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The Red Sea resort of Sharm el Sheikh, situated at the southern point of the Sinai, has some of the world's most celebrated diving attractions around its shores. The world-famous Ras Mohammed National Park is located at the very tip of the Sinai Peninsula where deep water upwellings generate incredible coral growth, particularly on the signature sites of Shark and Yolanda Reefs.

During the summer months this area is also a hotspot for schooling snapper, barracuda, batfish and unicorn fish. Marine encounters recorded by divers on these life-filled sites also include whale sharks, manta rays and dolphins.

Head north from Ras Mohammed to the Strait of Tiran and you will find a coral garden described by scuba diving pioneer Jacques Cousteau as one of the most spectacular reefs he had ever seen. The steep-sided walls of Jackson Reef are where you will find some of the most beautiful coral cover in the Sinai region, including the famous rare red anemone. Strong currents, most profuse at the edge of Jackson Reef, attract an abundance of pelagic fish particularly during the summer months. In the less wind-swept and calm days of summer, boats are able to dive the north side of the reef. Although far from guaranteed, the chance to see the resident school of scalloped hammerhead sharks is well worth a dive in the blue water.

Wrecks are also a major pull for visitors, with one of the most famous sunken diving attractions located just a few hours' boat ride from Sharm. Voted time over as one of the best wreck dives, the *Thistlegorm* alone attracts scuba visitors from all over the world to the northern Egyptian Red Sea resort.

If you don't want to travel far to a dive site, or like the idea of half-day trips, you can opt to go local. Sharm's local reefs are excellent for training and photography, and at the right time of year throw up their own spectacular surprises. From the months of May to September it is not unusual to spot the odd manta ray or whale shark passing by as they follow the plankton.

Egypt
where it all begins

Power of the imagination

FIRST IN

STEVE WEINMAN, EDITOR

IN AN ATTEMPT TO FIND a news story that wasn't about deadly viruses, I spotted a headline telling me of a bid by Canadian divers to transform their favourite shipwreck into an artificial reef.

I was intrigued mainly because, as far as I know, a shipwreck is already an artificial reef. I know people sometimes think of ships that sank accidentally as wrecks, and those sunk deliberately as artificial reefs, just like those underwater statues and arty coral-cultivation frames. But if you pursue that line of thinking, where does that leave insurance jobs?

There are plenty of those, at least according to local gossip at many wreck-sites I've dived, and those vessels were sunk deliberately but not with the welfare of the coral and fishes in mind.

However they sank, however interesting or dull their history, the fact is that ships, boats and planes are all artificial reefs within hours of hitting the bottom. If you've dived a recently sunk vessel you'll know that as soon as the silt settles, inquisitive marine life starts turning up to see what's in it for them. Good for us.

When I read the news story it turned out that the idea was to add a new wreck near the old one, so that together they would turn Lunenburg, Nova Scotia into an international tourist magnet. And when I looked up the original wreck, the destroyer HMCS *Saguenay*, it seems that it was scuttled in 1994 as, guess what, an artificial reef for divers. Resting at 27-33m, it looks a good dive. Two artificial reefs, better still.

I'D HAPPILY DIVE any sort of "artificial reef" for a variety of reasons, but it got me thinking about the role of the imagination in diving. You could dive two similar wrecks, both well-colonised and bristling with interesting features, but it's the one that inspires thoughts of how the ship sank or its colourful history that elevates a dive into an unforgettable experience. The story of *U-133* this month is an example.

I've dived wrecks on which many people had died; on scuttled vessels with a history of drug-smuggling or gun-running; at archaeological sites. The ghosts of the past inform every such dive in some way.

The site of the moment has to be the Peristera shipwreck near the Aegean island of Alonissos. There's no way that vessel was sunk deliberately for the delight of divers because it went down 3600 years ago, and I doubt whether it would have been insured either.

It's 30m deep, a local guide is mandatory and your every move will be monitored by solar-powered cameras armed with image-recognition software, so it's not an entirely natural experience. But it marks a giant step for the Greek authorities, who have always assumed that divers mean no good and kept them at arm's length, so is to be welcomed.

You might have dived elderly wrecks with timbers long gone, leaving only scattered amphoras. But this Athenian barge, colossal among ancient wrecks, carried up to *4000* wine-jars and they're still there – stacks, heaps and towering piles of them. It's not just a load of old pots; it's a dive to get the imagination working overtime.

I say that in confidence having yet to visit this particular artificial reef, but looking forward to it. *Saguenay, U-133* or Peristera wreck, none of them belong on the seabed, but however they got there, let's make the most of them. And by the way, as I write Greece's gates are open…

DIVER

the magazine that's straight down the line…

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DIVER Britain's best-selling diving magazine

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Before and after – technical divers

SIX TECHNICAL DIVERS from the volunteer group Ghost Diving have succeeded in removing abandoned fishing-gear that had covered the WW2 submarine wreck HMS *Perseus*.

The wreck, a cultural heritage site, lies at a depth of 52m between the Greek islands of Kefalonia and Zakynthos, and the divers' prime objective was to protect marine life from getting tangled in the netting and line. Visitors to the site were said to include loggerhead turtles, dolphins and rare monk seals – which happened to put in an appearance while the team were at work.

Millions of animals are reckoned to die each year when they get trapped in lost fishing-gear, says Ghost Diving. Set up in 2009 and formerly the Ghost Fishing Foundation, the organisation was the first and says it remains the biggest such international dive team.

The divers, supported by members of Aquatic Scuba Diving Club of Kefalonia, carried out three 65-minute dives on HMS *Perseus* between 22 and 26 July.

First came a thorough survey dive, after which the team decided to focus on the conning-tower and the fore outer hull. They reported that the task was made more challenging by the many long-lines that had become entangled with the nets over the years.

On the second dive the team managed almost to clear the conning-tower of nets, revealing the original structure.

On the final dive they removed a large piece of netting that had covered the outer hull, extending to the seabed, and reported that everything had gone as planned.

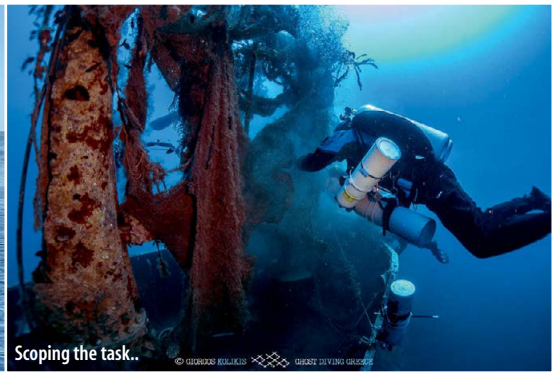
The team also cleared other wrecks in the same depth range during the five-day operation, recovering a total of half a tonne of ghost-gear.

HMS *Perseus*, one of the largest WW2 submarines, is well-known because of the story of sole survivor John Capes. He escaped through the hatch after the submarine had hit an Italian mine and ended up on the seabed. The hatch remains open.

Capes survived the journey to the surface, a five-mile swim to Kefalonia and 18 months as a fugitive. The story is told from a diver's perspective by Martin Strmiska on DIVERNET.

Conning tower before…

Back to the RIB.


Scoping the task..

The Dive Show reset for March at the National Exhibition Centre

The NEC Birmingham Dive Show, which had to be postponed from its usual October dates because of Covid-19 restrictions, has a new dateline. What is now DIVE 2021 has been set for the pre-Easter weekend of 27/28 March next year.

The Dive Show is organised by DIVER Group and, subject to coronavirus-forecasting caveats, its new dates avoid the UK winter months of December-February to place the show as far as possible from any seasonal increase in pandemic disruption.

Pre-Easter Dive Show events held by the DIVER Group in London in the past have proved an ideal lead-in to the UK diving season.

Coinciding with the switch to British Summer Time, weather conditions are unlikely to be poor enough to cause travel problems – nor good enough to see too many UK divers heading for the sea.

DIVER Group and the UK's top venue are now working together to make what was always going to be a special 30th anniversary event not only the safest possible but also the most attractive to attend – with special ticket promotions and a wide range of in-hall attractions.

NEC Birmingham has proved extremely supportive and flexible, says DIVER Group, adding that the UK events industry has come together in a spirit of collaboration during the current crisis and is now welcoming a return to business.

"Clearly there will be challenges ahead and we're certainly not out of the woods just yet, but the fact that we can all start to plan with a clear go-live date is great news," said NEC Group head Ian Taylor on announcing the reopening of the exhibition centre in October.

Nightingale hospital provisions were not expected to affect NEC events. "The Nightingale facility at the NEC went into hibernation in May without having received a single patient and I'm pleased to say the decommissioning of this facility is now well under way," said Taylor in July.

"We expect to continue our support of the NHS with the creation of a small non-Covid standby facility, but it won't affect our re-opening for event business."

With safety a priority, the centre has developed a scheme called NEC Venue Protect that outlines everything it will be doing in partnership with event organisers to help keep visitors and exhibitors as safe as possible.

An overview of the measures as well as updates on DIVE 2021 can be found at diveshows.co.uk

untangle HMS Perseus sub wreck


… and after.

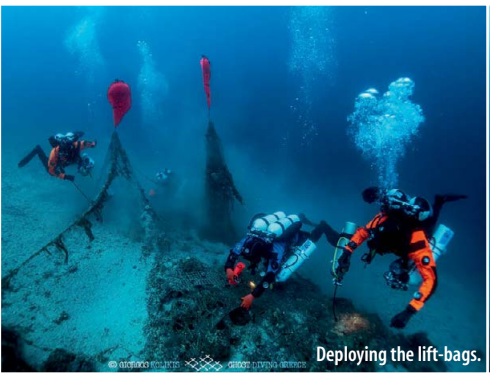

The scale of the wreck.

The underwater clearance was organised by Healthy Seas, which arranges the recycling of recovered nylon net into Econyl yarn, used to make swimwear, sportswear, socks and carpets.

Since it was founded in 2013, Healthy Seas says it has collected some 460 tonnes of fishing nets with the help of volunteer divers and fishermen. But it also says that every year another 580,000 tonnes of fishing-gear is abandoned at sea.

Alongside the underwater operation, Healthy Seas organised a public event on Kefalonia to raise awareness of marine pollution and ghost-nets.


The hatch through which John Stoker escaped.


Deploying the lift-bags.


The netting is lifted away from the outer hull.


The gun.

UNDERWATER PHOTOGRAPHY COR KUYVENHOVEN & GIORGOS KOLIKIS / GHOST DIVING

Unlicensed divers warned against disturbing seahorses


Spiny seahorse.

THE SEAHORSE TRUST

JULY'S DIVER *NEWS* carried a report that divers from marine-conservation charity the Seahorse Trust had been delighted to find that spiny seahorses that had gone missing from Studland Bay in Dorset for two years had returned in numbers.

But now that scuba-divers too have returned to the sea, the trust is concerned that their activities could jeopardise the seahorses' resurgence.

According to a report in the *Sunday Telegraph* in mid-July, the threat arose because divers who would normally be travelling overseas to see exotic marine-life species had turned instead to accessible UK shore sites.

Last year Studland Bay was designated a Marine Conservation Zone (MCZ) in recognition of the importance of its seagrass habitat and seahorse population.

Spiny and short-snouted seahorses are protected under the Wildlife & Countryside Act, making it illegal to actively seek them without a Marine Management Organisation licence, or to disturb them. It seemed to be quiet lockdown conditions that had enticed the seahorses to stage a comeback.

Executive director of the Seahorse Trust Neil Garrick-Maidment said that his organisation had recorded 46 seahorses in previous weeks, including 21 on one dive, the highest tally since monitoring began in 2008.

But he warned that other divers had been at the sites every day, and that use of strobes, approaching too close and boat-noise could stress the fish and potentially kill them.

"Covid-19 has been terrible but it has done some amazing stuff for the natural world – it's quite terrifying to think that all the good it did might be undone in just a couple of weekends," he commented.

Studland also has anchorages for many private boats, however, so divers will hope that the report's reference to the intense effect on the seahorses of the sound of "350-plus" vessels did not leave the impression that this came from a fleet of dive-boats.

Malta dive-pro cleared of manslaughter charges

THE FORMER OWNER of a dive-centre in Malta was cleared in July after being charged with the involuntary manslaughter of a British female diver five years ago.

The decision followed what the magistrate hearing the case described as a series of failings on the part of the prosecution, led by Police Inspector Bernard Charles Spiteri.

Petrina Matthews from Halesowen died near the well-known Blue Hole site on the island of Gozo on 10 March, 2015.

The 61-year-old had been diving with a school then owned by Jacqui Hedley, 39, from Mellieha.

Joseph Mifsud, presiding at the magistrate's court, heard that the school had hired out the dive-gear Matthews was using, according to a *Times of Malta* report on the proceedings.

The prosecution had contended that the regulator provided had been defective, leading to her death.

Two instructors who had been accompanying Matthews' group told the court that no difficulties were apparent during the dive or on ascent.

Matthews had surfaced with her instructor and started swimming towards rocks before suddenly appearing to become unwell and lose consciousness.

The other divers brought her ashore. Officers of the Civil Protection Department and paramedics attended but, after being given CPR for 40 minutes, Matthews was pronounced dead at the scene.

A *post mortem* examination in Malta concluded that cause of death had been immersion pulmonary oedema (IPO) or "drowning from the inside", a condition that can arise in divers and swimmers. It also noted that Matthews had an enlarged heart muscle, possibly a pre-existing condition, and was obese.

However, a second *post mortem* conducted later in the UK contradicted these findings, leading to a coroner's verdict of death from natural causes.

An expert witness told the magistrate's court that a fault found in the regulator Matthews had been using would have made breathing difficult for her.

However, the other divers testified that she had not appeared to experience any breathing problems during the dive.

The regulator had later been sent overseas for further tests, but none of the testing had been carried out in the presence of a court-appointed expert, nor had the results been confirmed under oath, so the evidence was declared inadmissible.

Hedley's statements to the police had been taken before giving her the right to remain silent, making them inadmissible too, said the magistrate.

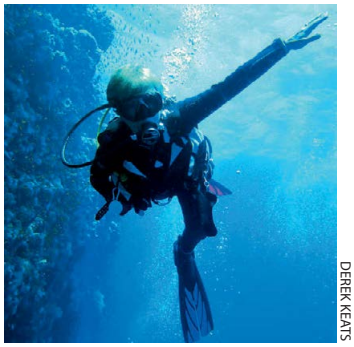
Mifsud said that the police had even failed to prove that Hedley owned the dive-centre or had rented the equipment to Matthews, or that she was aware that the regulator was faulty or improperly serviced.

He ruled that the prosecution had not established that Matthews' death had resulted from Hedley's imprudence or negligence, or that she had contributed to it in any way.

While various experts had stated that the regulator was "not in perfect working condition", other factors had contributed to the diver's death, said Mifsud. In the absence of even the most basic evidence, he said that the court had no choice but to clear Hedley of all charges. ■

LUCA ALESS

Gozo's Blue Hole site.



DEREK KEATS

Now 10-year-olds can dive the BSAC way...

AFTER DECADES OF debate, the British Sub-Aqua Club has finally decided to emulate commercial diver-training agencies and lower its minimum age for entry-level training from 12 to 10.

The issue has been controversial over the years. Club-divers' families are often involved with branch activities, with children keen to join their parents under water, but some members have regarded the knowledge and awareness required to dive safely as being difficult for some under-12s to acquire – and an additional responsibility for volunteer instructors.

The reduced age limit applies only to diver training to the level of Discovery Diver, a component of the entry-level qualification BSAC Ocean Diver (the equivalent of PADI Advanced Open Water Diver), and a depth limit of 12m will apply.

Branches can decide whether they prefer to accept younger recruits or impose their own higher minimum age limit. Those clubs that accept trainees from the age of 10 are asked to review procedures for safeguarding, risk assessment and insurance cover.

In a further step into line with commercial agencies, BSAC was set to launch its own optional eLearning platform in mid-August.

Initially the online content applied only to Discovery Diver and Ocean Diver theory modules, but with further courses to be added.

BSAC said that the move offers trainees more learning options and support, allows them to catch up on missed club lectures, saves on hard-copy materials and relieves strain on "already stretched" instructors.

Updated Discovery Diver student materials suitable for 10-year-olds are available on BSAC eLearning only. ■

SUSSEX COAST PROJECT GETS £500,000 BOOST

THE NATIONAL LOTTERY Heritage Fund has awarded a £528,600 grant to Sussex Wildlife Trust for its Wild Coast Sussex Project.

The initiative is intended to inspire the county's communities to care for the marine environment, said project manager Nikki Hills from the trust.

"Our partnership champions the rare and precious marine wildlife found locally, highlighting the extraordinary underwater kelp forests, seahorses and rays once abundant in Sussex, which could recover and thrive if local communities know about them, understand the threats and support their conservation."

Hills said that the trust would work with primary schools, 12-25-year-olds and commercial fishermen as well as the wider community to "take them on a journey to make a positive difference to the crisis in the health of the sea."

Sussex Wildlife Trust is lead partner in the project with the Marine Conservation Society, Sussex Inshore Fisheries & Conservation Authority and Sea Life Brighton.

Project activities are set to include ghost-gear removal and recycling, a Wild Beach education programme for children, citizen-science surveys, beach-cleans, volunteer training and projects involving young adults, sussexwildlifetrust.org.uk ■

Model diver Sophie O'Dea.

...as an existing young diver shows what she can do

ELEVEN-YEAR-OLD diver Sophie O'Dea pledged during the coronavirus lockdown to raise cash for her local NHS hospital trust once she was able to get out diving – and delivered in July by building a Lego model aircraft 14m down at the Capernwray inland site.

Sophie, who lives in Blackburn, spent almost an hour under water and took 44 minutes to construct the model on top of a twin-engined plane that was sunk at the site last year.

"It was good but cold," she told the *Lancashire Telegraph*. "The hard bit was getting down because I couldn't equalise, but the dive was fun… I feel good that I did it, and so proud of myself."

The young diver was observed throughout her mission by instructor Kristian Fearnley and two diving relatives, her 18-year-old brother and her stepfather. A spare cylinder was standing by, because air-sharing would not have been possible under Covid restrictions.

The long-awaited dive came on what would have been Sophie's last day at her junior school. During lockdown and unable to access a public pool to practise her underwater Lego building, she had used an inflatable pool in the garden.

Sophie, whose ambition is to work as a police search diver, raised £660 for East Lancashire Hospital Trust through a JustGiving page. ■

HIRO YOSHIDA / DHSC PROJECT

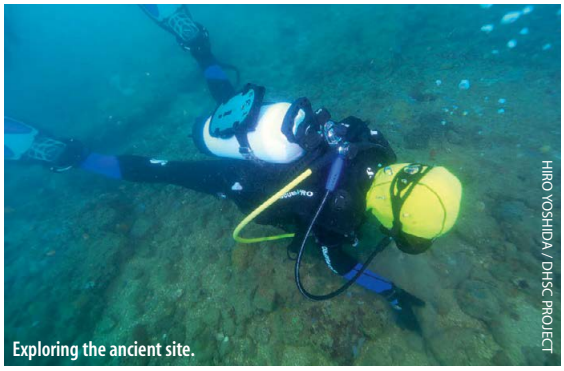
Divers' ancient finds confound experts

SCUBA-DIVERS HAVE found stone artefacts off north-western Australia that date back as far as 8500 years, to when the archaeological sites would have been on dry land.

The submerged sites are the first of their kind to have been found on Australia's continental shelf.

Archaeologists from Australia and the UK homed in on the sites initially by analysing geological charts and archaeological sites on land, and then moved offshore using drone-mounted laser scanners and high-resolution sonar-scanning from boats. The divers then went in to scour the shallow sites.

When the first people arrived in Australia from south-east Asia some 65,000 years ago, seas around the continent were 80m lower than current levels, and over the next 45,000 years until the end of the last Ice Age the level fell by another 50m.



HIRO YOSHIDA / DHSC PROJECT

Exploring the ancient site.

At this time the continent would have been some 770,000 square miles bigger than modern Australia, extending 100 miles further out to sea and with many people living on the coastal shelf.

But as sea levels rose again up to 8000 years ago, as much as a third of the continent was submerged, with many of those settlements inundated.

Exploring two sites near the port of Dampier in the Pilbara region of Western Australia, the divers found 269 stone artefacts dating back at least 7000 years on the seabed in shallow water (2.4m) at Cape Bruguieres Channel. The items were identified as tools and grinding stones.

Then at depths of around 14m in a freshwater spring in Flying Foam Passage they found a further trace of human activity – a single stone tool that was at least 8500 years old.

The tools differed in style from those previously found on land. The environmental data and radiocarbon dating showed that the sites must have been at least 7000 years old when rising seas left them submerged – overturning the previous belief of many archaeologists that no trace of the occupants of these areas could have survived rising sea-levels.

"If you're looking for the whole picture on Australia's ancient past, you've got to look under water, there's just no question," said Prof Jonathan Benjamin of Flinders University, who led the study. Also involved were James Cook University, the University of Western Australia, the University of York in the UK and Airborne Research Australia, collaborating with the Murujuga Aboriginal Corporation.

The researchers say that with such a big area of "Sea Country" still to explore, they are confident of finding many other submerged sites, enabling a better understanding of the ancient people who lived there.

