began drawing as a toddler.

After earning my degree in English Literature from the University of Kent at Canterbury in the UK, I embarked on a career in graphic design, just before home computers came on the scene. I made the transition from ruling pens and T-squares to computer screens, but found the computer limiting and impersonal; I preferred paintbrush and paper to mouse and mouse pad. Around the time I was feeling a bit frustrated with graphic design, I visited St. John in the US Virgin Islands (USVI) where I snorkeled among coral reefs and turquoise waters teem-



*Boxfish Berthold*, by Carolyn Steele. Acrylic on paper, 22 x 30in. Close-up of a bashful-looking, fantastically colored spotted boxfish hovering over a large green sea anemone.



*Pablo*, by Carolyn Steele. Acrylic on paper, 18 x 24in. An exotic and somewhat haughty Picasso triggerfish observes the observer. Most of Steele's close-up fish portraits contain hidden hearts.

ing with life. Everything changed after that first trip to the tropics. I came back inspired, dreaming in Technicolor, and began to capture some of my exotic Caribbean experiences on paper.

After a few years of painting Caribbean scenes and returning to Saint John with small reproductions and notecards of my work, an artist's representative who lived in St. Thomas, USVI, contacted me and asked if he could represent me in the Virgin Islands. This was the springboard I needed to cut back on my graphic design business and focus on creating a diverse body of artwork.

*X-RAY MAG:* Why marine life and underwater themes? How did you come to these themes and how did you develop your style of painting?

CS: I am a snorkaholic. The very first time I put on a mask and experienced the magical underwater world of the reefs, I was hooked, forever. It was the experience of snorkeling that opened my eyes to the amazing diversity of life on our beautiful planet. I'm constantly inspired by the color, design and beauty of the wildlife I have observed over years of travel in the tropics. I was so inspired by

my first visit to St. John that I began painting as a way to stay connected to the experience and extend the afterglow of what I felt had been a life-altering experience.

*X-RAY MAG:* What is your artistic method or creative process?

CS: I am constantly inspired by what I experience firsthand and see in various media. My husband, also an artist, has photographed extensively on our snorkeling trips. I use his photographs, and those in books and online, both as ref-



# portfolio

*Handle With Care*, by Carolyn Steele. Acrylic on paper, 30 x 22in. This surreal concept piece, featuring a healthy Caribbean reef, symbolizes how Steele feels about coral reefs and our planet: "Their future is in our hands."



*Coral Canyon*, by Carolyn Steele. Acrylic on paper, 22 x 30in. Large rocks and corals create a deep canyon passageway for sea creatures.

periences and creative springboards. In graphic design, I had been constrained in my use of color, especially if a client's print job was just a one-color or two-color project. I found painting to be incredibly liberating. I like to work fairly big, rarely smaller than 18" x 24" (46 x 61cm); I do most of my paintings on 22" x 30" (56 x 76cm) heavy 300 lb. cold-press watercolor paper.

I generally go into a 'zone' where I

open my mind to ideas. I love to use humor in my work. Often a title will pop into my head, from which a scene will emerge. Once an idea takes hold and the main elements are in mind, I compose a tight sketch, which I then enlarge and transfer to watercolor paper. The next step is to apply gesso, then masking fluid, to protect parts of the drawing before applying background washes—which is when the fun begins.

My paintings take between 20 and 80 hours to complete, which means I live in each scene for quite a while. My technique is tight and my compositions are carefully thought out, but not everything is predictable. I have lots of fun with blends, staining and salting. Acrylic paints suit my style because they enable me to layer colors and build highlights.

*X-RAY MAG: What is your relationship to*

## Steele

*the underwater world and coral reefs? As a snorkeler, how have your experiences underwater influenced your art? In your relationship with reefs and the sea, where have you had your favorite experiences?*

CS: We have snorkeled extensively in the US and British Virgin Islands, Carriacou, the Tobago Cays, Bonaire and the Florida Keys. My favorite experiences have been in St. John, USVI, where approximately 60 percent of the island is designated a US National Park. I have so many "favorite experiences" that it's hard to narrow