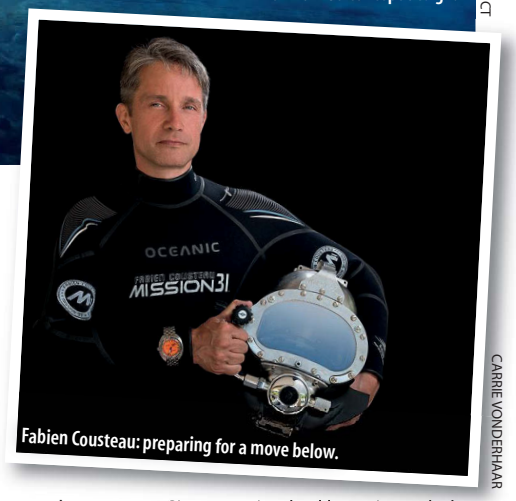
However, Australia's recently passed Underwater Cultural Heritage Act does not automatically protect such sites, they say, calling for legislation to protect and manage Aboriginal cultural heritage along the coast.

The discoveries came as a result of field studies carried out between 2017 and 2019 but the study has just been published in the journal *PLOS ONE*. ■

YVES BEHAR & FUSEPROJECT

The PROTEUS concept design.

PROTEUS: Undersea habitat of the future



CARRIE VONDERHAAR

Fabien Cousteau: preparing for a move below.

OCEAN EXPLORER and environmentalist Fabien Cousteau has announced an ambitious plan to build over the next three years "the world's most advanced underwater scientific research station and habitat" at a depth of 18m in a marine protected area off Curaçao in the southern Caribbean.

Called PROTEUS, he says the station's mission will be to address critical global concerns in terms of requirements for new medicines, sustainable food supplies and tackling the effects of climate change.

"As our life-support system, the ocean is indispensable to solving the planet's biggest problems," says Cousteau. "Challenges created by climate change, rising sea levels, extreme storms and viruses represent a multi-trillion-dollar risk to the global economy."

He says that he envisions PROTEUS as the underwater version of the International Space Station, providing a platform for scientific collaboration among the world's leading researchers, and the first in a network of such habitats.

More than four times bigger than any previous underwater habitat, PROTEUS would contain state-of-the-art laboratories, sleeping quarters and a moon pool. An underwater greenhouse would enable the inhabitants to grow fresh plant life for food, and the station would be sustainably powered using hybrid sources including wind, solar and ocean thermal energy conversion.

Scientists and aquanauts would be able to conduct continuous night and day saturation dives, and organic samples collected could be processed and studied in real time.

"PROTEUS is a hopeful step forward in spreading the message that we must protect the ocean as if our lives depend on it," said marine biologist and underwater explorer Dr Sylvia Earle, Ocean Ambassador of the Fabien Cousteau Ocean Learning Centre behind the project.

"Living under water gives us the gift of time and the incredible perspective of being a resident on the reef. You're not just a visitor any more."

Project partners include Northeastern University, Rutgers University, Caribbean Research & Management of Biodiversity Foundation and University of Rhode Island.

The cost of the build is projected as US $135 million, to be provided by a mix of private and public donors.

Site-mapping had been intended to begin in July but was pushed back by the coronavirus to September, **DIVER** was told. Cousteau was set to dive the proposed site with a local team as soon as possible.

After that the plan was to have the habitat completed within around three years of the site-mapping, although research into aspects such as local water quality and plastics content could begin immediately.

In 2014 Cousteau led a team of five aquanauts to set a new record of 31 days for time lived under water, at the Aquarius habitat in the Florida Keys.

The team was said to have performed three years' worth of equivalent research in that time, resulting in 12 published scientific studies and 9800 scientific articles.

In 1962 Fabien's grandfather Jacques-Yves Cousteau began the process of building underwater research habitats with his *Conshelf I, II* and *III* projects in the Mediterranean and Red Sea. ■

PADI INTRODUCES CHAT PODCAST

DIVE STORIES **is a new podcast that training agency PADI says has been designed "to immerse audiences in the underwater world, keep them connected to the dive community and inspire them to seek adventure and save the ocean".**

PADI says that the monthly *Dive Stories* episodes will feature in-depth conversations between host 'Ocean' Allison Albritton and inspirational guest-divers, covering scuba, freediving, underwater exploration, travel, conservation and related themes.

"Now, with access to diving limited in many parts of the world, we find it more important than ever to provide additional opportunities for divers and water-enthusiasts to seek adventure and save the ocean while out of the water," says PADI.

Listeners can subscribe via apps such as Apple Podcasts, Google Podcasts, Spotify or Stitcher. ■

Red alerts on global map – 20% of reefs now have no sharks

Red circles are bad news on the Global FinPrint map.

GLOBAL FINPRINT

A hammerhead passes the chum cam.

GLOBAL FINPRINT

SHARKS HAVE BECOME too rare to fulfill their normal role in the ecosystem on many of the world's coral reefs, making them functionally extinct. So say the scientists behind Global FinPrint, described as the world's largest reef shark and ray survey and the first of its kind.

No sharks at all were observed on almost a fifth of 371 reefs surveyed in 58 countries, indicating "a widespread decline that has gone undocumented on this scale until now".

However the 120-strong survey team, led by researchers at Florida International University, also identified areas in which conservation was succeeding, and the measures that could turn the tide.

Launched in 2015, Global FinPrint involved the deployment of 30-100 "chum cams" – baited remote underwater video systems – on each reef for an hour at a time to record sharks, rays and other marine life. More than 20,000 hours of footage was recorded.

Behind the initiative was the late Microsoft co-founder Paul G Allen, who also began the successful Vulcan Inc deep-wreck-hunting expeditions of recent years. Global FinPrint observers focused on the western Atlantic, Indian Ocean, western Pacific and central Pacific regions, and were co-ordinated by Florida International, Curtin, Dalhousie and James Cook universities and the Australian Institute of Marine Science.

Only three sharks in total were found on all the coral reefs surveyed across the Dominican Republic, French Antilles (Guadeloupe, Martinique, St Martin & St Barthélemy), Kenya, Vietnam, the Windward Netherlands Antilles (St Maarten, Saba & St Eustatius) and Qatar. Their absence was ascribed mainly to overfishing, and particularly the use of destructive methods such as longlines and gill-nets.

However, the study also revealed those nations in which shark conservation was said to be working.

Best-performing compared to the average of their regions were Australia, the Bahamas, the Federated States of Micronesia, French Polynesia, the Maldives and the USA.

"These nations are seeing more sharks in their waters because they have demonstrated good governance on this issue," said Aaron MacNeil, lead author of the Global FinPrint study, now published in *Nature*.

"From restricting certain gear types and setting catch limits, to national-scale bans on catches and trade, we now have a clear picture of what can be done to limit catches of reef sharks throughout the tropics."

"Now that the survey is complete, we are also investigating how the loss of sharks can destabilise reef ecosystems," said study co-lead Mike Heithaus. "At a time when corals are struggling to survive in a changing climate, losing reef sharks could have dire long-term consequences for entire reef systems."

"While Global FinPrint results exposed a tragic loss of sharks from many of the world's reefs, it also shows us signs of hope," said Jody Allen, co-founder and chair of the Paul G Allen Family Foundation.

"The data collected from the first-ever worldwide survey of sharks on coral reefs can guide meaningful, long-term conservation plans for protecting the reef sharks that remain." The global interactive data-visualised map of the Global FinPrint survey results can be found at globalfinprint.org


Diver with crown-of-thorns starfish.

NPS

EARLY WARNING SYSTEM FOR CORAL THREATS

A NEW SCIENTIFIC prediction tool could provide an early-warning system of the two most destructive disturbances faced by coral reefs – bleaching and crown-of-thorns starfish (COTS).

The Marine Laboratory at the University of Guam says existing prediction tools typically warn of coral-bleaching events two to three weeks in advance, whereas its new model extends this period to 3-5 months – while also providing for the first time the ability to predict COTS outbreaks in good time to arrange preventive action.

The researchers concentrated on the interaction of two major oceanographic events in the Pacific: El Niño and the Pacific Decadal Oscillation (PDO).

From 82 survey sites on Micronesia's main islands they analysed sea temperatures going back to 1980 as well as biological data since 1998.

Studying the two patterns together made it possible to build models that accurately predicted both maximum sea-surface temperatures and the movement of chlorophyll-filled nutrient plumes around the tropical Western Pacific. These "warm blobs" of seawater and excess nutrients attract plankton and are what leads to coral-bleaching and COTS invasions, say the researchers.

The scientists have predicted COTS outbreaks in eastern Micronesia this year, providing time for Kosrae to plan its response, and can alert other islands in the line of attack.

"It takes management from a reactive position to a more proactive one," said Peter Houk, senior author of the study. "Not a lot can be accomplished with only a couple of weeks' notice, but predicting bleaching and starfish disturbance events a few months out may give governments and other agencies more time to acquire supplies, create legislation, and create support networks to ensure that reefs are better equipped to handle these forces."

The next step is to build an online site so that scientists and resources managers can access the predictive model and go on improving it. "These results may be transferable to other oceanic regions to help predict coral-reef status at even larger scales," say the researchers.

The Yap Community Action Program, Conservation Society of Pohnpei, Palau International Coral Reef Centre and the Florida Institute of Technology were also involved in the study, which is published in *Nature Research's Scientific Reports*.

Divers find Americas' earliest known ochre-mine

Diver Christophe La Maillot explores La Mina.

SAM MEACHAM / CINDAQ, BC SAS-INAH

CAVE-DIVERS HAVE discovered a red-ochre mine in a cave system on Mexico's Yucatan peninsula – and learnt that it was worked between 12,000 and 10,000 years ago, making it the oldest-known such mine in the Americas.

The system of *cenotes* and underwater passages in Quintana Roo lies 5-6 miles from the Caribbean coast, though its exact location is being kept secret.

It was found three years ago but the research team have only now released their study of the previously unsuspected prehistoric mine, preserved just as it was left by the last miners.

Red ochre has been the most commonly identified inorganic paint used through history worldwide.

No evidence of how the early miners used it is thought likely to survive at the site, but they could have valued it as a medium for rock-painting or body decoration, tanning animal skins or, with its high arsenic content, as an insect-repellant.

Ten skeletons dating back to the same Pleistocene-Holocene period have been found to date in Quintana Roo's flooded cave systems, and experts had until now supposed that the people had sought water or shelter in the then-dry caves. Now it seems that these early explorers had another reason to head underground.

The "La Mina" site was discovered by cave-divers Sam Meacham and Fred Devos from CINDAQ (Research Centre of the Quintana Roo Aquifer System), later joined by Eduard Reinhardt from McMaster University in Canada. Underwater archaeologists from INAH (Mexico's National Institute of Anthropology & History) joined the team to continue the investigations.

La Mina, a 900m series of underwater passages in places no more than 70cm across, was found in one of the system's three caves, Sagitario. There Meacham and Devos noticed that many of the stalactites and stalagmites were broken in half, while stones had been deliberately stacked in small triangular piles.

There were also heaps of coal on the floor, soot marks on the ceiling and carved-out cavities on the ground containing traces of what turned out to be ochre.

The researchers now believe that the prehistoric miners illuminated the caves by burning coal in fire-pits, and that they used the speleothem tips as digging tools to break through the limestone surfaces to the many tonnes of ochre within.

The stone cairns were probably built for use as navigational markers.

Radiocarbon dating confirmed that the ochre had been mined 10-12,000 years ago. The caves were flooded some 7000 years ago, by which time they would probably have been long abandoned. Underlining the age of the site, Yucatan's Mayan civilisation originated about 4500 years ago.

The dive-team took more than 20,000 photographs of La Mina using 360 underwater cameras over 600 hours of diving. These were used to create a 3D model of the site to allow the archaeologists virtual access.

Being able to carry on the work remotely in laboratories in Mexico, the USA and Canada was vital in terms of safety, says Meacham, noting that the slightest shift in the cave's sediment would lead to total loss of visibility.

"Thanks to La Mina we now know that early humans not only risked their lives by entering the labyrinth of caves in search of water or to escape predators, but they also went inside them for mining purposes, thus altering them and creating cultural modifications within," says INAH.

The study is published in the journal *Science Advances*.

BROTHERS DIE ON SCOOTER DIVE AT IRISH INLAND SITE

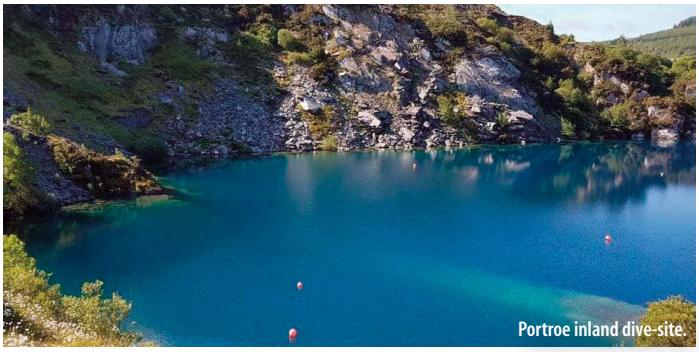
TWO BROTHERS DIED while scuba diving as one tried to rescue the other at the Portroe inland dive-centre in Co Tipperary, Ireland on 4 July.

The dive-centre, a flooded slate-quarry with depths ranging from 7-40m, had only just reopened that morning following extended closure during the coronavirus pandemic.

Brothers Fergus and Philip Brophy had been among the first customers to arrive, according to Irish press.

Fergus, 42 and Philip, 34, described as experienced divers familiar with the site over many years, had driven about 80 miles from their family farm in Ballybrittas, Co Laois.

The men had reportedly wanted to try out a newly acquired diver propulsion vehicle. They had entered the water at around 1pm, but one of them is understood to have got into difficulties about half an hour later.



Portroe inland dive-site.

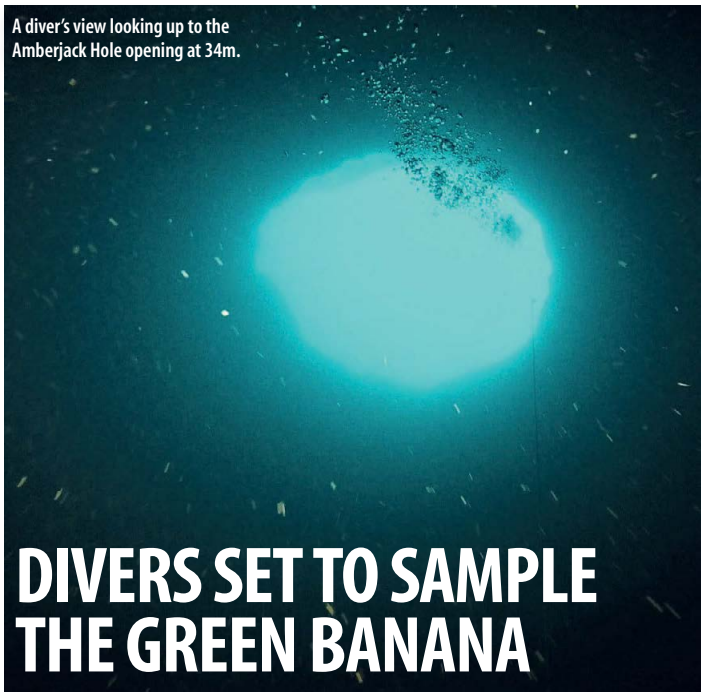
His brother went to his assistance but also then experienced problems. He was able to surface and raise the alarm but then passed out, and is said to have died shortly afterwards.

Divers belonging to two separate search and rescue teams who had been carrying out training exercises nearby recovered the surfaced diver, and his brother's body was found at a depth of around 25m.

The emergency services attended and both divers were pronounced dead at the scene before being taken to University Hospital Limerick for post-mortem examinations. Police and the Health & Safety Authority were investigating the incident.

Portroe quarry has been run as a dive-centre for the past five years, following years of being used by divers regarded as trespassing on private land. It is described as one of Ireland's best inland dive-sites, diveable in all conditions and with visibility of 10m-plus.

With diver attractions including training platforms, a pub, stone huts, cars, a boat and a winch, it is popular with divers from all over the country for recreation and training.



A diver's view looking up to the Amberjack Hole opening at 34m.

NOAA

DIVERS SET TO SAMPLE THE GREEN BANANA

US SCIENTISTS WERE PREPARING to explore a mysterious "blue hole" site in the Gulf of Mexico dubbed Green Banana in August, with a follow-up expedition set for next May.

Little is known about blue holes, says the National Oceanic & Atmospheric Administration (NOAA). Its Office of Ocean Exploration & Research is supporting the project, and it says that the distribution and abundance of such submerged sinkholes is unknown. Their openings can be deep beneath the sea surface and sometimes too small for an ROV to penetrate.

The first reports of Green Banana and other such sites came not from scientists but from recreational divers and fishermen, says NOAA.

Last year a research team from Mote Marine Laboratory, Florida Atlantic University/Harbor Branch, Georgia Institute of Technology and the US Geological Society explored a shallower sinkhole they called Amberjack Hole, 30 miles west of Sarasota in Florida.

Now they plan to use techniques they developed there to explore the hourglass-shaped Green Banana. Its rim is 47m beneath the surface and the bottom about 130m deep, making it particularly challenging to explore.

The 107m-deep Amberjack Hole, with its 34m-deep rim, was the team's most detailed blue hole investigation to date. They used scuba divers at full depth and deployed a "benthic lander", a 270kg frame containing multiple scientific instruments, to sample the water and bottom sediments, documenting life around the rim and microscopic life throughout the hole.

Amberjack Hole turned out to contain large amounts of dissolved inorganic carbon, which can support certain kinds of life, including microbes. The scientists believe that nutrients rise from the blue hole to feed larger organisms, some of which drop into the hole to create a "positive feedback cycle".

This could explain the biodiversity of blue holes, which NOAA says can contain corals, sponges, molluscs, turtles, sharks and more.

At the bottom of Amberjack Hole the divers had been surprised to discover two dead but intact smalltooth sawfish, an endangered species, one of them 3m long.

With their forthcoming expedition the scientists hoped to discover whether the blue holes are in fact connected to Florida's groundwater; if they are secreting nutrients; whether such micro-environments harbour unique or new species of microbes; and whether the blue-hole area should be protected. ■

NOAA

The benthic lander.

Freda's Diver Dishes

Well, since my last column we have taken guests out diving on *Sea Leopard*. How great it was to get back in the water! I knew it was going to be a good dive day when I saw a dolphin in Portland Marina that morning. We had great vis on the *James Fennel*, spotted tons of nudibranchs and I'm already looking forward to our next trip out. I have chosen this dish because it's absolutely divine, very easy to make – and I love a curry!

Mango Masala Spiced Cod with Butterbean Curry

Serves 2 divers

Ingredients

30ml coconut oil; 3 onions (roughly chopped); 3 cloves garlic (roughly chopped); 5cm piece ginger (finely chopped); 1 fresh red chilli (finely chopped); 1 tsp ground coriander; 1 tsp garam masala; 1 tsp turmeric; 1 tin tomatoes; 1 tin butter beans (drained); half tin spinach; 1 small (160ml) tin coconut cream; sea salt & pepper; two 200-250g fresh cod loin; 2 tsp Mango Masala spice mix.

Method

Heat the coconut oil and fry the onions gently for about 5 minutes. Add the chilli, garlic & ginger and continue to cook for a couple more minutes.

Add the garam masala, coriander and turmeric and cook gently for a few more minutes more, then add the tinned tomatoes. Continue to simmer for 10 minutes or so and then add the spinach and butter beans. Cook for another 10 to 15 minutes.

Add the coconut cream and stir, cook for another 10 minutes on a low heat, then turn off the heat and liquidise using a stick blender. Put a lid on the saucepan and leave for several hours so that the sauce can reach a really rich depth of flavour.

Drizzle some olive oil into a lidded glass dish and place the cod in the middle. Sprinkle the Mango Masala spice all over and rub it in, turning the cod to make sure it is completely covered. Season with sea salt & pepper then pop the lid on (if you haven't got a lid just use a plate). Leave in the fridge for several hours to marinade or, for best results, leave overnight.

When you are ready to complete this dish (perhaps after arriving home from a good day's diving and starving), heat your oven to 180°C and place the fish in it on a greaseproof baking tray. Cook for 20 to 25 minutes. Heat the sauce and ladle into a bowl. Place the cod on top and garnish with fresh coriander, spiced chickpeas (*see below*) and marigold petals, if you want to display your decoration skills as well as your culinary talents!

For the baked spiced chickpeas, you need 400g tin chickpeas (drained); 1 tsp rapeseed oil; 1 tsp paprika; 1 tsp cumin; 1 tsp coriander. Turn the oven to 180°C. Mix the ingredients in a bowl until well combined. Tip onto a greaseproof paper-lined oven tray and cook in the oven for 30-35 minutes. Shake them from time to time so that they dry evenly and become crunchy. Cool and store in an airtight container.

Top Tip

Make this dish plant-based by replacing the fish with tofu and preparing and cooking it in exactly the same way as the fish. Use left-over spinach in your next pasta dish. Delish!

✷ Freda Wright is a diver and chef on British diving liveaboard mv *Salutay*. Find more of her recipes in the book *40 Dives 40 Dishes*. It costs £16 plus £1.95 postage, with £1 from every sale going to Oceans Plastics Greenpeace, salutay.co.uk

Dive into Malta's Virtual Museum

The B-24 Liberator page.


The Phoenician shipwreck site.


The Fort Ricasoli guns.


Diver on HMS *Stubborn*.

HERITAGE MALTA

A SLICK NEW website bound to appeal to wreck-divers is *The Virtual Museum: Underwater Malta*.

The site is the result of a collaboration between the Underwater Cultural Heritage Unit at Heritage Malta, the University of Malta and the Malta Tourism Authority.

Its declared aim is to bring "Malta's underwater cultural heritage to the surface, with 3D documentation and public outreach as the main goals".

Most of the wrecks lie deep, down to 110m in the case of a 2700-year-old Phoenician shipwreck site, so technical divers will find the site a valuable pre-dive planning aid while less-advanced divers gain virtual access to appealing wrecks otherwise beyond their range.