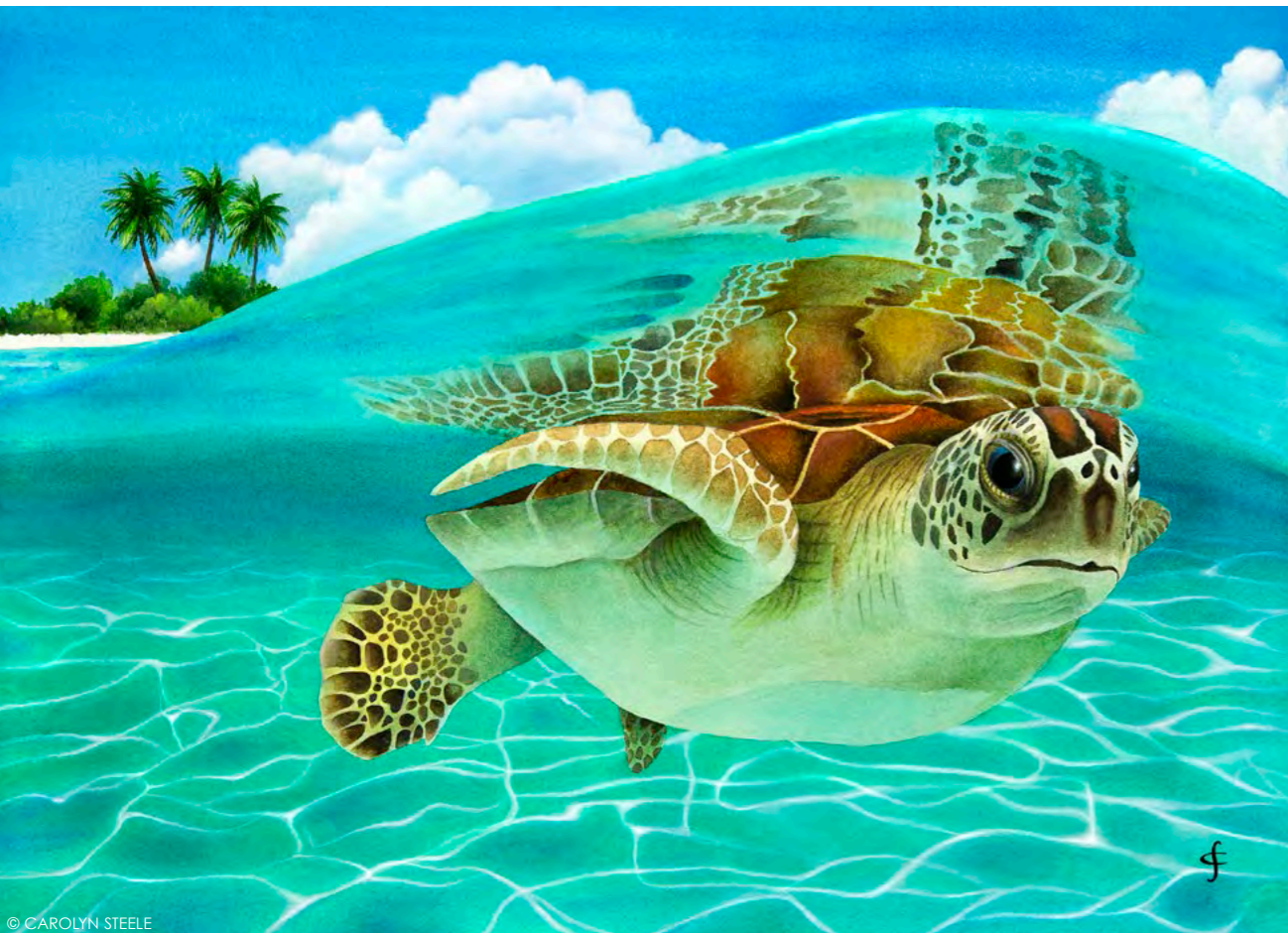


*Kiss My Face*, by Carolyn Steele. Acrylic on paper, 18 x 24in. This close-up of a fabulously colored Mandarin goby was Steele's first painting to depart from the Caribbean species.



# portfolio

*Trigger Happy* (right), by Carolyn Steele. Acrylic on paper, 22 x 30in. This deep-water scene features the beautiful colors and patterns of a Caribbean Queen triggerfish, with others close behind and in the distance. *Midday at the Oasis* (below), by Carolyn Steele. Acrylic on paper, 15 x 22in. A baby green sea turtle is mirrored in the water's surface as she swims away from the island beach where she was born.



© CAROLYN STEELE



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Steele

*Radical Wrasse*, by Carolyn Steele. Acrylic on paper, 18 x 24in. Close-up view of a leopard wrasse amid nubbly and branching corals.



© CAROLYN STEELE

them down.

My most spiritual moments have been while swimming among large sea turtles. To watch them quietly and gain their trust enough view them close up is pure magic. Most of my paintings contain one or more of these beautiful creatures.