An interactive map shows that most of the 10 wreck-sites lie off the east coast of the island of Malta, with the ancient shipwreck lying west of Gozo and one of four aircraft wrecks, a Consolidated B-24 Liberator, at 55m off Malta's south coast. The other WW2 bomber aircraft are a Junkers Ju88 (57m), a Bristol Beaufighter (38m) and a Fairey Swordfish biplane (70m).

Also featured are the 57m-deep submarine HMS *Stubborn* and Schnellboot *S-31* at 65m.

On the shallower side at 16m is the bow section of the WW2 destroyer HMS *Maori*; the also-shallow *Xlighter 127* and a set of Victorian guns in a collapsed section of Fort Ricasoli, only 3m deep but an awkward site to dive.

"In order to obtain full coverage of the sites multiple dives were often required, ranging in depths from a few metres to approximately 100m," said the Underwater Cultural Heritage Unit of the overall process. "Once the high-resolution imagery of the sites was obtained and converted for 3D and VR, the work on the presentation of the online platform really started.

"Each site is presented through photography, video, 3D models and the option for VR. Additionally, a historical background is provided through texts and short annotations for specific interesting features on the individual sites."

The process, from conceptualisation through the dives, data-processing and setting up of the platform to the launch took 18 months.

More sites are to be added throughout 2020 and into 2021. ■

Jim gets own site...

A NEW WEBSITE called jimsuit.com is devoted to the emergence 45 years ago of the atmospheric diving suit. Better known as the JIM suit, it was developed to enable divers to work safely as deep as 457m without the need for decompression.

The mainly pictorial website is intended to complement the book *Check for Leaks* by Richard Castle. Containing what are described as many rare photographs, it is dedicated to those who worked on the JIM suit in the 1970s and '80s with the Atmospheric Diving Group (ADG) of the Royal Naval Physiological Laboratory (RNPL) at Gosport.

The RNPL was formed in WW2 to tackle decompression issues in divers, and in the 1970s it was the need for a deep-sea diving capability, particularly in the North Sea, that saved the laboratory from closure. Castle was a core-member of the ADG, which from 1975 was tasked with evaluating the JIM suit and training divers in its use.

Although the project was abandoned in 1986, the suits were still in commercial use in the mid-'90s. ■

JIM 19 on RMAS *Clovelly* off Castle Beach, Falmouth around 1984.

JIMSUIT.COM

...as do protected wrecks

THE PROTECTED WRECK ASSOCIATION (PWA) has just launched the website ProtectedWrecks.org.uk, designed to share knowledge and promote best practice among the volunteer licensed divers who work to protect historic wreck-sites in England.

The site's unveiling coincided with the award by Historic England (HE) of a £29,000 grant to the PWA to support the divers' work.

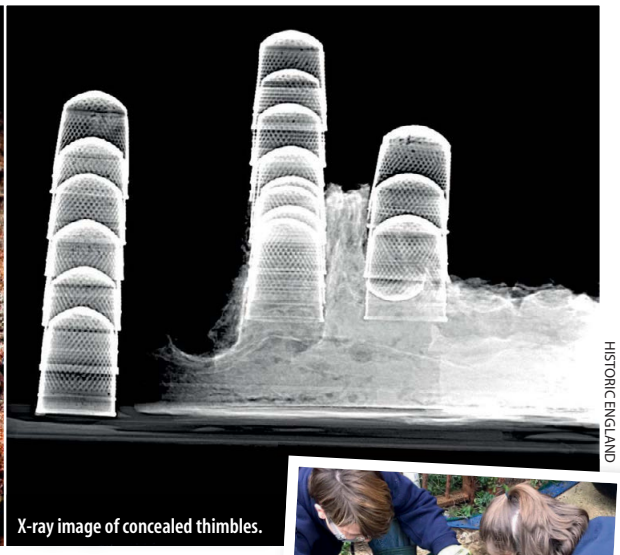
The volunteers work alongside diving contractor MSDS Marine to monitor the condition of England's 53 protected wreck-sites, which include celebrated wrecks such as the 17th-century *London* and 18th-century *Rooswijk*. The sites are covered either by the Protection of Wrecks Act 1973 or Ancient Monuments & Archaeological Areas Act 1979.

"We are delighted and grateful that Historic England has funded this project," said PWA chair Prof Mike Williams.

"It will enable us to undertake valuable work to support our members, who are dedicated volunteers protecting our maritime heritage." ■


Thimbles on the *Rooswijk*.

HISTORIC ENGLAND


X-ray image of concealed thimbles.

HISTORIC ENGLAND

X-ray grant lights up wreck investigators

ANALYSING ENCRUSTED artefacts recovered from centuries-old shipwrecks can be challenging without risking damage to the items.

Now an advanced X-ray machine is to be made available to scan artefacts from historic wrecks in UK seas, thanks to a £150,000 grant from charity the Wolfson Foundation.

The beneficiary, Historic England (HE), says that the high-resolution X-ray equipment can accommodate large objects, and has a moveable tube that is much higher-powered than typical systems.

This, it says, offers "exceptional potential for scanning and analysing objects covered in thick concretions to a much higher degree of detail than would otherwise be possible".

HE will now be able to upgrade a walk-in X-ray facility at its scientific and archaeological analysis centre at Fort Cumberland in Portsmouth.

Top of the list to be probed will be artefacts recovered from the Dutch East India Company vessel *Rooswijk*, the protected wreck site off Kent.

The *Rooswijk* sank on Goodwin Sands in 1740 while heading for Batavia (modern-day Jakarta) with a cargo including silver coins. The wreck is being excavated by HE and the Cultural Heritage Agency of the Netherlands.

"This generous investment will place Historic England at the forefront of heritage X-radiography for many years to come," said HE chief executive Duncan Wilson. "With this new technology, we will be able to analyse, conserve and better understand many more objects recovered from historic shipwrecks or excavated from archaeological sites."

The Wolfson Foundation is an independent charity that supports and promotes excellence in science and health, heritage, humanities and the arts.

"The beauty of X-ray technology is the way in which it reveals hidden secrets of the past as well as helping with conservation," said its chief executive Paul Ramsbottom.

On the same day (30 June) the Wolfson Foundation also awarded a £1.35 million grant to the Marine Biological Association (MBA) to help fund a new Marine Microbiome Centre of Excellence at Citadel Hill in Plymouth.

Focusing on marine microbes to better understand ocean health and the impacts of climate change, the centre will be the first of its kind in the UK. Construction of the £20-million site is under way and projected to be complete by late 2021.

"The research conducted at the new centre will be a lens to a marine microbial world that is critical for the planet's health," said MBA director Prof Willie Wilson.

"It is akin to the role the human gut bacteria play in human health."


Encrusted sabres from the *Rooswijk*.

TIMO'S GORGONIANS

Our feature *Local Intelligence 2* in August led off with this and another spectacular image of purple and gold gorgonians off Alonissos in Greece, but unfortunately DIVER had been misinformed about the attribution. The picture was in fact taken by German underwater photo-journalist Timo Dersch, whose work can be found at timodersch.de

UNUSUAL DIVER DEATHS OCCUR ON THE SAME DAY IN AUSTRALIA

IT'S UNUSUAL FOR an entry-level scuba diver to die on a dive – or for any level of diver to be killed by a shark. Unfortunately both rarities occurred off Australia's east coast on the same day, Saturday, 4 July.

That morning a 53-year-old woman lost her life during a shore dive at Gordon's Bay in the Sydney suburb of Clovelly.

Rebecca Rowell of Campbelltown, Sydney, was part of a group of three accompanied by a dive-guide from long-established Pro Dive, carrying out her first dive since completing her open-water course in February.

About eight minutes into the dive and half a minute after checking that his charges were OK, the guide looked back to see Rowell at the surface. An instructor from another group reached her as she lay unresponsive, her regulator out of her mouth.

The other divers ascended and Rowell was recovered unconscious but still breathing to shore.

The divers and paramedics who had responded to their emergency call carried out CPR but she was later pronounced dead in hospital.

Pro Dive operations manager Rod de Groot told press that Rowell had been "a little nervous" before the dive but that there had been no indication of any issues once under water. "We can only speculate what happened in that brief 30 seconds we weren't sighting her," he said.

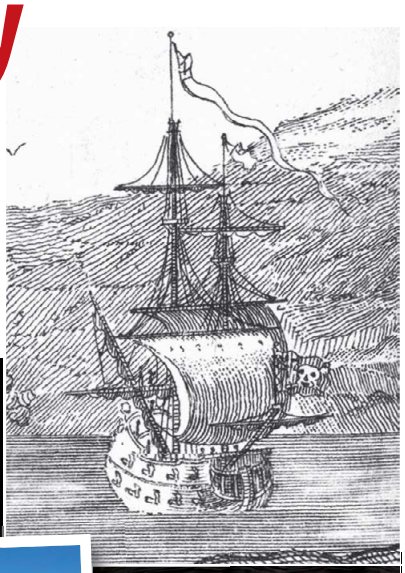
Eight hundred miles further north a few hours later Matthew Tratt, 34, sustained what proved to be a fatal shark bite to his left leg at Indian Heads, a site known for its great white and other shark activity, off Fraser Island in Queensland.

Tratt was widely reported in the press to have been spearfishing while scuba diving, although it seemed more likely that he was in fact freediving.

Tratt's brother Rob managed to bring him back to the rocky shore, where he was given first aid for an hour by an off-duty doctor and nurse. Paramedics arrived by helicopter but he was reported to have suffered significant loss of blood and was declared dead at the scene, two and a half hours after sustaining the bite.

Police were investigating both incidents to prepare coroner reports.

Blackbeard knew exactly what he was doing



Lead sheathing on the *QAR*.

CLUES RECOVERED by a dive-team support speculation that when the pirate Blackbeard ran his flagship onto a sandbar at Beaufort, North Carolina 300 years ago, it was a deliberate act.

The wreck of the 31m *Queen Anne's Revenge*, or *QAR*, was discovered at a depth of 9m in 1996.

Since then more than 30 cannon have been identified and some 300,000 artefacts recovered – thought to represent 60% of the total.

Maritime archaeologist Jeremy Borrelli of East Carolina University has been diving and researching the shipwreck since 2012, and has been looking into lead sheathing thought to have been used to repair a badly leaking hull.

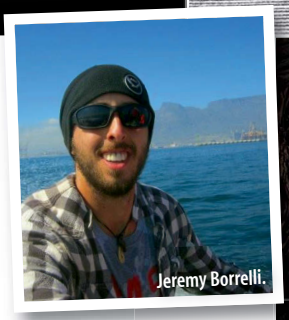
The evidence reinforces the views of some historians that the *QAR* was driven ashore "in a premeditated move by Blackbeard to rid himself of a ship that he felt was no longer serviceable", says Borrelli.

Edward Teach *aka* Blackbeard captured the ship near St Vincent in 1717, the year before its loss. At that time a French transatlantic slave-trader called *La Concorde*, it had been recorded as having developed several major leaks as far back as 1711.

Sheets of lead would be kept on ships in those days to be cut to size as needed to plug such leaks.

"We know that the ship had documented cases of significant leaks forming in the hull prior to its capture by Blackbeard and his pirates," said Borrelli. "After it was captured, Blackbeard kept the pilot, two carpenters and the caulker from the French crew.

"These individuals would have a good working knowledge of the ship's condition, and so this decision to keep them makes sense to increase the longevity of the pirate's newly acquired prize."


Jeremy Borrelli.

Leaks would be patched up.

NCDNCR

The patched-up leaks didn't stop Blackbeard sailing the renamed ship between Africa and the Caribbean for six months, attacking British, Dutch and Portuguese merchant ships along the way.

Borrelli said that additional study of the remaining timbers and other features was likely to put beyond doubt whether "the leaky hull was either a mistake or a calculated manoeuvre on the part of one of history's most infamous pirates".

His preliminary findings have been published in the *International Journal of Nautical Archaeology*.

Must-Hear But Scary Wildlife film-maker and diver Dr Ellen Husain investigates the antibiotic-resistant super-bugs breeding in our coastal seas, and the threats they pose to marine life – and to divers! Her new *Costing the Earth: Swimming in SuperBugs* is on Radio 4 on 22 September, and after that on BBC Sounds, Spotify and iTunes.

Game Over Another oceanic threat, this time deep mining, but the Deep Sea Conservation Coalition has a fun way to combat it in the form of a Space Invaders-style online game, savethehighseas.org/gameover

Wetpixel Live This series of video conversations with leading underwater image-makers is dedicated to answering photographers' FAQs. Find it on the YouTube channel of Wetpixel's website, hosted by editor Adam Hanlon with regular contributions from Alex Mustard.

On the Cards The Protected Wrecks Top Trumps game is a good way of learning more about England's prized sites. We like that the TT values are based on the accessibility of each site, msdsmarine.com

Woman sandwiched between humpback whales at Ningaloo

A 29-YEAR-OLD woman sustained fractured ribs and internal bleeding after finding herself trapped between two humpback whales while snorkelling on Ningaloo Reef off Exmouth in Western Australia.

She was airlifted from the boat to Royal Perth Hospital in a serious but stable condition following what was described as a freak accident on 2 August, and was expected to make a full recovery.

Other people in the group were understood to have sustained minor injuries during the whale interaction. WorkSafe, the Australian equivalent of the Health & Safety Executive, is reported to be investigating the incident.

Each year the whales follow the "Humpback Highway", migrating more than 3000 miles from their Antarctic feeding grounds to breed and give birth in the warm waters off Australia.

Ningaloo, the continent's biggest fringing reef, is a global hotspot for surface interactions not only with the whales but with whale sharks and manta rays.

The injured woman was on one of a number of humpback interaction tours that provide the opportunity to snorkel with the whales whenever it is deemed safe to do so. Many scuba-divers visiting the area aim to participate in such surface interactions, either on dedicated trips or from their dive-boat.

RESTORED TO LIFE

It's been an odd year, 2020. It started with a horrible, wet winter and early spring, then dried up suddenly to deliver some very hot, dry weather.

We've had, and continue to have, coronavirus. We've also had outbreaks of bubonic plague, swarms of flying ants dense enough to show up on radar, and the first cases of two tick-borne diseases ever recorded on British shores, and we still have more than a third of the year to go.

So when I read that a Japanese scientific team researching 100-million-year-old seabed sediment had discovered bacteria that promptly surged back to life and began to grow and multiply, I was a tad concerned.

The bacteria are oxygen-using microbes that had been trapped in what was once ooze and become dormant. They are 101.5 million years old, say the scientists.

Reassuringly, they also tell us that the bacteria present a very low risk to human health, arguing that there would have been no similar host to infect in the time from which they came, so they probably won't be capable of harm.

I'm not reassured. Have these guys not seen the *Godzilla* movies? Have they no idea what happens when ancient life-forms suddenly awaken?

And in a year already blighted by plagues? We're doomed, I tell you!

Risk assessment

When people wonder if scuba-diving is risky it's usually being eaten by sharks that concerns them. But now comes a paper in a recent edition of the *Journal of Insurance Risk* that nicely sums risk up.

We're told that the factors to concern us re poor fitness, obesity, chronic diseases, coronary artery disease and structural abnormalities of heart and lungs, plus inexperience and a history of irresponsible behaviour.

Two thoughts struck me. First, that nowhere does the paper mention being under water and probably quite far from something to breathe if your equipment fails. This must mean that modern dive-gear is so good that we can pretty much rule out equipment failure. Great news!

Second, you could take the same list and apply it to anything you like with the same accuracy. Instead of diving you could have golf, or flower-arranging for that matter.

It's oddly reassuring to think that the most hazardous part of any dive trip is the drive to the site.

Catch of the day

Of course, there are sometimes risks we can't foresee. Like the Alabama diver reportedly hooked by a game angler and reeled to the surface.

I will admit to some reservations about this story, such as why the victim didn't just cut the line, but if it did happen, I just hope our diver didn't have a deco obligation.

We don't want it

Remember the statue of Edward Colston being dropped into Bristol harbour? Leaving it in the water might have been fitting, given his involvement in the slave trade, but it's been fished out for now.

CAITLIN HOBBS

Worldwide, statues of similar human detritus have been quietly removed from their plinths and people are trying to decide what to do with all this Victorian bronze. One suggestion, made before Colston's statue even hit bottom, was to place them under water as an attraction for scuba-divers.

Yes, well, what makes the proposers think that divers are any less revolted by the business practices of these leeches than anybody else?

I'm more than happy to have things under water to explore, but I can manage to find enough places to go diving without needing to see statues of mass-murderers.

Flashes of anger

Members of the Rockport Back Beach Neighbors (sic) Committee in the USA are concerned about clanging air tanks and public nudity caused by unregulated scuba-diving outside their beach-front properties – activities, they allege, that are destroying their enjoyment of their homes. They're so concerned that they're suing the town council.

The main discussion seems to revolve around the alleged nudity. Local diving instructors say they've been working in this part of Massachusetts for 35 years and never seen anything unseemly. They say the beaches are used by swimmers, paddleboarders and kayakers too and that divers are being singled out.

However, the residents insist that the divers' lack of clothing is disturbing the minds and morals of their grandchildren.

I'm pleased for the committee members that the only thing they have to worry about at a time like this (see my first item) is a quick glimpse of the pink stuff.

Rari recovery

I don't think I'd want a Ferrari – I couldn't afford the insurance or the petrol – but one has recently become available after spending 26 years in a canal.

The paintwork on this Mondial is still in half-decent nick, and a wipe with an oily rag and new plugs and it'll probably run as well as it ever did. Any halfway competent dive-club equipment officer could probably sort it out.

Reported stolen in 1994, the car was discovered by Dutch firefighter-divers on a training exercise and eventually recovered by a joint police and military dive-team.

After determining that there was no crime connection other than the theft, and no way of identifying the thieves, the case was closed and the car was to be sent for scrapping. Except that various enquiries were made to have it to put on display.

Most divers of a certain age might have the odd diving souvenir in their garages, but I'm sure there can be very few with an intact Ferrari.

Nordic Diverworld

You wouldn't think it was needed, but Bergen in Norway is about to get an underwater trail for divers incorporating shipwrecks and other structures to be explored.

It's to be part of a larger development offering visitors a star-shaped swimming pool with high-diving boards, saunas and an urban beach for sports such as volleyball, all sounding like some sort of 1950s US leisure complex.

Having been to Bergen, I'm sure it will be well done, and the dive-experience should be great. The water was teeming with fish and the vis superb when I was there, but I do wonder why we need a theme-park type experience when the real thing, so to speak, is already accessible and wonderful?


WHITE ARKITEKTER

I hope it's not just to make more profit from it, selling fast food and T-shirts. What a glum thought.

FREEDOM DIVER

The anticipation and excitement was palpable, says LISA COLLINS. After 12 weeks, she had the go-ahead: she could go diving again!

ON 24 MARCH the government of the Cayman Islands, where I currently live and work as an underwater photography instructor, banned all water sports, including diving, as part of aggressive lockdown measures to try to curb the spread of Covid-19.

The coronavirus had been brought to the island by a lone cruise passenger who had been evacuated ashore to a hospital after suffering several heart attacks.

Ten days after his arrival, he started exhibiting coronavirus symptoms. He died of heart failure, but not before infecting some of the intensive-care unit staff. The virus was not yet familiar and, because he had shown no symptoms, he hadn't been quarantined. Heightened safety protocols were not yet in force.

The infected ICU staff were put into quarantine as soon as they tested positive, but the virus had found its way to family-members and friends before lockdown was imposed.

Strict curfews, social distancing, groups of no more than two, bans on gatherings in public places, limited opening of beaches for exercise and complete lockdown from 7pm on Saturday nights to 6am Monday mornings had people scared and mostly complying with the safety regulations.

Right: 3m-tall Amphitrite the mermaid is a feature of the shore-dive.

Below: One of the first divers back in the water after lockdown at Sunset House.

Above: Lee and Reid ready to welcome divers back to the dive-centre.

Right: Tiger grouper and lionfish among the life on the *David Nicholson* WW2 landing-craft wreck.

Below: Lisa was happy to find that the roughhead blenny was still on the wreck.

Then came Good Friday! Traditionally a big holiday in the Caribbean, many people gathered for day-long beach parties in the traditional way. The police could do little – people would see them coming and separate into groups of two before they arrived. Only warnings were issued, but the damage was done. The virus spread throughout the community.

At the next daily press conference, Premier Alden Maclaughlin banned all access to beaches or waterfronts – no walking, swimming, snorkelling, fishing, boating or, of course, diving.

For a small Caribbean island nation, people felt this to the core. Sparkling turquoise oceans interspersed with dark reef, soft sandy beaches and gentle surf tantalised as it was glimpsed from nearby roads. We would long for access to the sea.

YOU MIGHT WELL THINK: "Oh, poor you, diddums can't go in the sea, but you're so lucky to live in a country that millions would give their eye-teeth to be able to visit on holiday." I get it.

But we don't have parks or vast commons on which to walk. There are no cycle-paths or places for running. Walking along the road you take your life in your hands because driving standards aren't the best, and as temperatures rise through spring, exercising in 30-32° heat with 80-90% humidity is almost unbearable.

And except for the mega-rich, we don't have nice gardens to sit out in. The beaches and sea are our places of exercise and relaxation. They keep us sane.

Diving is not only a key part of my job but my passion. On almost every day off, weather allowing, I would go diving. So that ban hurt.

With so much uncertainty around the virus, along with reports that getting it badly might preclude you from ever diving again because of lasting lung damage, it was a very dark time for me.

The days melted into each other, and always that glimpse of the ocean on our daily walk struck a bum note.

It was seven weeks before the premier decided that we could go back to the beach, but only three times a week, on our surname days, to swim for exercise only for 90 minutes a day, and no snorkelling.

It was something, and bliss the first time back but, wait… anglers could fish from shore any day but Sunday, for as long as they wanted. A little unfair?

Two weeks later, we were allowed to snorkel, kayak or paddleboard for 90 minutes a day three times a week, but fishermen could now go out on boats any day they liked for as long as they wanted, as long as there were no more than six on a boat. And we still couldn't scuba-dive!

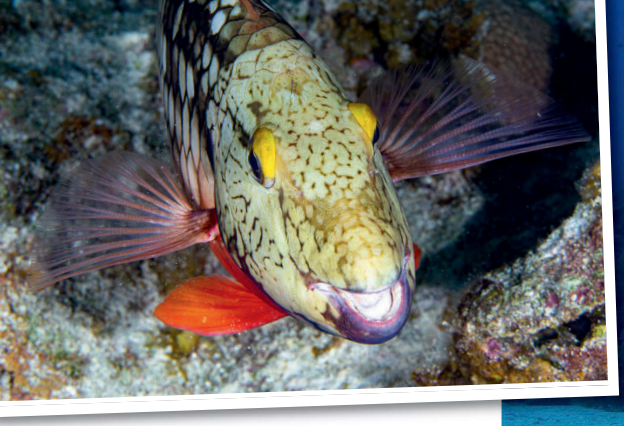
Many dive-operators questioned this. Scuba, when performed from shore in buddy-pairs using their own equipment, causes little risk of transmission and is the epitome of social distancing.

But the government seemed to ignore scientific reports and thought diving too risky because "*people shared masks and snorkels and there is a lot of saliva involved*"!

Finally, almost three weeks after every other non-contact sport had been allowed to resume, the diving community celebrated as one. It was announced on Thursday 18 June that shore-diving with one's own equipment in buddy-pairs would be allowed from that Sunday.

DIVE-CENTRES WITH shore-diving facilities scurried to make sure protocols were met and new waiver forms were designed and distributed.

Cathy Church's Photo Centre, where I work, is located at Sunset House, and



its dive-centre offers a wonderful shore dive over a wide area. Sunset Divers' manager Lee Buckingham is from the UK. In return for some photos of the dive-site he had let us store tanks in the centre in case we should be allowed to dive again before Sunset re-opened.

Sunset Divers planned to open at 7am, but Mateusz and I hoped to get in the water before the throngs of excited divers expected to be queuing at that time.

Of course, many had by then been left unemployed and had to leave the Cayman Islands. Tourism, which accounts for more than 70% of the economy, was not set to reopen before 1 September.

Lee was fine with us getting a head-start, so we set our alarms for 4.15 and were in our car as curfew ended at 4.30.

The roads were eerily quiet. We had loaded the tanks and our gear into our car the night before, so only had to kit up in the pre-dawn.

Excitement with a hint of apprehension overtook me as I checked, double-checked and triple-checked the equipment. It felt as if I hadn't dived in years; in reality it had been almost three months to the day.

WE WALKED THE SHORT DISTANCE to the ladders. Dawn was breaking rapidly, and we could clearly see the bottom at 3m.

The water enveloped me like a warm hug. At 30°, it was decidedly warmer than the 26° on my last dive in March.

We planned to surface-swim to a mooring buoy marking the start of the reef, then descend over the reef past the bronze mermaid statute Amphitrite, out across the sand to the *David Nicholson* wreck.

We would concentrate on macro life, thinking it would be too dark for wide-angle photography. It felt so good to work those leg-muscles on the swim out to the buoy, where I could still see the sandy bottom 6m below. Wow!

We descended, breathing slowly and adjusting to being back under water, and began to swim towards the reef. Everything seemed brighter and more colourful than I remembered.

Beautiful soft corals, gorgonians and bright purple and red finger sponges stood proud against the reef.

Fish that had woken refreshed swam about looking for food. So much life!

We had seen a large giant barracuda on the bottom several times while snorkelling in the past few weeks. We couldn't see it at first, but after a few minutes I thought I felt something watching me. As I turned, I saw the barracuda stalking me only 10m away.

It turned and swam away, but several times later I had the same feeling, and would turn to see it there again.

Passing over Amphitrite at 10m, we swam over the white sand to the *Nicholson* some 150m away, descending slowly as we reached it.

A little north-south current was trying to push us off our direct line, so we had to crab-swim to the wreck. A southern sting ray was searching for crustaceans, wafting up clouds of sand.

The *David Nicholson* is a small landing-craft with its stern section missing, an open bottom over three-quarters of its length and a covered bow. Standing upright, stern towards shore, it is covered in coral, gorgonians and sponges.

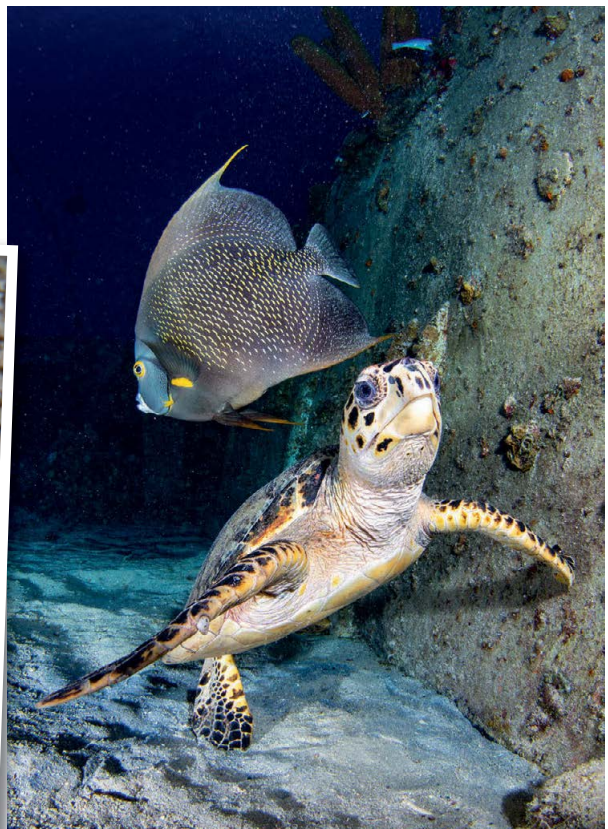
Splitting up, we each headed to our favourite sections. At the end of the side-panel where the stern went missing we had found a tiny roughhead blenny that had burrowed into a piece of hard coral protruding from the hull. I wanted to see if it was still there.

I had forgotten how small it was but eventually I found the blenny, unfussed as I took a few photos of it in its home.

Close by a goldface toby usually lurked, and I was happy to see it still hiding in the corals beside its coral-grouper neighbour.

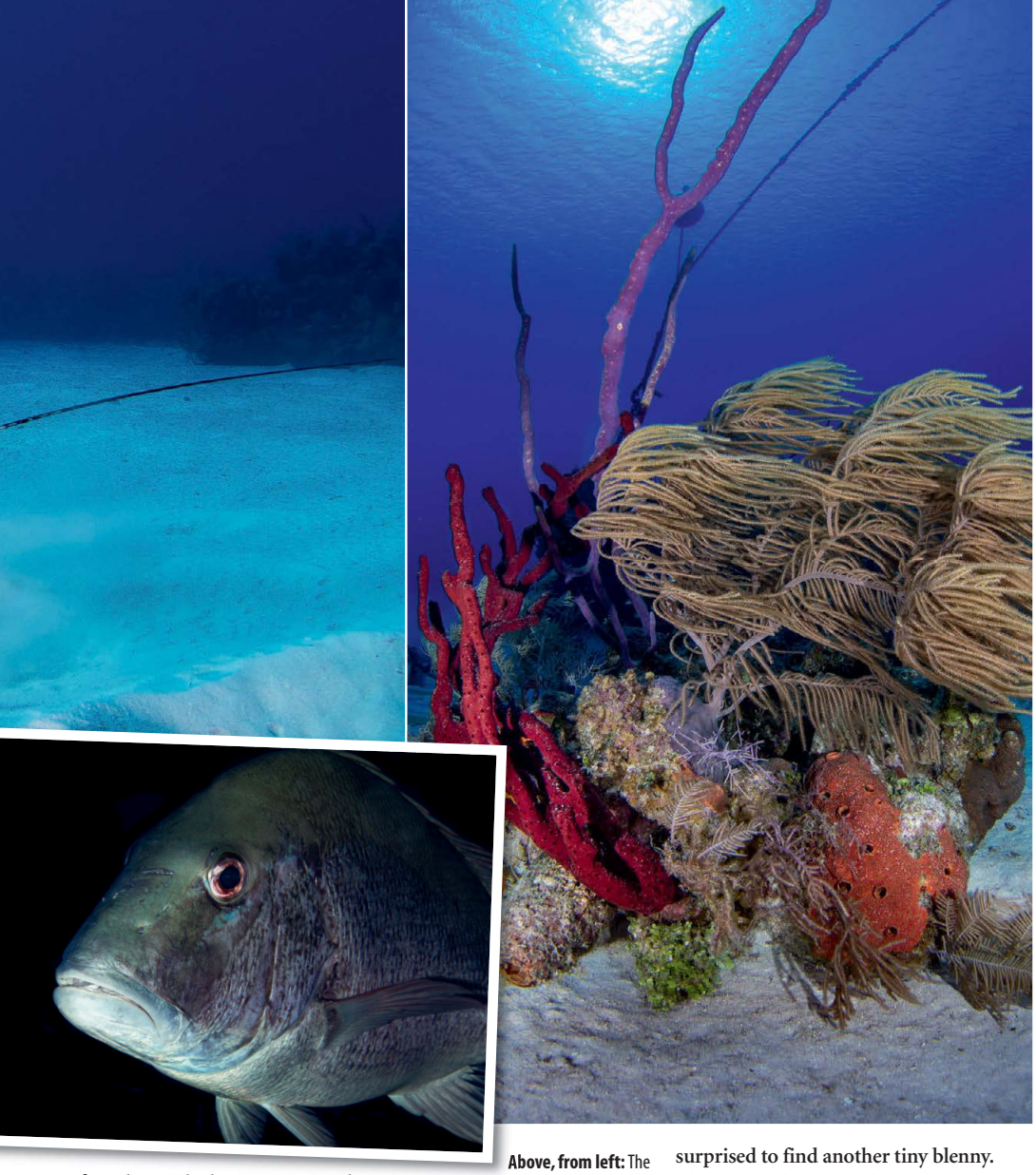
A large school of white fish now populated the bow. I hadn't seen these on previous dives. Foureye butterflyfish followed each other in pairs, pecking at the sponges and coral. Sharknose gobies, normally scarce on the wreck, seemed to be on every piece of hard coral, and even inside the bright yellow tube sponges.

Often a large tiger grouper would be



Above, from left: This spotlight parrotfish seemed pleased to see divers; an eagle ray rooting in the sand for food near the wreck.

Below, from left: There were many more yellowhead jawfish than usual among the rubble; a juvenile hawksbill turtle feeds inside the wreck while a French angelfish picks up any leftovers.



found atop the bow section, and sure enough it took pride of place in the middle of the deck. It let me get very close.

Around the bow I saw two big lionfish, a pest and predator of local species in Caribbean waters. Culls would normally be carried out regularly, but after three months without diving they were present in abundance.

We saw three more inside the hull and several out on the reef.

On the other side of the wreck I spotted an arrow-crab and cleaner shrimp. At 21m at the bottom we had a fair amount of time using nitrox, but at 110 bar we started to head back over the sand.

A GOOD NAVIGATION point to the wreck is a large sand tilefish nest halfway between Amphitrite and the wreck. Tilefish are usually very shy, ducking into their large burrows as you approach, but they seemed unconcerned and allowed me to get very close.

We would previously find a couple of yellow-headed jawfish in the rubble before getting to Amphitrite, but this time saw at least 12. Passing the mermaid, I always look in the sponges growing in the grooves of her hair, and this time was surprised to find another tiny blenny. This one had burrowed into an empty tubeworm.

Above, from left: The ever-friendly dog snapper; seafans sway in the current.

Below, from left: The reef looked healthier than before; there were more sharknose gobies around.

Across the reef and back to the ocean pool at Sunset House, I was amazed by the numbers of fish milling about – different kinds of parrotfish, Bermuda chub and two smooth trunkfish chomped at the algae, while wrasse were busy at cleaning stations. Several big groups of yellow-striped snapper and goatfish were gathered by coral boulders.

A friendly dog snapper, which usually sought me out when I was teaching students under water, came swimming over, keeping its distance a little more than usual but following as we swam around.

Normally there would be one or two corkscrew anemones between the rocks in the hard pan, but we saw many, all with cleaner and snapping shrimp. In one we found a banded clinging crab.

We returned at 6.35, with a queue already building outside the dive-centre. Changing our lenses to wide-angle, we decided to try to get in our second dive before things got crowded.

Luckily for us, every diver had to fill out a new waiver and Covid medical forms, so after 40 minutes we were back in the water, completing our surface interval as we swam back out to the wreck.

DROPPING RIGHT ON TOP, I saw a juvenile hawksbill turtle munching on a sponge inside the open deck, with a French angelfish beside it catching any bits the turtle had missed.

Unbothered by me as I lay at the bottom of the wreck, it swam towards me, over my head and continued to pick juicy morsels off the side of the stern.

After trying to capture the amount of life and colour on the wreck we swam south over several fingers of reef to the big anchor at 16m. Another French angelfish was using it for protection.

Coming up over the reef we saw a group of four divers, then another six, some with lionfish spears.

We had planned to do a third dive, but having seen the queue decided to wait until next morning.

That night I dreamt of dappled sunlight dancing over a white-sand seabed and serene fish swimming among swaying sea-fans. I woke at 5.30 raring to go.

Lee had kindly set aside tanks for our early start. We planned to visit the coral nursery to the north of the site to see how the hard-coral trees had fared.

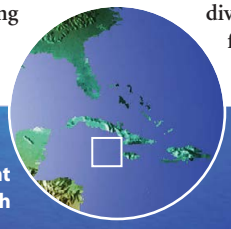
In fact the Coral Reef Research team had been exempted from lockdown early

to check on the nursery. The sprigs of staghorn coral looked bigger, and very healthy.

Moving even further north I saw another juvenile hawksbill, perhaps the same one as the day before, resting beside the reef. It was happy to look at its reflection in my dome-port as I took its photo.

After 88 minutes we ascended. The dive-centre was open, and during our surface interval Lee told us that 120 divers had turned up for the first dive-day after lockdown!

Above, clockwise from top left: Goldface toby; arrow crab; coral nursery tree; the juvenile turtle; this blenny was in an empty tubeworm burrow on the mermaid's 'hair'.



FACTFILE

GETTING THERE ▸▸ Direct flight to Grand Cayman from UK with British Airways.

DIVING & ACCOMMODATION ▸▸ Sunset Divers at Sunset House, sunsethouse.com

WHEN TO GO ▸▸ Year round. June-November is hurricane season, however, though the riskiest months are September and October. Air and water temperatures both range from 26-33°, December being the coldest month and September the hottest. Visibility is normally 20-25m.

MONEY ▸▸ Cayman islands dollar (US $1.25 is fixed to CI $1).

PRICES ▸▸ Return flights from around £600pp. Seven nights' B&B from £800pp (two sharing, November), guided shore dive $70, two-tank boat dive $130.

VISITOR INFORMATION ▸▸ visitcaymanislands.com

Several had reported seeing a 2.5m loggerhead turtle near the wreck the previous afternoon – now we wished we had done that third dive!

For our final dive we decided to go beyond the wreck to its anchor, located in 28m at the edge of the wall.

I took a few photos of the colourful encrusted anchor, and started swimming up the sand channel towards the wreck.

Mateusz, my buddy, had been investigating the reef whilst I shot the anchor, keeping out of my way.

Now he was shaking his rattle, and I looked up to see him pointing towards the sand beside the wreck.

A beautiful eagle ray was snuffling in the sand, looking for food. We followed as it circled the sandy area slowly, dipping into the sand every now and again to feed.

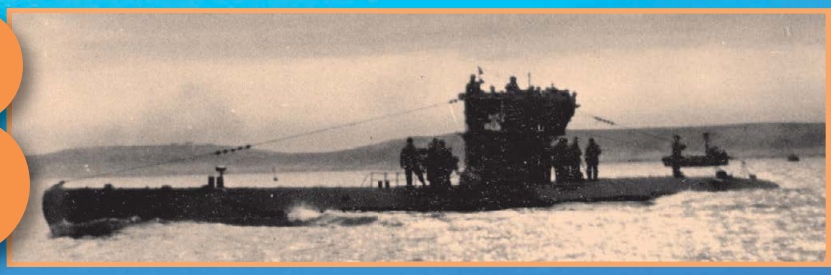
We spent the rest of our 93-minute dive lazily exploring the beauty of the reef and delighting in watching the fish go through their morning routines.

The dog snapper had decided that it was fine with me again, and made me laugh as it started to come within a foot of me, staring through my mask.

This often happened while I was teaching students, and would always make for a funny photo for them.

It felt wonderful to be recognised – and reinforced why I love diving so much.

U-133



U-BOOT MUSEUM CUXHAVEN

It's one of the only Nazi U-boats accessible to divers in Greek waters. DIMITRI GALON (who took the underwater photos) and ROSS J ROBERTSON report. Illustrations from Galon's archive unless otherwise indicated

Pictured: The conning-tower – the observation periscope is visible on the right, and the attack periscope on the left.

Right: Conning-tower from above – the open hatch, the base of the UZO on the left, the lower part of the attack periscope on the right and remnants of the loop antenna and the trawler net can be seen.

IT'S 1986. PROFESSIONAL DIVER Stathis Baramatis begins a long exploratory dive. The bright sapphire colours soon darken into ever-deepening blue hues, his survival depending on a trailing umbilical.

Despite the restricted view from his mask, he is trying to follow a stream of sporadic air bubbles and slowly ascending blobs of thick, dark yellow oil.

Curiosity has brought him and fellow-diver Theophilos Klimis to this spot, after noticing an oil-slick at the surface the previous day.

Their years of experience suggest that they must be coming from a shipwreck.

While junk-bonds and conspicuous lifestyles characterise the yuppie era elsewhere, sponge diving and the occasional commissioned recovery dive are how these two eke out a living.

Scrap-metal riches they might extract from the new find could be considerable.

Thirty-six metres, 45m – Baramatis plummets further. Below the thermocline it's increasingly cold and foreboding.

Visibility is poor as suspended particles whoosh by in the strong current. It's nothing alarming for such a seasoned diver, but he remains prudently respectful of his surroundings as he presses on.

A cigar-shaped form can now be discerned in the eerie gloom, and at a little over 70m he finally reaches the wreck.

Heavily encrusted with barnacles and other marine life, it's frustratingly difficult to determine what he has found. Apart from the poor visibility and gloom, much of the prize is obscured by a recently entangled trawl-net.

As Baramatis will later learn, a trawler had snagged on something at the location a day or two earlier. Despite repeated attempts to break free, the net and tackle had refused to budge.

When blobs of oil appeared at the surface, it was clear that something in the deep had been disturbed. Fearing trouble from the authorities, the fishermen had cut the net and fled.


ARCHIVE OF EFSTATHIOS BARAMATIS

Above: Efstathios Baramatis (*left*) and Theophilos Klimis found the wreck in 1986.

Now Baramatis finds himself gazing at the source of the disturbance. The marine growth tells him that it's metal and sank some time ago, but that's all.

"I was truly mystified," he recalls. "The bow seemed to be missing and there was something like a turret that rose up from the hull, so I went to investigate. Behind it, I was eventually able to make out the barrel of a machine-gun – this was the moment I realised it must be a submarine.

"My heart skipped a beat as my thoughts immediately went to her crew. Submarines rarely sink without them, and it immediately changed my perspective."

After decompression (just over half an hour after 25 minutes beyond 70m – incredibly, such short times were routine for him), Baramatis surfaces and excitedly fills in his old friend. They agree that further investigation is required.

The net proves a problem, but work to remove it on ensuing dives eventually reveals a compass on the conning tower. Encased in brass, it is mounted on a long-since jammed and overgrown gimbal.

While trying to remove the growth and grime from the glass dome, it bursts in a confusion of erupting bubbles.

"Down there, in the silence of the deep... all alone but for your own rhythmic breathing, an unexpected explosion is startling, even terrifying," says Baramatis.

"It took me a few moments to recover and work out just what had happened."

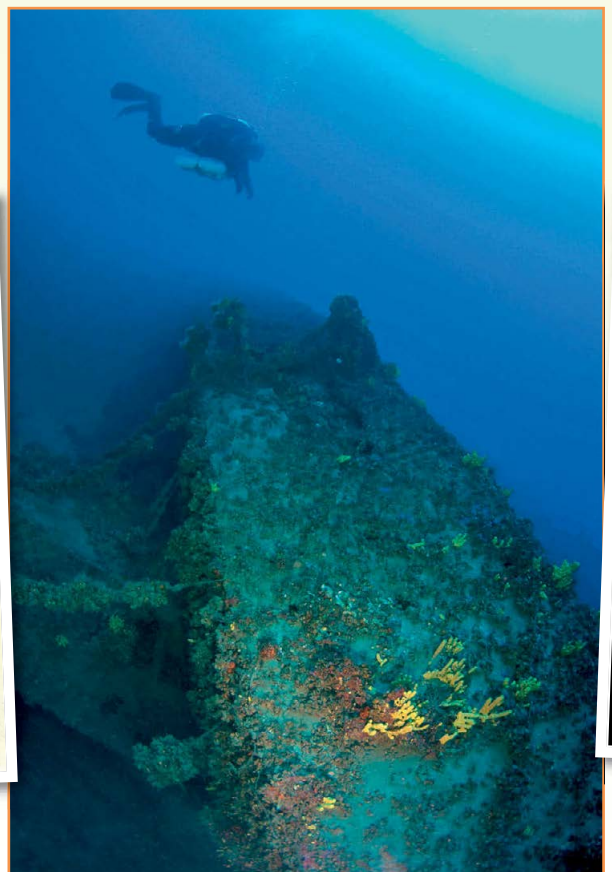
The ordeal soon pays dividends. "Looking at the newly exposed compass dial, I noticed an unmistakable symbol. Emblazoned there as clear as day was a war eagle, its powerful claws clasping a Nazi swastika. I was standing on a WW2 German submarine!"