I also enjoy what I call "micro-snorkeling." Shallow fringing reefs right off the beach are best for this. Watching cleaner shrimp grooming fish, feather duster worms responding to the current, tiny blennies peeking out of their hidey-holes—it's all enchanting. Sea life in this shallow, light-filled environment is about as colorful and exotic as anything on the planet.

Some friends once took us in their sail-

boat to a secret mangrove cove. It's hard to describe how vivid and mysterious it was, but my husband posted a video on YouTube, called "St. John: A Snorkeler's Paradise," which conveys the essence of that adventure.

Mangroves are nurseries for sea life. It was fascinating to see the huge variety of juvenile fish swimming through shafts of sunlight among the mangrove roots, many of which were beautifully encrusted with colorful coral and sponges, or see them lurking in eerie shadows to avoid detection. A snorkeling expedition to a mangrove should be on every diver's bucket list.

X-RAY MAG: *What are your thoughts on*

*ocean conservation and coral reef management and how does your artwork relate to these issues?*

CS: I'm committed to nature education and conservation, which is why I donate a portion of my profits to wildlife and reef conservation groups. I hope my artwork will help people appreciate the variety and fragility of the reef biosystem. Many species represented in my paintings, such as sea turtles, are threatened or endangered.

I have seen an alarming degradation of the reefs we have visited over the past 25 years—due to careless tourists and boaters, pollution from property development runoff, storm damage, cruise ships,





*Send In The Clowns*, by Carolyn Steele. Acrylic on paper, 22 x 30in. "This one is pure fantasy," said Steele. "I chose amusing parrotfish species from oceans worldwide to populate the scene."

showing your work to various audiences?

CS: I have had great feedback on my work from people all over the world. Many are divers who say the images remind them of special times spent on the reef. Others say that my images simply make them feel happy.

It is always exciting to see children react to my artwork. Thanks to my licensing company (MGL Licensing in London), my images can be seen worldwide on posters, puzzles, tile murals, fabrics and other media. A few months ago at an art festival, a little girl stopped in front of one of my prints and said, "I have a puzzle of that one!"

I find that kids are initially drawn to my work because of the colors, and then get hooked on the subject matter. They will often ask me questions about the species I paint. I like to think these are future snorkelers and divers... and conservationists.

X-RAY MAG: What are your upcoming projects, art courses or events?

CS: I always have a few paintings waiting in the pipeline. I'm just finishing up a big piece and have two smaller ones sketched out already. My husband and I recently moved to southwest Florida, and will be participating in art festivals down here during the upcoming high season (October through April).

X-RAY MAG: Any last thoughts to leave with our readers about your art?

CS: I see my paintings as love letters to the tropics. I hope they inspire people to go out and experience, and cherish, these amazing sights in real life. ■

For more information, please visit the artist's websites at: [CarolynSteele.com](http://CarolynSteele.com) or [Etsy.com/shop/WaterlemonMoon](http://Etsy.com/shop/WaterlemonMoon)

and ocean temperature and acidity changes. We must work to reverse this trend. I hate to think that future generations might only be able to appreciate the ocean's diversity of life through the paintings, photographs and videos people are making today.

X-RAY MAG: What is the message or experience you want viewers of your artwork to have or understand?

CS: My painting, "Handle With Care," probably says it best. It's up to us human beings, as the most successful life form on Earth, to cherish and protect our planet. Don't take things for granted. Be curious but careful. Have respect for other life

forms, some of which have been around for millennia and are suddenly endangered because of our recklessness, selfishness, and short sightedness. As the old saying goes, leave behind only footprints.

X-RAY MAG: What are the challenges and/or benefits of being an artist in the world today?

CS: In many ways, we artists have a great deal more control over our product today in that we can reproduce our artwork affordably. A few years ago, I invested in a large format Epson printer. This enables me to produce my cards and prints on demand, using archival inks on high quality paper or canvas in

a variety of sizes to suit any buyer's budget—instead of having to make a huge up-front investment to print limited runs of artwork, as with the lithography printing process.

We artists also have greater quality control now because of digital cameras and the ability to color correct or manipulate our own images once they have been digitized. It means I can finish a painting one day and feature it on my website ([CarolynSteele.com](http://CarolynSteele.com)) or my Etsy shop ([Etsy.com/shop/WaterlemonMoon](http://Etsy.com/shop/WaterlemonMoon)) the next.

X-RAY MAG: How do people respond to your works? What feedback or insights have you gained from the process of



*Puff Daddy*, by Carolyn Steele. Acrylic on paper, 18 x 24in. Close-up of a comically solemn puffer fish swimming in front of coral and a sea anemone.