THE DIVER QUICKLY informs the German embassy in Athens, but it shows little interest. This is unexpected, given that bodies of the U-boat's officers and crew are likely to remain aboard.

Baramatis files a joint recovery application with salvage-company owner Yiannis Panagos, but the Greek authorities reject it. Panagos later lodges a separate request to buy the submarine for scrap, but this also fails. Baramatis is forced to drop the matter and look elsewhere to provide for his family.

The discovery of the virgin U-boat wreck looks to have been buried by indifference and bureaucracy, but in 1991 a newspaper article by journalist C Karagiorgas is published. The U-boat's exact location is not disclosed, but now the technical-diving community

Below from left: Kriegsmarine recruitment poster; over the stern of *U-133* – on the left the detached bow can be seen; the U-Boot-Kriegsabzeichen badge was awarded after two combat patrols.



U-BOOT MUSEUM CUXHAVEN

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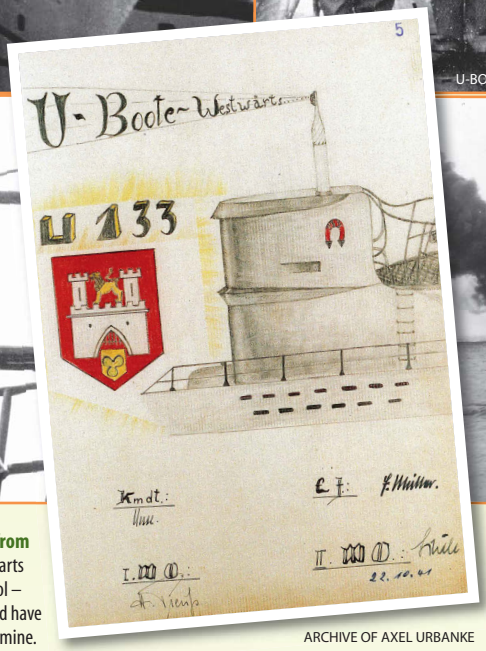
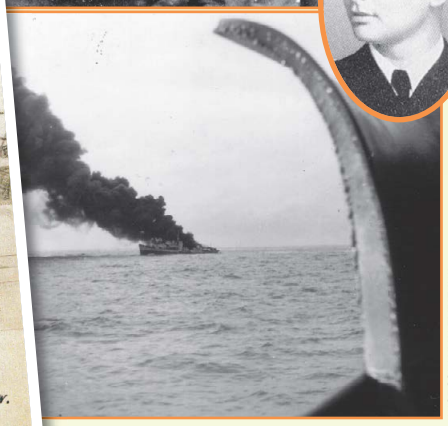


ARCHIVE OF AXEL URBANKE



IMPERIAL WAR MUSEUM

is aware of it. Recreational diving has yet to be deregulated in Greece, so only a hardy few professionals dive local waters at that time, but the allure of a U-boat sees the wreck relocated and several dives undertaken in the mid-1990s. The race to identify the vessel begins in earnest.

It is wreck-hunter Costas Thoctarides who identifies it as *U-133*, a decade after its discovery. Since then more information has come to light, and the complete story can be told.

BRITAIN WAS ALMOST brought to its knees by the havoc U-boat "wolf-packs" wrought on Allied convoys and transatlantic supply routes, but less is known about the crucial role these submarines played for the Germans in the Mediterranean.

A strong British naval presence in the region and the general ineptitude of the Italian navy had severely compromised Axis supply lines from Europe to the Afrika Korps in North Africa.

This threatened General Rommel's push east towards Egypt, his prize access to the Arabian oil fields that lay beyond the Suez Canal. So Hitler ordered six Type VIIc U-boats to run the gauntlet of the British-controlled Straits of Gibraltar in September, 1941.

More followed, and the 23rd and 29th Kriegsmarine Submarine Flotillas were established, the 23rd at a commandeered naval base on the Greek island of Salamis.

Above, clockwise from top left: *U-133* departs on its third war patrol – an hour later it would have sunk after striking a mine. Commander Eberhard Mohr and first officer Harald Preuss can be seen on the conning-tower; former captain Lt-Cdr Hermann Hesse (in the white cap) with other officers at Salamis naval base on *U-133* in January 1942; destroyer HMS *Gurkha II* burns after being torpedoed by *U-133* off Egypt a few days earlier; entry in the 7th Submarine Flotilla's visitor's book on 22 October, 1941, the day it was sent on its first war patrol during the Battle of the Atlantic; *U-133*'s 20mm Flak 30 anti-aircraft gun.

Oval insets, from left: Lt Hesse was captain of *U-133* from 5 July 1941 to 1 March, 1942; when he was replaced by the less experienced Lt Mohr.

Right: A kicking donkey, mascot of the 23rd Submarine Flotilla.

The U-boats were soon disrupting Allied supply-lines from Alexandria and Port Said to the British and Commonwealth forces in besieged Tobruk, and one of them was *U-133*.

The U-boat had been redirected from the Atlantic at the start of its second war patrol and, despite being seen and chased down, Lt-Cdr Hermann Hesse made it through the British picket at Gibraltar on the night of 21 December, 1941.

Laid up for a time in Messina, Italy, by propshaft problems, *U-133* was in its designated hunting ground off Egypt on 17 January, 1942, when its hydrophone picked up an Allied convoy heading from Alexandria to the besieged island of Malta.

Hesse fired a full salvo of torpedoes at one of two destroyer escorts, sinking the British destroyer HMS *Gurkha*.

Miraculously, a second destroyer managed to save all but nine of the crew.

U-133 finished its patrol at Salamis and was incorporated into the 23rd Flotilla. Hess relinquished his captaincy, and the mascot of a kicking donkey – referring to the island's large wild donkey population – was painted onto the conning tower.

ARCHIVE OF GEORG HOEGEL

Command of *U-133* was given to Lt Eberhard Mohr, 26, even though he had no combat experience. The submarine set off on its third war patrol just before dusk on 14 March and, within an hour, would be lost with all hands.

The event was witnessed by look-outs of the Kriegsmarine 603rd Coastal Artillery at Cape Tourlos on the island of Aegina and dispassionately recorded in their war diary: "*18:55 hrs: The lookout at Tourlos reports a vessel heading south. It is identified as a submarine. 18:57 hrs: A flash and eruption of water, an explosion is heard immediately afterwards. The submarine has disappeared.*"

What caused such sudden destruction? To safeguard strategic areas including Athens and Piraeus, the Royal Hellenic Navy had laid minefields in the Saronic Gulf days after the Italians declared war on Greece on 28 October, 1940.

The largest was between Cape Tourlos and the islet of Phleves just off the mainland. It created a formidable east-west barrier across the Gulf, though it failed to stave off Germany's war machine.

After Greece was occupied in April, 1941, the minefields were incorporated into Axis defence plans, but

proved problematic. Mines would shift or even detach from their moorings and wash up on the beach, or drift at the surface, endangering all concerned.

On 29 March, 1941, just days before the Germans arrived, the Royal Hellenic Navy salvage tugboat *MIMIS* fell prey to the mines with the loss of 23 men, as did a hapless Greek caique on 18 January, 1942.

CONFIRMING THAT *U-133* had suffered the same fate required the help of the Italian Navy. Submarines were highly valued weapons, and any chance of retrieval had to be investigated.

Lt Enzo Biagi descended in a diving bell on 4 April, 1942, and reported extensive damage by an explosion consistent with that of a shipping mine. *U-133* was beyond recovery.

Although newly arrived in Greece, Lt Mohr must have known about the quirky minefield, so was blamed for wandering into the hazardous area.

However "it's only when things go horribly wrong that they start handing out medals," as they say in military circles, and Lt Mohr was posthumously promoted to Lt-Commander soon afterwards.

Deeper investigation into Attica's German Naval Defence Administration records has since revealed that 12 days before the demise of *U-133*, a cargo ship had inadvertently hit a buoy off Cape Tourlos, destroying the signalling lamp that indicated safe passage through the minefield. However, it was not replaced for six days, and then only with a simple surface marker.

Given that the sun had set 40 minutes before the disaster, and it was two nights before the next new moon, it seems that Lt Mohr and/or his look-out simply failed to see this marker in the dark.

They paid for this understandable omission with their lives.

A little earlier the same day, reports of an Allied submarine in the Saronic Gulf had prompted the Germans to send two coastal patrol vessels to the area.

They had been waiting for *U-133* 1.5 nautical miles away on the other side of the minefield, intending to safeguard the submarine's passage out of the Gulf and into the wider Aegean. So had there been any survivors after the disaster, they could have been rescued in minutes.

U-133 is a designated war grave so has not been promoted as a diving location. In any case, it lies nearly two nautical miles off Cape Tourlos at 70m-plus in an area known for currents, so is a serious dive.

Above: The timber deck has disintegrated, leaving large gaps in the metal construction. Marine growth has created a colourful shroud around the iron coffin.

Below: Over time oxidation has created gaps in the casing, revealing the metal supports between it and the pressure hull.

FOR ANYONE LUCKY enough to experience this time-capsule for themselves, the conning-tower is an obvious starting point.

The air observation and attack periscopes, both lowered in their protective sheaths, can be clearly seen on approach. They are not vertical, which accentuates that the submarine is resting port side-down at an angle of about 30°.

Hovering above the conning tower, the base of the UZO (U-Boot-Zielobjektiv) is still distinguishable, despite thick encrustation. Special binoculars with night-vision capability mounted on the UZO were, like both periscopes, linked to an onboard electro-mechanical torpedo data computer manufactured by Siemens.

This worked out solutions for the firing control system and was cutting-edge in its day. Type VIIc U-boats also had radio direction-finding capability, and the scant remnants of the loop aerial base can be seen.

The compass is missing from its encrusted gimbal – it was removed by Baramatis in 1986 as proof of discovery. The hatch on the conning-tower deck is open, confirming that *U-133* had been at the surface when disaster struck.

Moving aft of the conning-tower, the "Wintergarten" area is barely discernible. This is where the 20mm Flak 30 anti-aircraft gun was located.

However, the railings have corroded away and only the encrusted mounting remains. Sadly, the gun itself seems to have been pilfered by some unscrupulous diver.

In front of the conning-tower is the 88mm deck-gun, covered with a large piece of that trawl-net that snagged it in 1986. Now one continuous mass of marine life, the gun is barely distinguishable.

Along the hull the wooden decking has long since disintegrated, leaving big gaps through which the space between the casing and pressure hull is visible and fish dart about.

Forward of the deck-gun, the entire bow section – about a quarter of the submarine's 67m length – is missing. The mine struck under the forward torpedo-room, which was also the crew's quarters.

Bottom, from left: The AA gun was located here – U-boat crews referred to this area directly behind the conning- tower as the 'Wintergarten'. Only the gun's base remains; the 88mm deck-gun, forward of the conning tower, is covered by an overgrown trawl-net.

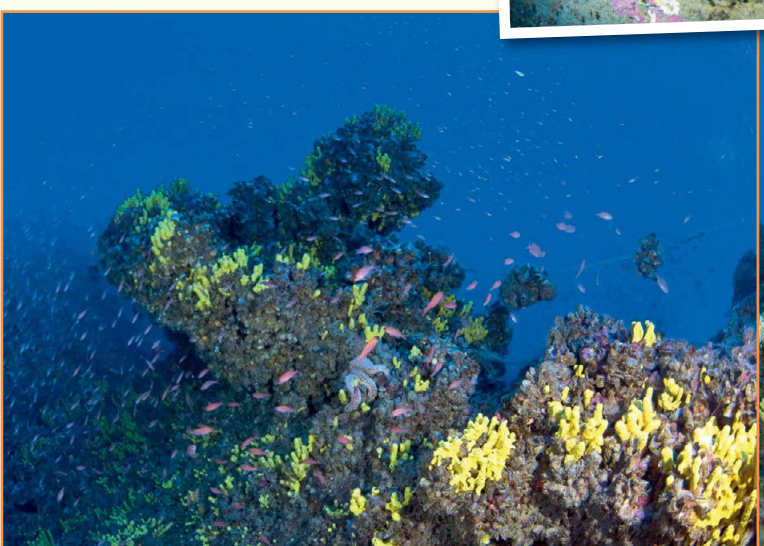
WATER BEING SUCH a dense, incompressible medium, the main force of the blast had been directed upwards and onto the hull, blowing the front of the submarine off and leaving a cross-sectional hull breach.

However, the twisted metal and marine growth rule out any misguided notion of wreck-penetration.

Swimming back down to the stern reveals both three-bladed propellers, the port one resting on the seabed. The course rudders, vertical support shaft and rear hydroplanes are also distinguishable, although thickly overgrown.

But an unexpected surprise is that beneath all this, and perpendicular to the main body of the submarine, is the missing bow section.

Following the explosion, the detached bow had settled on the seabed shortly ☛



before being followed by the rest of the submarine. Perversely, the stern came to rest on top of it.

Closer inspection of the starboard side of the bow section (the port side being partially buried in sand) reveals that torpedo-tubes one and three are closed.

U-133 had just been embarking on a war patrol, so would have been fully laden with fuel, food and munitions.

Fourteen torpedoes must have been on board, none of them loaded into the bow tubes because the submarine had been cruising in friendly waters. Most were stored precisely where the mine struck.

Whether or not these contributed to the powerful explosion will never be known. Type VIIc boats also had an aft torpedo-tube that could be loaded externally only at the surface. A single torpedo loaded in 1942 probably remains there.

VARIOUS OBJECTS are scattered on the sandy seabed around the site. Most notable is a torpedo-like compressed-air cylinder in front of the breach. This had been located directly above the forward torpedo-room and living quarters, but became separated in the explosion.

One of the anchors can be found near the stern, but most other objects have been rendered indistinguishable by the force of the explosion or marine encrustation and corrosion.

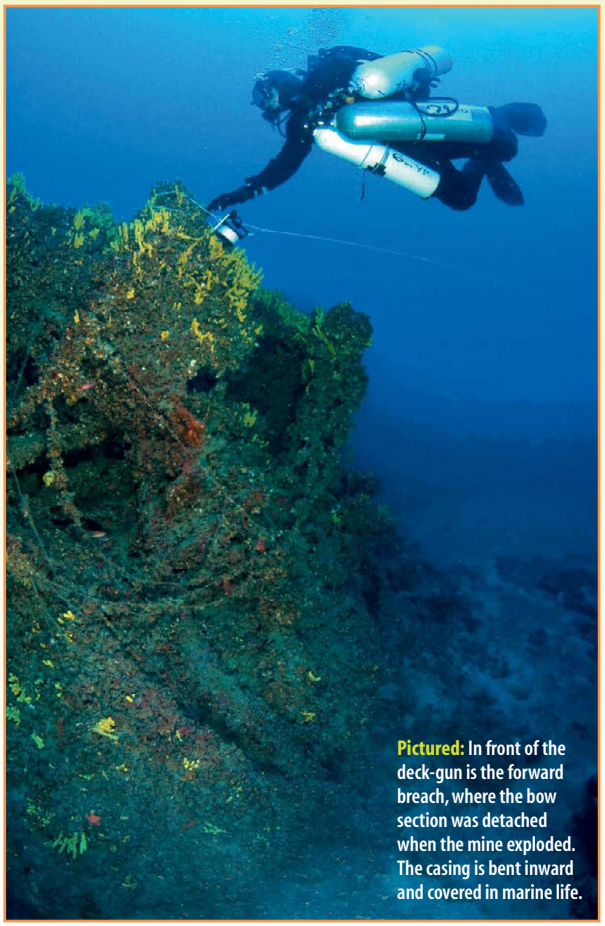
This war-grave is protected by law. Special permission was required to dive it until June when this was rescinded, but no dive-centre in the area facilitates access.

U-boats might have had the upper-hand in the first years of the war but the eventual losses were staggering. Of the 65 sent into the Mediterranean, none survived. To serve on a Kriegsmarine U-boat in any theatre of war was a virtual death sentence. Of the 40,000 men who enlisted or were recruited, 30,000 were lost. Of the 863 U-boats sent on war patrol, 784 met a catastrophic end.

There are five other U-boat wrecks in Greek waters but *U-133* is the only one accessible to divers, and the only one unequivocally identified. It is a rare and important artefact because it embodies events that took place in Greece and the wider Mediterranean in WW2, but it is more than an object of historical interest because it also entombs its young crew.

Seventy-eight years later, the wreck is a reminder of the needless bloodshed caused by promoting intolerance and manipulating beliefs.

As such, it's a dive far deeper than anyone who makes it expects.



Pictured: In front of the deck-gun is the forward breach, where the bow section was detached when the mine exploded. The casing is bent inward and covered in marine life.

PEREGRINE

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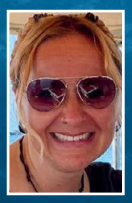
FIT FOR FOUR KINGS



Raja Ampat is Indonesian for the Four Kings, and it's on many a diver's bucket-list. If you're not sure why, let CATH BATES explain…

RAJA AMPAT LIES in the most easterly province of Indonesia known as West Papua. It is sandwiched between the Indian and Pacific Oceans, where deep sea currents funnel through a 1500-island archipelago.

The "Four Kings" are Waigeo, Batanta, Salawati and Misool. These marine protected areas and no-take zones lie in nutrient-rich waters in the Coral Triangle. Liveaboards run either a seven-night north and central itinerary or a longer 10-day one (including Misool in the south).

Following an effortless 90-minute ferry ride from Sorong to the capital Waisai, I boarded the *Emperor Raja Laut*, a 31m schooner-style yacht that accommodates just 12 guests.

That same afternoon I was diving the island of Mansuar at Yenbuba Jetty. You know you're in for a treat when a check-dive provides the biggest table-coral you've ever seen and three blacktip reef sharks by the fourth minute! Staghorn and cabbage corals as far as the eye could see sheltered small pink anthias.

The early-evening light beamed down on fans and pink broccoli corals adorning the wooden jetty pillars.

Following an early breakfast we were entering the channel on day two at Citrus Ridge in southern Gam. Named after the soft yellow- and pastel-coloured broccoli corals gracing the underwater boulders, the clear water here is occupied by schooling bigeye jack and barracuda.

In the shallows spadefish move in harmony with the red and pink seafans in the gentle surge.

AFTER OUR PROPER divers' breakfast of bacon and eggs I was ready for Mayhem! Along the western edge of the Dampier Strait, this large pinnacle is home to schooling fusiliers, great barracuda and surgeonfish.

They all teeter at the edge of the reef in an attempt to evade the upwelling current, and the sheer variety of fish and corals give this site its name.

I passed tall barrel sponges, huge brain and porites corals, low mushroom and staghorn corals and a random whip-coral garden.

The weird faces of barramundi, marbled grouper and bumphead parrotfish contrasted with the regular beauty of unicornfish and sweetlips.

A wobbegong shark tried to evade us by sitting motionless on top of a green table coral. It thought twice about its inconspicuous camouflage and was soon gone with the flick of a tail and blink of a strobe.

The Fam Islands cluster in

notoriously calm waters north-west of Batanta. Melissa's Garden was named after local diving guru Max Ammer's daughter.

It's an oval reef on a plateau between three islands, starts around 12m and slopes down to a 25m sandy bottom.

The delicate rolling staghorn coral was home to the most critters I had yet seen in Raja Ampat.

Pughead pipefish hid within an anemone, two mirroring ribbon eels bobbed up and down gasping and yellow damselfish moved like a symphony among the coral branches.

A trail of fusiliers swam quickly by, hunted by hungry giant trevally. I found myself sobbing with joy at the beauty of what was being played out before me.

To recover from this thrilling afternoon at Fam we hiked up the wooden staircase to Piaynemo viewpoint. Before the sun had started to go down behind the lagoon we took panoramic shots of these unusual islands and the Halmahera Sea beyond them.

The turquoise colour of the lagoon was breathtaking. While up there I saw my first Raja turtle, as it popped up for air amid the plankton, coral and limestone peaks.

After a 55-mile overnight sail we arrived at Wayag in north Raja Ampat. Sadly we were unable to dive the famous Cathedral Rock.

Swell from the Philippines slammed dangerously against the rocks and our cruise director chose a more sheltered plateau called Channel.

I was a little underwhelmed after the excitement of the Cathedral Rock briefing but in Raja Ampat there is always something to astound you: here it was the volume of glassfish pinnacles and giant clams in the shallows, big enough for Aquaman to lie in!

We geared back up after breakfast for Pelagic Rock. It lacked any notorious shark-like pelagics but we circled the underwater pinnacle enjoying jack, grouper, barracuda, batfish and a merry-go-round of fusiliers swimming for their little blue lives!

An afternoon excursion saw the more adventurous in the group climb the Wayag steep cliff for 360° views. The rest of us enjoyed a nice skiff ride, winding through a fairy-tale landscape of rocky green outcrops. The water was very inviting until we began discussing the possibility of saltwater crocs!

THE NEXT DAY THE excitement on board was infectious. Sailing back through the Equator, we counted down the co-ordinates at the rear until the GPS hit 00:00.

I have since been informed that this is how pirates rack up multiple earrings!

Coupled with six blacktips circling the stern, the vibe was a happy one.

Y Reef on Bag Island was teeming with sergeant-majors, wrasse, butterflyfish and damselfish in their hundreds.

Soft polyp and broccoli corals squeezed their way to occupy whatever space they could between mosaic and table corals.

Next we dived the unusual topography of Two Slots – a tropical Silfra! Two huge underwater boulders have a canyon running between them from 7m down to the sea floor at 25m.

The surge brings food and attracts yellow-tailed surgeonfish schooling in the top bowl, while fusiliers dart about in an attempt to stay together deeper.

We descended north of the Equator at the Maze and ascended south of it. It felt like diving a giant mushroom forest!

Topside the birds squawked in their grassy nests in the heat of the sun.

In contrast, beneath the islands, Mother Nature slammed her angry waves against the increasingly worn stalks.

WE ENDED THE DAY with a dive at the Pearl Farm jetty. Strict instructions were given about where we could and couldn't ascend; preferably not into the barrel of an angry pearl-farmer's rifle!

This is big business in Raja Ampat but the severely strong current didn't calm our paranoid nerves as we finned frantically away from the off-limits area.

The surreal macro nightlife didn't disappoint, but it was hard to photograph before I was flung into my poor waiting buddy. Seven thousand dives can't prepare you for Raja Ampat in the full-moon rush hour!

A netted ceratosoma glowed like a peacock in the light of my torch. It stood out like (and not much bigger than) a sore thumb; decorator crabs frantically threw debris onto their bodies and scurried past us, while a tiny painted frogfish balanced precariously sideways in the current on one webbed foot.

The holy grail – a pinnate spadefish – teased me with its glowing orange outline, but wouldn't emerge from the safety of its rock shelter. Some of the other divers were lucky enough to see a "walking" epaulette shark.

As with much of the underwater

Above: *Emperor Raja Laut.*

Left: Manta ray at Manta Ridge.

Below left: Diver under Yenbuba Jetty.

Below: A pair of pink skunk clownfish.

Bottom: Panoramic view of Piaynemo.

landscape in the north there are cracks and swim-throughs to explore.

However, the current against the west side of Kawe Island picked us up and threw us right into the action of Changgo (*aka* "Do It Again").

Schooling grunts and sweetlips hung motionless, mocking us as we were unable to stop, and the tornado of bigeye trevally swirled further and further away from my lens.

In contrast, second dive Eagle Rock is a huge plateau with a rubbly bottom in front of three islands.

We swam out to the outer edges in the hope of spying a manta ray on a cleaning station.

It was a serious case of "it's behind you" as we heard metal on metal alerting us to two *Manta alfredi* flying low, closer to the central rock itself.

I was torn between photographing these beauties and the huge bumphead tearing algae from the rubble among a school of yellow-lined snapper.

The current soon decided for me. We were whipped away from the action and around the other side of the rock to a blacktip reef shark doing the conga with giant trevally and fusiliers.

My Welsh dive-buddy was convinced that the solidified lava of Black Rock was shaped like a dragon. This dive on the north-west side was like a jigsaw puzzle.

One hard-coral species grew in the gaps that other coral species left: in harmony with each other in terms of form and detail, and yet higgledy-piggledy random at the same time!

We watched batfish tuck in close to the bottom enjoying a spa day at the wrasse cleaning station, and great barracuda unsuccessfully play hide-and-seek with tufts of bright pink broccoli coral. As if to really throw a spanner into the mix, both black hard and soft corals sprang up in defiance of all the rainbow gloss around us.

Above, clockwise from top left: Pontoh's pygmy seahorse at Cape Kri; bigeye jack at Arborek Jetty; broadclub cuttlefish.

Below, from left: Corals and anemones at Melissa's Garden, yellow-lined snapper at Eagle Rock.

BY DAY SIX we had landed back in the Dampier Strait between Gam and Mansuar. Unfortunately, so had many other liveaboards, and we dutifully allowed the earlier arrivals to have their turn first at Manta Ridge.

Just as we had donned our gear for our slot, some naughty late arrivals whizzed past in their two skiffs. This meant that the site was packed.

I was sad to see this kind of behaviour in one of the most pristine and protected areas I had ever dived, but I guess there are rule-breakers everywhere.

We waited as long as we could, schedule and falling tide times permitting. Thankfully, halfway through our dive the other groups dispersed.

Guidelines are strict at Manta Ridge. You are requested to stay off the cleaning stations and go no shallower than 10-12m. This allows the cleaning behaviour for the mantas – albeit victims of voyeurism – to be undisturbed.

Despite their size, these mantas were not *birostris*. I had never seen such massive reef mantas in all my years of diving. There were just two or three of these 5m monsters in the first half of the dive. As spectators reduced we were lucky enough to have six playing together, blocking out the sun above us.

We were not so lucky at Manta Sandy, but a late-afternoon dive at Arborek Jetty was a treat. An active school of bigeye trevally weaved in and out of the wooden jetty stilts. Their scales shimmered in the light of the low sunbeams, and they sometimes created a vortex moving up and down the jetty slope, offering a multitude of different poses.

Batfish finned gently against a backdrop of soft broccoli and fan corals, and purple anthias stood out against the darker shadows of pinnacles. Glassfish swirled around them playing cat and dog with incoming jack. It was another highly decorative dive-site before beer o clock!

Our final day provided a great crescendo to a satisfying week. Sardine Reef actually has none of its namesake

Above, clockwise from top left: Tassled wobbegong shark; tiger shrimp; fan coral at Mayhem; Yenbuba Jetty.

but is called this because of its sheer volume of fish. On this rectangular offshore submerged reef, you're dropped where the current splits among curious black- and whitetip reef sharks, great barracuda and black snapper.

It was like watching a game of cat and mouse, as they would anticipate the small fry and when to strike the baitballs.

Following a gentle drift up to 10m, we hit the counter-current and hooked on to watch the action at the soft-coral garden.

BLUE MAGIC HAS water as blue as blue can be, particularly in July and August. Its oval shape again provides a splitting current and a plateau at 25m. Because of the full moon, it was all happening that day!

Grey reef sharks sped by, eyeing up schools of Spanish mackerel while yellowtail barracuda and bigeye trevally jostled for space, their noses pointing into the current. The slope was so very pretty, and we slowly shallowed-up, hoping for an oceanic manta at the cleaning station.

They were absent, however, probably because the cleanerfish would have been unable to maintain position in the fierce unsheltered space above the reef. We admitted defeat, taking our safety stop in the blue.

Cape Kri has the largest biodiversity of species of fish recorded anywhere in Raja Ampat. During a single dive, marine scientist Dr Gerry Allen counted 374 at the north-east point of Kri Island.

This wall-dive hosts the 75-plus sweetlips that school at around 35m and have been made famous by those Raja Ampat photographs.

Current rises from the depths and over the ridge, creating a whirlpool that feeds the incredible fauna that live there.

Marine life we saw was very much of the bulky kind and Cape Kri had three of the largest black sweetlips I had ever gazed upon. Turtles had been sparse on this trip, but now three graced us with their presence in just five minutes.

Rabbitfish, jack, two kinds of reef shark, seven kinds of sweetlips, moorish idols, angelfish of varying types, surgeonfish… I could go on and on.

Our guide Donny even found a Pontoh's pygmy seahorse holding on for dear life to the most delicate piece of flotsam among the chaos!

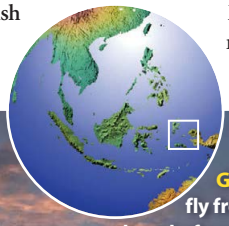
Each night at dinner, our cruise director Flo would provide a rundown of the day and what to expect on the next.

That night's final reflection was an emotional one, an observation from a guest on a previous charter.

It surmised that Raja Ampat is full of diversity – its fish, corals, topography, terrestrial landscape as well as its people.

The underwater world is all about life, and where there's life there's beauty. But how can you explain how it makes you feel to be under water there? You can only describe what you've seen.

This incredible part of the world certainly left me speechless.



FACTFILE

GETTING THERE ›› Airlines such as Emirates and Qatar fly from the UK to Jakarta. Book an overnight/day room there before continuing to Sorong with a domestic carrier, or overnight in Sorong before boarding the liveaboard. Garuda allows an extra 5kg of diving equipment or buy excess baggage locally or in advance. A ferry ticket from Sorong to Waisai is included in liveaboard price.

DIVING & ACCOMMODATION ›› *Emperor Raja Laut*, emperorindonesia.com

WHEN TO GO ›› The season runs from late November to April, though there are occasional off-season charters when it's quieter.

MONEY ›› Indonesian rupiah, but US dollars, sterling and euros are accepted. Credit cards attract a 3% premium onboard.

PRICES ›› Return flights to Jakarta from around £550. Onward return flights from £375. Overnight hotel with breakfast £50. Seven-night liveaboard from £2175 or nine nights (including the south) from £3024.

VISITOR INFORMATION ›› indonesia.travel

BE THE CHAMP!

Who can resist a good blenny portrait? In the tompot especially, UK divers have a little star right on the doorstep. ALEX MUSTARD heads down to Dorset to dive a shallow site with an enduring appeal

*'This 2020 **lockdown summer,** the attractions beneath **Swanage Pier** have been **as popular as ever'***

AHHH, SUMMER, long days, blue skies and warm calm seas. Down in Dorset an underwater photographer checks the tides and weather, primes his camera and is excited by the prospect of capturing something fresh for his portfolio.

But this is no ordinary shoot; he is about to make a truly ground-breaking photograph. The year isn't 2020, but summer 1856 and our photographer is William Thompson. He is about to take Dorset's and the world's first underwater photo.

Underwater photography's William Webb Ellis not only trailblazed our hobby; he inadvertently kickstarted a tradition of British photographers migrating in summer to the south coast.

However, a century after WT, creating clear, bright photos in British conditions was still beyond the capabilities of the off-the-shelf camera systems of the day.

Modern shooters imagine for a moment how you might fare without a wide-angle lens, a close-up lens or electronic flash.

The early members of the British Society of Underwater Photographers were united in solving these problems, inventing and refining equipment and techniques.

Dorset, specifically Swanage Pier, in the 1960s and '70s was their laboratory, where the likes of Peter Scoones, Colin Doeg, Tim Glover *et al* invariably trialled and polished their innovations.

Normal (non-photographer) divers struggle to classify Swanage Pier as a proper dive, because you'd need to take a shovel to find water deep enough to safety-stop, but for photographers it can be heaven – warm, shallow, protected and packed with subjects.

Choosing this style of dive over deeper, more challenging and thrilling experiences is a rite of passage that confirms that you've crossed the line from diver to shooter.

Martin Edge talks about how his buddies thought he was mad to turn down boat-dives in favour of the pier, and in a 1988 article concluded that it was simply "perfect for underwater photography".

He challenged readers to name a better spot in the UK and, to this day, I doubt whether he'd get many arguments from British shooters. This 2020 lockdown summer, the attractions beneath Swanage Pier have been as popular as ever with photographers.

SWANAGE PIER in summer is bathed in warm water (over 18-19°C) and the very shallow depths sees many diving in wetsuits, even 5mms, so even if you never dive in the UK this is a site where you will feel at home as long you have a decent suit and hood (think Canaries, Med or winter/spring Red Sea). Access is very easy, and paying to park and dive helps to maintain the structure.

Summer also means that all around our coasts marine life invades the warm, calm shallow water and the pier, like other shallow spots, comes alive.

Most life loves the shady spaces beneath the legs and the pylons make navigation easy, even when visibility is challenging.

When the water is clear, there is great wide-angle to be had, with shafts of sunlight dancing through the pier legs.

However, most of the popular subjects demand a macro lens, including nudibranchs, Leach's spider crabs, snakelocks shrimps, dragonets, flatfish, gobies, corkwing and ballan wrasse, and the enduring stars of the show, blennies.

Characterful and comical tompot blennies are the A-listers, but the ensemble cast includes black-faced and Montague's blennies and shannies.

Of course, Swanage isn't the only place to photograph tompots in British waters; the UK is at the northern end of the range of this species, and it is found all along our south and west coasts.

But there is nowhere more reliable or easier to shoot these colourful personalities than Swanage Pier.

TOMPOTS ARE the archetypal cheeky chappie and it is this character that we want to highlight in our pictures. Eye contact, as always, is critical and this doesn't mean just being able to see the eye, but to show it to

STARTER TIP

Tompots are always up to something, and with so many beneath Swanage Pier it's common to catch behaviours, especially territorial displays and even fights. In early summer many males will be guarding clutches of eggs, laid by their mates in old pipes and under ledges.

Take a torch to check for eggs and include them in your framing to add an additional story to your pictures.

Left: Shallow depth of field will isolate the character from the background.

Taken with a Nikon D850 and 105mm. Subal housing. 2 x Retra flashes. 1/20th @ f/10. ISO 160.

Right: Swanage's tompot blennies are classic subjects for British underwater photographers.

Taken with a Nikon D850 and 60mm. Subal housing. Retra strobe with LSD snoot. Double exposure.

help the viewer connect with the subject. Blennies typically live on the seabed, so step one is getting as low as possible, without stirring up any silt and messing up both the visibility and our pictures.

We can further highlight character in fish by finding an angle that composes their features in the same structure as a human face, emphasising the eye or eyes above a nose, above a mouth.

Tompots allow audiences to further anthropomorphise with their fancy red hairdo (or *cirri*) and goofy expressions.

Highlighting the facial features allows the viewer to look past a scaly, slimy fish and see an individual.

It allows them to project emotions or personality (cute, surprised, curious etc) onto the subject and means that the image goes beyond being a picture of a fish and becomes a portrait of an individual with which they can connect.

We can help the face to speak even more clearly by de-emphasising any distracting elements in the frame.

We should try to find a camera angle that frames the blenny against an open-water or distant backdrop.

This isn't always easy with benthic blennies, so we often have to use photographic techniques to achieve our subject isolation.

Snoots are an increasingly popular solution, allowing us to put a spotlight on the star of the show. However, quite a few photographers have recently discovered that they are rather trickier to use when you don't have an Asian dive-guide to aim it for you!

THE FIRST TRICK is to always position the snoot in line with the lens barrel – so that finding the spotlight is simply a backwards and forwards challenge, rather than three-dimensional.

Next, don't try to set up on the subject. Instead, find an appropriately sized pebble, fix your focus and only then adjust the snoot. Once it is set up, tighten your strobe-arm clamps and find a blenny, knowing that if the face is in focus it will also be in the spotlight.

MID-WATER TIP

Intertidal blennies, like shannies, are far more active and approachable at high tide, when the best feeding areas are submerged and they are out and about plucking barnacles to eat.

At low tide they might not even be under water for us to shoot, because shannies can live happily in the damp, seaweed-filled cervices in the walls above the waterline.

Above: Shannies are well-camouflaged, so a low camera angle will help them stand out.

Taken with a Nikon D850 and Nikon 105m with FIT +5. Subal housing. 2 x Retra strobes. 1/250th @ f/11, ISO 80.

I used a snoot for the main image in this feature, combining it with a double exposure taken with my macro lens of the sunbeams spearing down through the pier.

The other solution is less taxing technically, and that is to use narrow depth of field to make the face pop out from the background.

The first step for these shots is to get close, because the bigger the subject is in the frame the more blurred the background becomes. Then we need to open up our aperture a bit to reduce depth of field.

I tend to open the aperture a few clicks and then lower the ISO by the same amount at the same time, which saves me having to change my flash powers.

However, like all blennies, tompots have their eyes on the sides of the heads, they can swivel them independently and rarely seem to have both pointing in the same direction at any time.

Two-eye contact can look fabulous, but most shots of tompots with two eyes visible tend to be ruined by at least one of the eyes looking somewhere else completely. Remember, one good eye will give much more appealing eye contact than two eyes not connecting.

ADVANCED TIP

Tompots have their eyes set quite far back on their heads, and if we autofocus on their snout their eyes won't be pin-sharp, assuming that we're filling the frame!

Use thumb/back-button focus so that you can rock the camera forward a few millimetres after focusing to ensure that the front of the eyes are the exact point of focus.

FINALLY, BEAR IN MIND that there is much more to Swanage than tompots, even among the blennies.

High water is the prime time to catch the intertidal shannies and Montague's blennies, which you can find very shallow on the upper parts of the pier pylons, but more reliably close to cracks in the wall.

Shannies are more characterful, especially the males with the white flashes on their lips. Montague's are smaller and prettier, with their fancy quiffed crest.

Both species blend in well with the barnacle-encrusted rocks they inhabit, and the big challenge is finding a camera angle that isolates them against a clean background.

It's well worth a jaunt down to Swanage Pier in summer for great subjects, photo-focused diving and, on any day of the week with a good forecast, for the chance to run into other photographers.

Having seen so few people for months, I've enjoyed such opportune social-distanced socialising.

THE WILD WEST

It's the richness of life and the number of endemic species that draw NIGEL MARSH to sites off the cities of Perth and Bunbury

FROM ONLY A FEW FEET AWAY it looked like a sponge – just like all the other orange sponges I had seen on this rocky reef. But there was something about this one that caught my eye.

I moved in for a better look and, after studying it for several seconds, thought "no, it's just a sponge". I was about to swim off, but something compelled me to have another look.

I scrutinised the sponge and thought I could make out an eye, but I still wasn't sure, because the nearby sponges also had eye-like spots.

I then noticed something out-of-place, a very fine head-lure with a tiny ball of bait at the end. This was no sponge but a frogfish, and a very rare species, the Glauert's, (*Allenichthys glauerti*), found only in this area.

I was diving the temperate waters of south-west Australia, and this strange frogfish was not the only unique species I would encounter in this wonderful part of the world.

Western Australia is a vast destination to explore. The state covers an area of 965,000 square miles and has a coastline of some 8000 miles, spanning from the tropics to its cooler temperate waters.

Wonderful dive destinations include famed Ningaloo Reef, Rowley Shoals and Christmas Island, and while these tropical destinations offer fabulous diving, the state's temperate waters are fascinating for their many endemic species.

It was the prospect of these unique species that recently lured me and good mate Stuart Ireland to spend a week diving the south-west corner of the state, concentrating on the two largest cities, Perth and Bunbury.

Perth, the world's most isolated state capital, is also one of the prettiest cities in Australia, sitting on the banks of the winding Swan River and renowned for its beautiful beaches.

But for the diver the city has countless shore and boat diving options around rocky headlands, jetties and many offshore reefs and islands. We headed south to dive some of the jetties in Cockburn Sound.

This large bay starts at the mouth of the Swan River off Fremantle and extends south to Rockingham. Protected to the west by Garden Island, it offers dozens of sheltered dive sites, many best described as muck-sites.

IT WAS HARD TO MISS our first site because the Kwinana Grain Terminal Jetty is huge, around 300m long. We parked in the convenient car park beside the jetty, geared up and trudged across a beautiful white sandy beach and into the calm clear waters of the Indian Ocean.

I quickly found one of those local species, a sea cucumber. Most sea cucumbers are not very exciting and easily overlooked, but this one was a pretty pink and feeding, its bushy arms collecting food and funnelling it into its mouth.

I shot numerous photos of it and then looked up to see dozens more all around me, most of them even more colourful.

We slowly swam from pylon to pylon. They were covered in ascidians, soft corals, algae and sponges that hosted crabs, nudibranchs, seastars, blennies, porcupinefish, cowfish, leatherjackets and morwong.

An endless supply of subjects presented themselves for my camera – western gobbleguts, western rock scorpionfish, western smooth boxfish and western striped cardinalfish – lots of species with a first name in common.

Every second hole seemed to be occupied by a gloomy octopus, and we also encountered more than a dozen giant cuttlefish.

I spent most of my time head-down looking for critters, but would often look up to find myself surrounded by schools of yellowtail, trevally and juvenile samsonfish.

There were also many surprises, including several large tube anemones, a southern eagle ray grubbing in the sand and a pair of mating blue-swimmer crabs.

Almost an hour into the dive I finally found one of the endemic species I had hoped to see, a beautiful Western Australian seahorse. It was white, with pretty wavy black lines on its snout.

By the end of our two-hour dive we had found three more of these exquisite seahorses, another white one plus brown and purple specimens. It

Pictured: Kwinana Grain Terminal Jetty is one of the most popular shore-diving sites near Perth.

Top from left: Pink sea cucumber feeding at the jetty; Western Australian seahorses are found at muck-sites off Perth; the longspine dragonet can be seen at Ammo Jetty.

Below: A very rare sight: a well-camouflaged Glauert's frogfish.

had been an amazing muck-dive, no deeper than 9m and exploring only the first 100m of the huge jetty.

After lunch we headed to the northern end of Cockburn Sound to explore the small concrete Ammo Jetty. Less visually impressive than the Grain Terminal, its pylons were if anything even more colourful, covered in beautiful telesta coral.

The range of fish and invertebrates was different too. Standing out were the dragonets, which were everywhere. Most common species was the longspine, endemic to the region, but there were also finger dragonets and painted stinkfish (an Aussie term for some dragonets, which do have slimy, smelly skin).

OVER ANOTHER TWO-HOUR-LONG dive we encountered a wonderful range of endemic reef fish – boxfish, cowfish, leatherjackets, cardinalfish, triplefins, toadfish, blennies and two more West Australian seahorses.

Colourful nudibranchs and flatworms abounded. I even found a sea hare. These two magical shore-dives provided a great introduction to the Perth area.

The next day we headed offshore to dive Perth's main dive attraction, Rottnest Island. Located 11 miles offshore, it's a major tourist attraction, known for its cute quokkas, cat-sized marsupials.

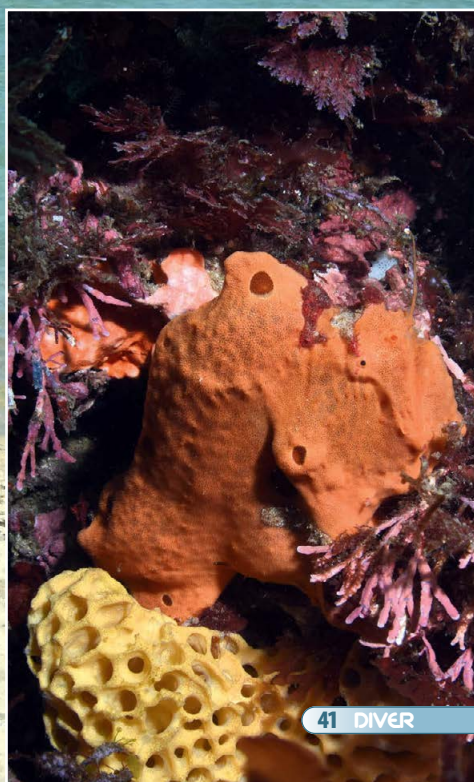
However, this 15sq mile island is surrounded by limestone reefs, offering endless diving possibilities. We booked two days on the *Lionfish IV* dive-boat.

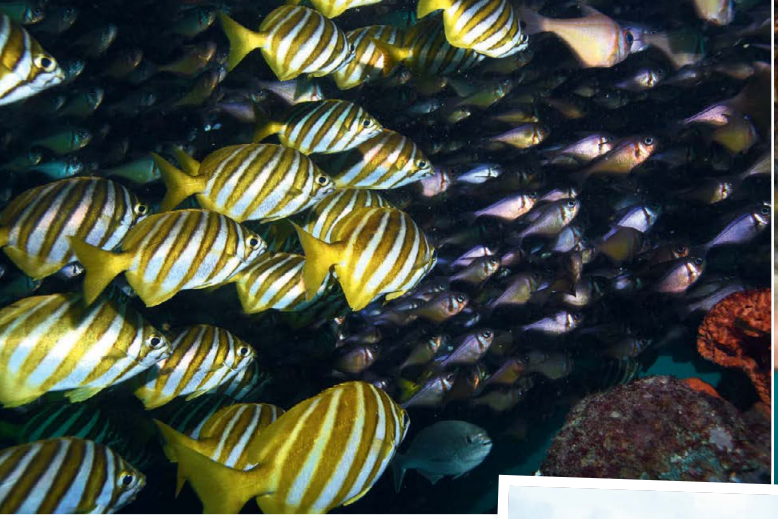
I have dived from many day-boats but this 24m vessel is easily one of the best. It can take 40 divers, has three levels, a comfortable saloon, a huge dive-deck and easy access to and from the water.

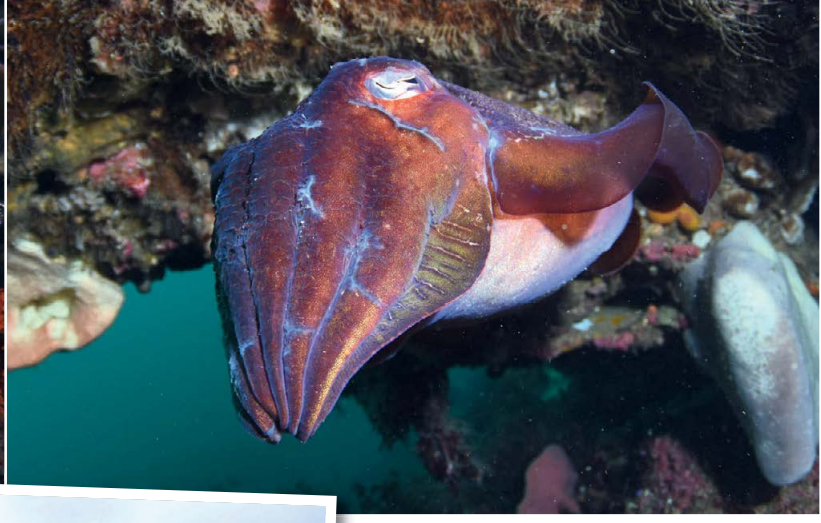
But the food is also a highlight – breakfast when you arrive, an incredible *smorgasbord* lunch and desserts on the way home. I'd be as big as a house if I dived from this wonderful boat each weekend!

Lionfish IV is owned and skippered by Andrew McGuckin, who has been diving the Perth area for 25 years and knows hundreds of local sites.

He took us to the north-west end of the island to dive the Slot after I had told him I would like to see one of the wobbegong shark species that are found only in Western Australia.







Nine of the 12 known species are found around the state, and several are endemic. Unfortunately, they are also far more shy than elsewhere, hiding out in caves and on ledges.

Conditions were not the best, overcast and with a big groundswell, the result of an unseasonal storm several days before.

We followed Andrew across a field of kelp to a large recess in the reef at 8m. He pointed out a small hole and plunged in.

I followed, which was hard work with the powerful surge. Andrew shone his torch about, pointing out crayfish and other critters in the dark until he found the resident western wobbegong.

The wobby was very annoyed by the attention, and I managed only a few quick shots before it swam off and disappeared into another crack in the reef.

Andrew then led us to the main feature of this site, a massive limestone cavern hidden under the kelp. It was spectacular, light-beams shining down from numerous small openings above, and walls and ceiling coated in colourful sponges, gorgonians, ascidians, soft corals and bryozoans.

Schools of fish flowed back and forth, including bullseyes, footballer sweep and gladius chub. It was a sight to which no photo could ever do justice.

WE SPENT THE NEXT 30 minutes exploring this amazing cavern. A torch was needed to investigate the numerous holes, cracks and ledges, almost every one home to a crayfish.

We also spotted a green moray, a smooth sting ray, marblefish, leatherjackets and dozens of southern blue devilfish. Highlights for me were two local fish, the white-barred boxfish and red-lip morwong.

Kingston Spit was a lot less surgey, but also featured caves and ledges. Schooling fish were everywhere, including old wives, bullseyes, pomfret, trevally and buffalo bream. Unique to the region were a harlequinfish and a striped stingaree.

Better weather the next day allowed us to dive a signature site, Shark Cave – in fact it's a giant swim-through, covered by a slab of rock and sloping from 15 to 24m.

Entering the cave I was ready to see sharks, but was first stunned by the fact that every available surface was covered in colourful sponges and ascidians and, swarming from floor to ceiling, a dense school of bullseyes and footballer sweep.

And swimming between these fish were six grey nurse sharks!

The sharks were unconcerned by our presence, and continued to patrol the cave. I settled on the bottom to watch and photograph them, and was quickly rewarded as one angled in towards me. The curious 2m shark slowly glided by, its small eye peering into my soul.

Over the next few minutes it made two more close passes before joining its brethren. We could have spent the entire dive in this cave, but exploring the rest of the rocky reef we found numerous reef fish, dozens of crayfish and a southern eagle ray resting on the bottom.

Our final dive at Jacks Patch was also wonderful, with more ledges, caves and unique West Australian species to be seen.

We could have stayed in Perth for several more days to further explore the incredible reefs of Rottnest Island, but we had more to see in the great south-west.

So we headed 100 miles south to Bunbury, second-largest town in Western Australia. A busy port, it is also a popular holiday spot and famed for its resident bottlenose dolphins that visit Koombana Bay to be hand-fed. While you can do dolphin tours, and even swim with the dolphins, we were more interested in Bunbury's other underwater attractions.

OVER THE NEXT three days we explored the area's rocky reefs and an artificial reef with Octopus Garden Dive Charters. It's owned by Kim Royce, quite a colourful character with plenty of salty tales to tell, and he operates the 12m vessel *Cross Country*.

Diving midweek, Stuart and I were the only divers and Kim suggested we first visit the area's most famous dive-site, the *Lena*. Leaving harbour, we were joined by a pod of friendly dolphins that rode our bow for 10 minutes. Thirty minutes later we tied up to the *Lena*'s mooring.

Scuttled in 2003, the *Lena* was a 55m fishing vessel captured by the Australian Navy for illegal fishing in the Southern

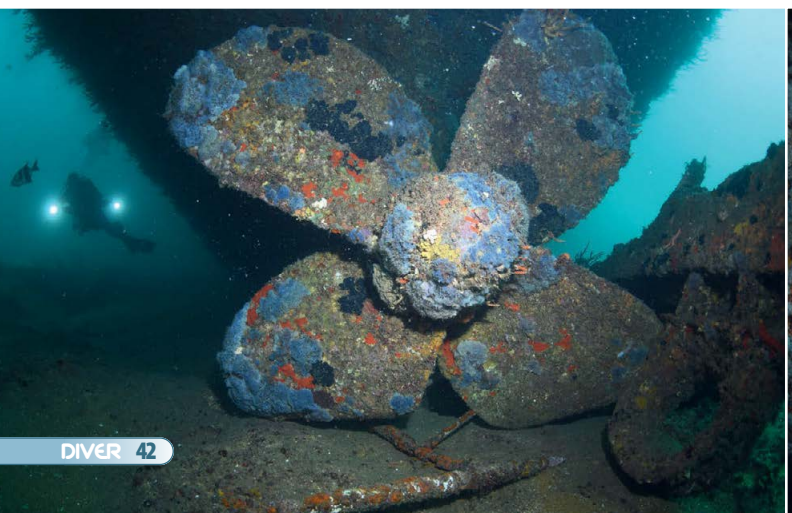
Top, from left: School of footballer sweep and rough bullseye at the Shark Cave; giant cuttlefish hide under the ledges on the reefs off Bunbury; old wives are a striking fish found in southern Australia; grey nurse sharks reside at Rottnest Island.

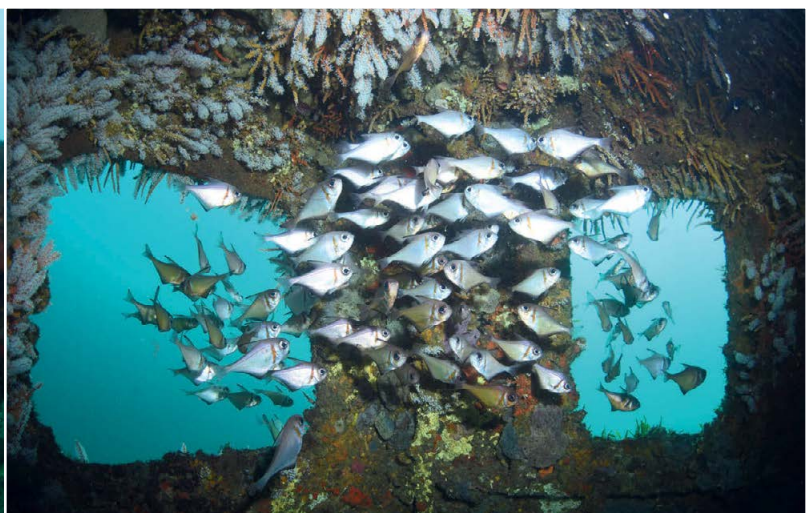
Above: *Lionfish IV* runs charters to Rottnest Island.

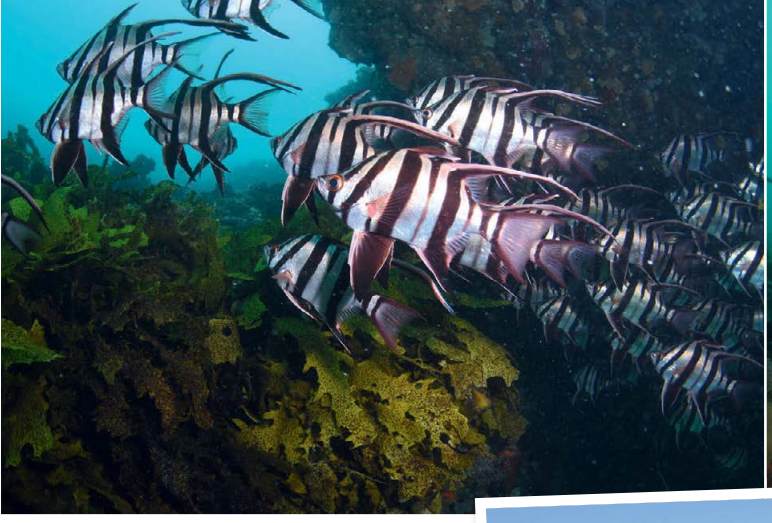
Above right: Octopus Garden Dive Charters boat.

Right: The white-barred boxfish is a signature fish from this area.

Below, from left: The propeller on the *Lena*; schools of rough bullseyes on the bridge; southern blue devilfish seem to live under every ledge off Bunbury; Stuart Ireland admires the fish and corals on the *Lena*.







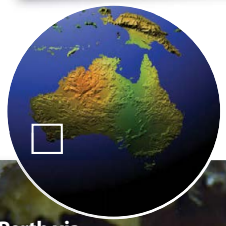
THE LEEUWIN EXPERIENCE
Western Australia's coast is unique in the Southern Hemisphere because of the Leeuwin Current. The west coasts of Africa and South America are bathed by cold north-heading currents from the Southern Ocean, but WA is washed by a warm tropical south-flowing current. This has allowed corals and other tropical critters to flourish in what is a temperate zone.

Ocean. Stripped and cleaned, the ship now rests in 18m and makes a superb artificial reef.

We followed the mooring-line to the bow, then dropped to the sand to find sponge gardens and seagrass beds. A slow circuit around the ship revealed cuttlefish, octopuses, a sparsely-spotted stingaree, nudibranchs, southern blue devilfish and many other temperate reef fish.

We stopped at the stern to investigate the prop, now covered in sponges.

Returning along the starboard side we found a large school of porcupinefish and moonlighters hanging in mid-water. It was time to explore the ship, encrusted with sponges, soft corals and algae.



On the bow sit several winches that are home to leatherjackets and wrasse. The bridge is a haven for thousands of bullseyes, while the kingpost swarms with blackhead pullers. After a circuit of the deck, we dropped into the holds and explored the lower levels of the ship – into the engine-room, along a conveyer-belt and into the freezer-rooms.

The wreck is fascinating but it was the fish-life that most impressed – schools of bullseyes, trevally and batfish, plus West Australian dhufish, boxfish, western talma, footballer sweep, morwongs, baldchin groper and many other species.

Nearby Lena Reef is typical of the inshore limestone reefs off Bunbury, a series of rocky ledges only 1-2m high.

It is covered in seagrasses, sponges and plate corals and we found numerous giant cuttlefish, southern blue devilfish, leatherjackets, bullseyes, wrasse and boxfish there, with a good collection of seastars, sea cucumbers and crayfish.

DURING THE FOLLOWING two days we returned to the *Lena* twice more and dived several more inner reefs. We had hoped to visit some of Bunbury's outer reefs, which lie 15 miles offshore in 30-36m depths and are covered in blade corals and schooling pelagic fish, but offshore winds made this impossible. The inner reefs were full of surprises, however.

At Peter's Reef we found that Glauert's frogfish mentioned at the beginning, but finding such specimens is a big challenge.

Gibbs Reef's bommies were covered in beautiful small gorgonians and another local, a masked stingaree, while Trevor's Reef impressed with its nudibranchs and other sea-slugs.

We could only wish we had been allowed a month to properly explore this fascinating part of Western Australia.

FACTFILE

GETTING THERE ▸▸ Many airlines fly into Perth via Asia and the Middle East. Internal flights are available on Qantas, Virgin and Jet Star. To reach Bunbury a hire car is the best option, or catch a bus or train.

DIVING ▸▸ Lionfish Charters, which operates most weekends and midweek on demand, lionfishcharters.com.au. Octopus Garden Dive Charters, octopusgardendivecharters.com

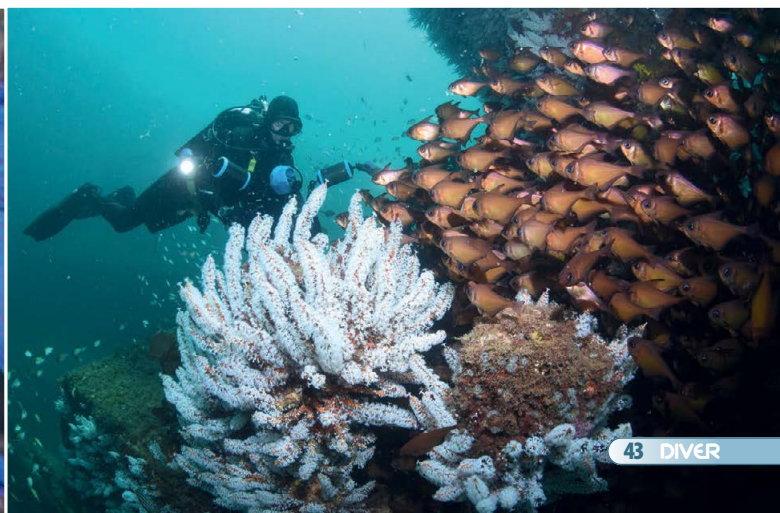
ACCOMMODATION ▸▸ A range of hotel and apartment options across the price ranges.

WHEN TO GO ▸▸ Year-round, but the best conditions are October-May. Water temperature in both areas varies from 23°C in summer to 17°C in winter. Visibility in Cockburn Sound is usually 6-12m and at Rottnest Island and Bunbury 12-20m, but 30m is possible.

MONEY ▸▸ Australian dollar.

PRICES ▸▸ Return flights UK-Perth from £540. Rottnest day's boat-diving from $170, Bunbury boat from $110.

VISITOR INFORMATION ▸▸ westernaustralia.com



I'm loggin' it

LOUISE TREWAVAS

I REALISE THAT THINGS have become desperate when the closest I get to a dive is rooting through my old log-books. Fond memories! Though I find these battered pages strangely thin on the rich detail that embodies the diving experience.

Back in the 1990s when new UK divers were called "Novices", I was sternly warned that no qualified diver in their right mind would dive with an "unknown" or newbie without first scrutinising their diving log-book.

Complete bollocks, of course. Back then, obedience to the instructor was 9/10ths of the way to achieve your qualification. We all bought log-books and wrote up every dive. The date, location, maximum depth, dive-time, safety stops, equipment used, air consumed, visibility, water temperature, and notes on what we saw – all had to be signed and authenticated.

Perfect! Until, about 60 or so dives later when the "newbie" tag had worn off. The record-keeping urge slackened and the details often dwindled to a minimum. A shame, because as time passes you need help to revive those experiences.

GoPros hadn't been invented. Underwater cameras were expensive and strictly for specialists. The humble diver's log-book was all we had as an *aide memoire*, and frankly it's a bit rubbish.

Who cares whether the dive time for dive number 23 at Shag Rock in Plymouth was 34 minutes? The maximum depth reached was 16m and the visibility was "milky, about 10m". The notes mention lots of kelp, but these details barely scratch the surface.

THE CLUB RIB WAS PERCHED perilously in the swell, lashed against the stone steps of Bovisand harbour.

The steps were slippery, wet with sea spray and smelling of rotting seaweed. Hauling my heavy kit and remembering all the weight-belts and goody-bags was an arduous task.

The club was under pressure to board quickly because other boats were waiting, but one wrong foot would spell disaster. The boat-handler, an experienced and jovial guy, was uncharacteristically tense and snappy. As we left the shelter of the harbour, the sea was choppy and a mournful shade of grey. It was perfectly matched by the colour of the diving officer's face. Nobody spoke.

The club minibus had arrived late the previous evening but, thanks to the "unorthodox" bar hours at Bovi, the diving officer had been drinking until 3am. His girlfriend had been found asleep in a bush shortly after 1am, having failed to make it back to the dorm.

We stayed in the crumbling buildings of Bovisand Fort. Sleeping (amid the snoring) in bunks and living in our undersuits to stay warm. A few twigs in your hair was unlikely to attract much attention in the canteen at breakfast; a huge glistening fry-up of eggs and bacon, sliding in cooking oil.

Sadly none of this is among the mundane details in my log-book. I hold it against my face and inhale. The faint smell of chip grease haunts my nostrils.

Ah yes – several of the lads would always insist that we stop at a motorway service station for a McDonalds on the way back to London. I'm not a fan, but that smell vividly evokes time and place.

This log-book has hidden powers! I wasn't lovin' it but I've definitely been loggin' it.

Many divers' worst nightmare is to be left behind by the boat. SIMON PRIDMORE sets out the steps to take to boost your sense of security. This article has been updated from one that appeared in 2016

MAXIMISE YOUR SURFACE SAFETY

BECAUSE DRIFT-DIVES can carry divers over long distances, loss at sea is a real risk, and it is essential that you be prepared and equipped in case this happens to you.

CHOOSE WELL

First of all, the most effective strategy for protecting yourself against loss at sea when drift-diving is to choose to dive with an operator that has expert knowledge of the waters in which you're diving, an excellent safety record, experienced guides, a low guide-to-diver ratio and, importantly, as you will see below, staff deployed on board the boat solely as surface supervisors to track the dive while you're under water.

WHEN IT GOES WRONG

This advance research is required, because not all operators can be trusted.

Below: Crew on a tender looking out for divers.

A few years ago a dive-centre in Bali, Indonesia, chartered a boat to take five divers and two instructors out to some islands off the coast.

It was wet season and, behind the raincloud gathering overhead, there would be a full moon that night in an area where, even at the best of times, currents are notoriously strong and unpredictable.

After about 10 minutes under water, they found the current so strong that it was difficult to keep the group together, so they ascended early to find that a storm had swept in.

Surface conditions were now very rough and the rain had reduced visibility to a few metres only.

GONE

The only people left on board the boat were the captain and crew, who were not working for the dive-centre. Their job was just to run the boat.

Having been told by the instructors that the dive would last an hour or so, once the divers had departed the boat-crew just sat at anchor, sheltered from the storm, and dozed.

After 45 minutes or so they roused themselves and moved off to look for the divers in the area in which they were originally expected to ascend. They searched but failed to find them. Then night fell, and the divers were gone.

A little over 72 hours later, searchers found four of the divers perched on rocks some 12 miles away from their original entry-point, and one of the instructors in the water nearby.

The bodies of the remaining diver and the other instructor washed up on shore in the following days.

Below and right: Deploying and hanging onto a DSMB.

NOT A ONE-OFF

This is not a bizarre one-in-a-million accident. Indeed, it was just one of a depressingly similar series of such incidents that used to take place in the same area.

Another involved a fishing-boat that picked up eight divers adrift in 3m seas off southern Bali.

The divers had begun the dive late in the afternoon as part of a group of 12, had become separated from their guide and surfaced out of sight of the dive-boat, which was then forced to return to port after a very brief search because it didn't have night-running lights.

The recovery of the divers was completely fortuitous. The fishing-boat was not looking for them. In fact, nobody was. A search had been planned, but was not due to begin until dawn.

TECHNIQUE 1: JUST SAY NO!

As these stories demonstrate, you can't just leave your fate in the hands of a dive operation. Some do not take safety seriously enough, and even with good dive operations accidents can happen, a boat-engine can fail or someone can make a mistake.

You have to share the responsibility for your own safety on a drift-dive and be armed with equipment, self-rescue techniques and strategies to help you be recovered if something goes wrong.

An excellent survival strategy, especially when diving with an operator you don't know, is just to say "No!"

If the briefing, water conditions, demeanour of the boat crew or any other factor just seems wrong to you, exercise your right to refuse and sit the dive out.

You don't have to give a reason, you don't have to make a big deal out of it, just say: "This one's not for me."

TECHNIQUE 2: SHOW THEM WHERE YOU ARE

Carry a delayed surface marker buoy (DSMB) or safety sausage on every dive. Choose long and thin rather than short and fat, and go for either fluorescent yellow or fluorescent orange for maximum visibility, although one commercial diving survey did report that the easiest colour to pick out at sea was bright pink!

Some models have white reflective tape sewn on the top; this is a really useful addition, because a flash of sunlight will draw a watcher's attention.

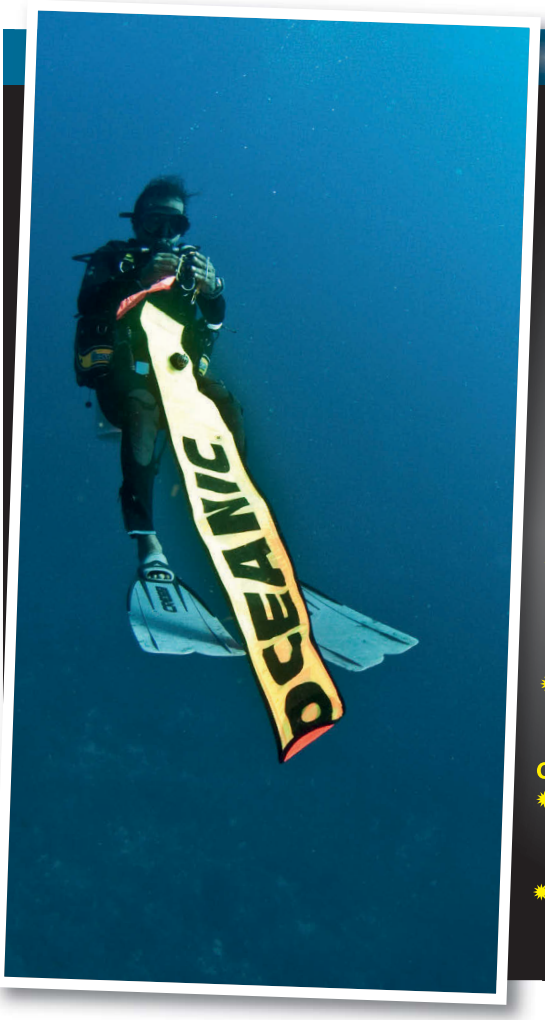
ANDREY BIZYUKIN

Attach 6m of line to the bottom of the DSMB so that you can deploy it from your safety stop to give the boat-crew advance notice of where you are.

Or use a reel and line if you want to send it up from depth and use the line as an emergency-ascent platform.

Deploying a DSMB under water is something you will need to practise a few times but it is a useful skill to have (*see panel below*).

Another very important reason for using a DSMB is to mark the place where divers will be ascending so that boat traffic can steer clear.



ANDREY BIZYUKIN

HOW TO DEPLOY A DSMB

STEP 1: GET IT READY

- Well before you arrive at your safety-stop depth, take out your DSMB and unclip your reel.
- Attach the end of the line to the DSMB and unfurl the DSMB so that it drifts away from you. Keep hold of the reel.
- Look at it carefully; make sure neither the DSMB nor the line is snagged on you or your dive-gear.
- Pull the DSMB back towards you. Unlock the reel.

STEP 2: CHOOSE INFLATION OPTION

OPTION 1

- Tilt your head, raise the open bottom of the DSMB above the exhaust of your regulator second stage and exhale into the bag, gently at first.
- Watch out! Make sure the line doesn't get snagged as you do this.

OPTION 2

- Take your octopus, hold it under the open bottom of the DSMB and press the purge button gently and briefly.
- Watch out! If you purge too hard or if the regulator starts to freeflow, your DSMB will fly out of control.

OPTION 3

- Take your BC inflator hose, hold it under the open bottom of the DSMB and press both inflate and dump buttons simultaneously.
- Watch out! Make sure you press BOTH buttons so you don't inflate your BC instead.

STEP 3: SEND IT UP

- Only put a little puff of air into the DSMB at first, just enough to make it stand up.
- Check where the line is at all times so that it doesn't catch on you or your equipment.
- Position yourself in the water underneath the DSMB and the line and look up at it.
- Make sure you are not under a boat or platform.
- Make yourself a little negatively buoyant.
- Add one or two more little puffs of air until you feel the DSMB wants to get going.
- Add a final larger puff of air and then release it.
- Keep hold of the end of the line.
- Watch the DSMB and the line as it rises.
- When the DSMB is at the surface, pull the line tight so that the DSMB stands up straight.
- Check your depth, then do your safety stop, keeping the line tight and looking up to make sure that everything is still OK on the surface, ie that the DSMB has not collapsed and you haven't drifted onto an obstacle.

Left: Tall, thin and fluorescent yellow is a good DSMB choice.

Above: Recovered to the boat after being spotted.

Below left: Noisemaker.

Especially in choppy seas, it's difficult for a boat-crew to see divers' bubbles, and you don't want the boat right on top of you as you come up.

For the same reason, it's a good idea for the whole team to make the final ascent to the surface close to the DSMB at the same time.

On occasions when your drift-dive might take you into areas of shallow water where there is a lot of boat traffic, you might even consider putting the DSMB up right at the start of the dive.

This can complicate matters, however, because the diver dragging the buoy might find it hard to stay with the group, especially if the direction of the wind at the surface doesn't match that of the current.

TECHNIQUE 3: SHINE A LIGHT

Carry a light on every dive, even daytime ones, not only so that you can look inside holes for shy marine life, but so that you can use it as a signalling device in an emergency.

You can even beam it up through your DSMB to create a highly visible light sabre.

The only reason that the fishing-boat found the drifting divers in the earlier story was because one of the divers was carrying a light.

A length of cord is useful to keep the dive-team together. The line on your buoy or your reel will do the trick nicely. It's all too easy to drift apart on the surface, and a group of divers makes a bigger target for searchers to spot.

Share safety devices, take turns to rest and keep each other's spirits up.

TECHNIQUE 4: CARRY-ON SIGNALLING & SURVIVAL AIDS

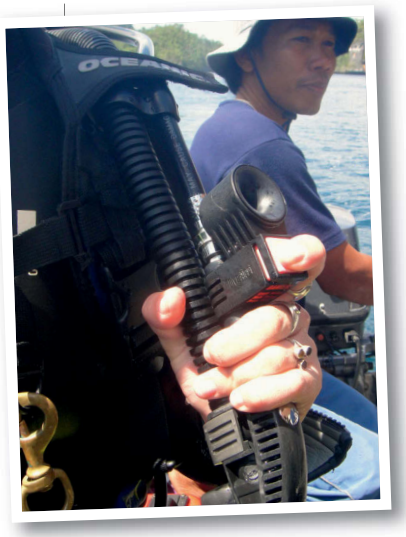
A piece of unbreakable mirrored card, (the stuff they use in aircraft bathrooms) makes an excellent daytime signalling device.

Point the card in the direction of a vessel in the distance and move it from side to side to catch the sun. If you can't find this type of card, use an old DVD.

Traditionally whistles have been standard dive-gear, but these are not very effective except over short distances, and even then only if the wind is in your favour.

A power horn attached to your BC inflator hose is much more effective.

Two major threats to your survival on a long surface drift are exposure and dehydration. A hood is not only useful for keeping you warm but will protect your head and neck from the sun on the surface.



Adding reflective flashes to the hood will increase your visibility.

TECHNIQUE 5: MAKE USE OF TECHNOLOGY

In remote back-country skiing, where avalanches are a risk, everyone is equipped with an avalanche beacon, a device that emits a signal to help searchers find a skier buried in snow.

Wonderful as it might be to imagine a world in which every diver is required to carry a similar device in case they become lost at sea, this is unlikely to happen any time soon.

However, there is a practical alternative available.

A technical-diving instructor friend of mine found himself drifting alone in the South China Sea after a series of unusual events.

He looked around, saw where he was in relation to the land, pulled out the hand-held marine rescue radio with GPS that he carries on every dive and called the boat to come and pick him up. No drama!

These radios represent the most significant advance in safety at sea in recent years, benefitting not only divers but surfers, paddlers, fishermen and sailors too.

They cost under £200 each so, for the average dive operator, an investment of £1000 or so is all that is required to arm every surface dive-supervisor and in-water guide with a unit, and eliminate the risk of losing divers at sea almost completely.

Isn't that the sort of approach divers should reasonably expect from the people they pay to take them diving?

Read more from Simon Pridmore in:

Scuba Confidential – An Insider's Guide to Becoming a Better Diver

Scuba Professional – Insights into Sport Diver Training & Operations

Scuba Fundamental – Start Diving the Right Way

Scuba Physiological – Think You Know All About Scuba Medicine? Think Again!

Scuba Exceptional – Become the Best Diver You Can Be

All are available on Amazon in a variety of formats.

BRANDI MUELLER thought her leg was being pulled when she was first told about the wreck 'n' shark diving off the coast of North Carolina – but it wasn't

EAVESDROPPING AS A colleague was showing off images of sand-tiger sharks covered in clouds of baitfish, I soon forgot my initial task and became captivated in his slide-show.

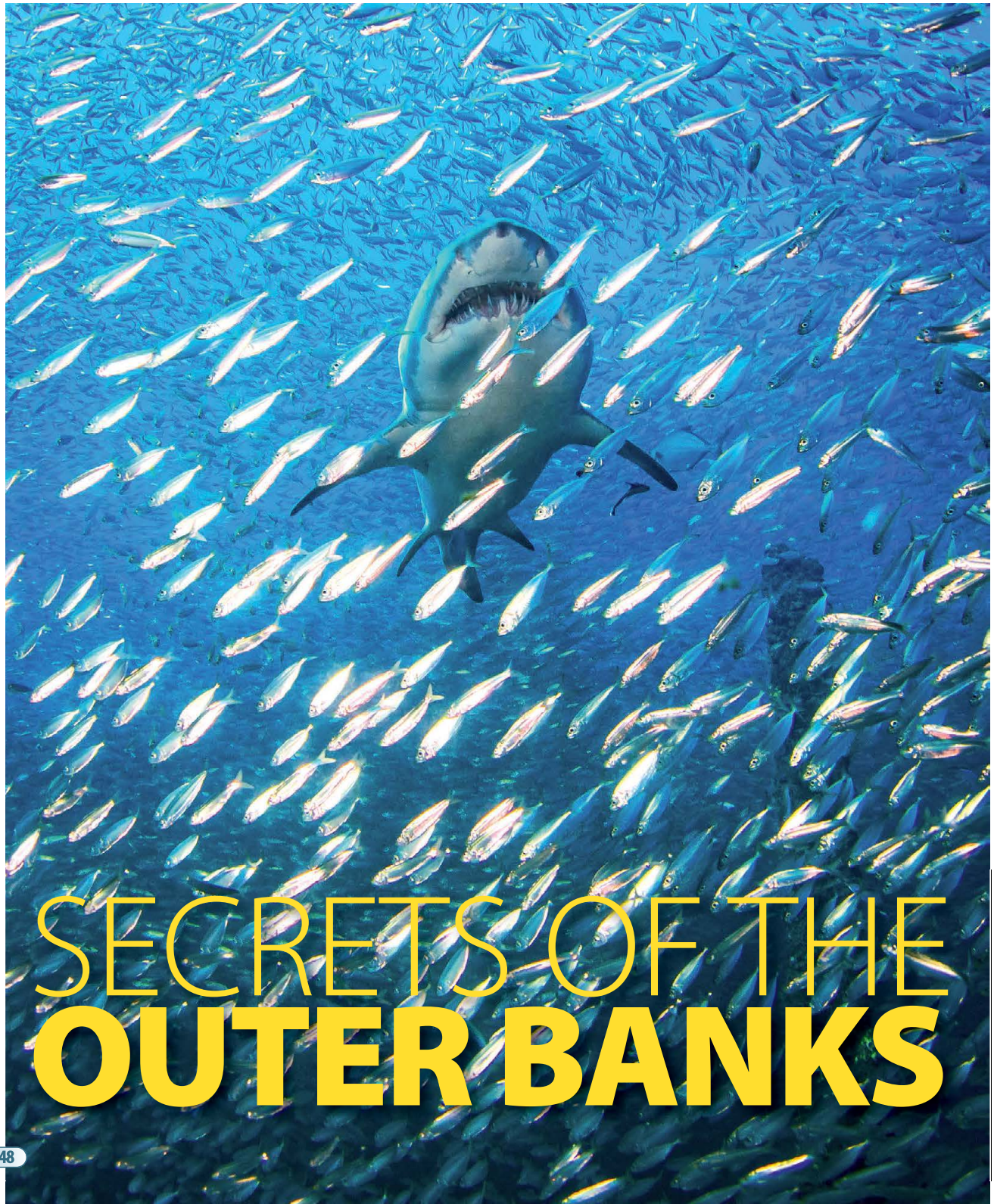
Images of the scraggly toothed, menacing-looking sharks appeared on the screen one after another. Then there was an image of a shark with a wreck behind it. Where was this secret, magical, underwater world of sharks and wrecks that I needed to dive right now?

"North Carolina," he said. I raised an eyebrow in disbelief. Really? North Carolina? And if that's true (and I wasn't totally convinced) how cold was the water? "In the summer it can get as warm as 27°C," he assured me.

Hmm, that didn't sound too bad, and from that moment I was committed to diving the Graveyard of the Atlantic.

Several months later, I found myself at the dock of Olympus Dive Centre in Morehead City at 6am. The sun was rising over placid water and I was still half-asleep waiting for the coffee to kick in, but the dive-shop was bustling.

Two boats were being loaded with tanks, dive-kits, camera systems and other divers who were also holding onto warm mugs filled with whatever rocket-fuel-laden drink was necessary to help one



SECRETS OF THE OUTER BANKS

wake up at this early hour. Before long, the chaos had subsided and the boats departed over glass-like water towards the rising sun.

Before flying to North Carolina I had remained mystified about this dive location about which I knew so little.

I had asked around to learn more (just in case my co-worker had been fooling me all along). One thing he didn't mention, but many others did, was the potential for rough seas.

The wrecks of the Outer Banks usually take a one- to two-hour boat-ride to reach and I heard many horror stories of seasickness, along with raving reviews of the wrecks and the sharks. Many people had even told me to add some extra days to my trip, because getting blown out by the weather was common.

However, as we left the protected harbour and got out into the open sea off North Carolina, the water stayed glass-smooth. It was a perfect day for diving. The long boat-ride passed quickly as I got to know my new dive-buddies, and soon enough we were moored at the *Caribsea*, a WW2 wreck sunk by a torpedo in 1942, and a popular site for seeing sand-tigers.

Bracing myself for cold water (even though I had been assured that it was warm) I did a giant stride off the side of the boat and was shocked to find that they hadn't lied to me. The water was around 28°C but it was late August, which does get some of the warmest temperatures of the year. Expect cooler temps in winter and spring.

Above, clockwise from top: One of the Olympus Dive Centre dive-boats; barracuda seen on a safety stop after diving the *Caribsea*; sand-tiger shark on that wreck.

Left: Shark and baitfish on the *Atlas* wreck.

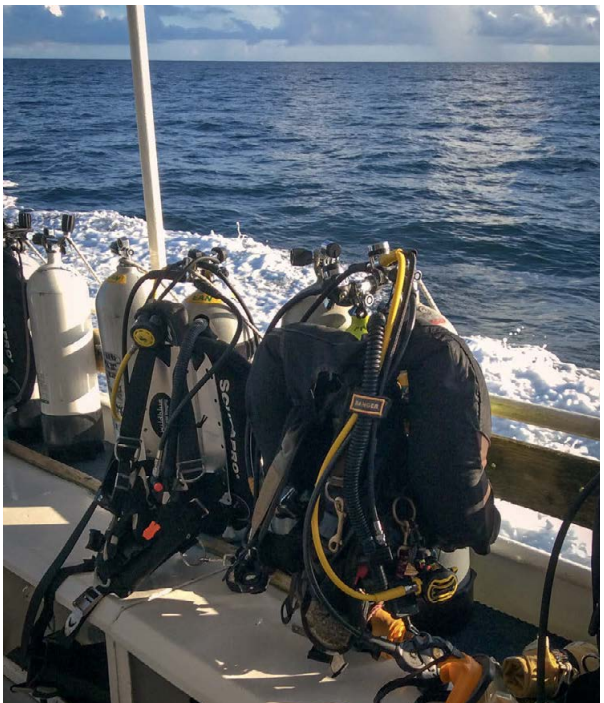
There was some current but a line system under the boat made it easy to pull ourselves to the mooring-rope and make our way to the wreck. Visibility was around 20m and the *Caribsea* soon came into view, covered in a cloud of baitfish that seemed to take on the shape of the wreck. I made my way towards that cloud.

There is something incredible about being surrounded by baitfish. With every movement I made the fish moved in turn; thousands of specks of silver going from dark to silver in an instant, and then back dark again.

I couldn't see beyond the fish except when I exhaled, and they would part above me, allowing me to glimpse open water momentarily before they filled the space again.

As I fired the strobes on my camera they would all shift and the light would reflect on their small bodies, almost as if they were firing a shot of collective light back at me.

The constant movement and bright and dark flashing was almost disorientating. I started to feel I was losing a sense of time and place – my world was nothing but a ball of fish and I was within it.



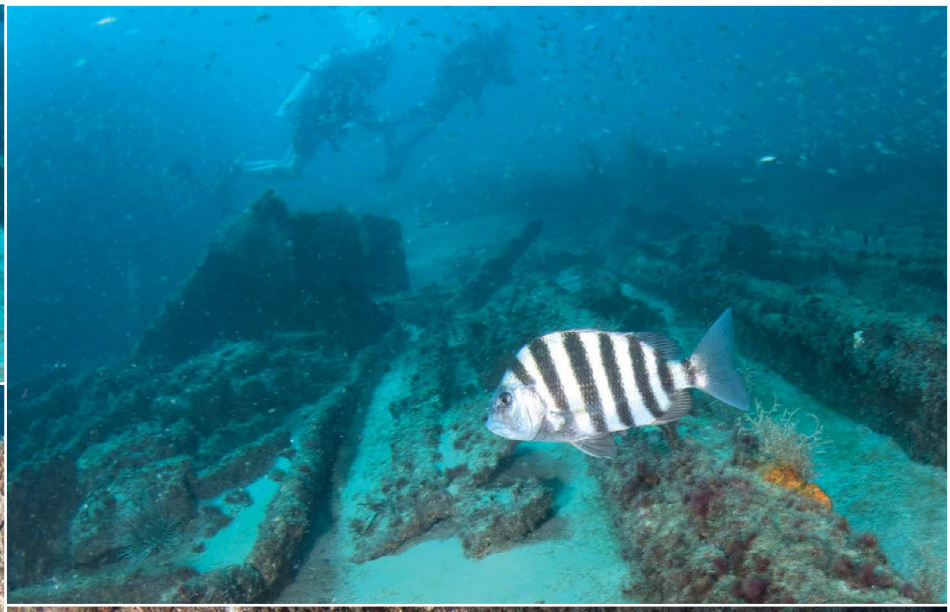
AS I TRIED TO WRAP my mind around this new fish world, they slowly parted and in came a massive tank-like shadow – a sand-tiger shark.

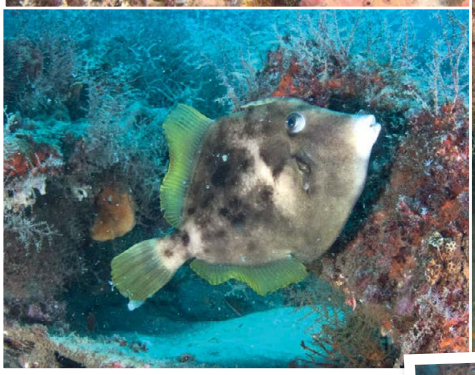
It didn't flinch or change speed or direction. The baitfish moved to make way for the shark and then closed in as it left. I decided that it would be best if I got out of the way too, just like those fish.

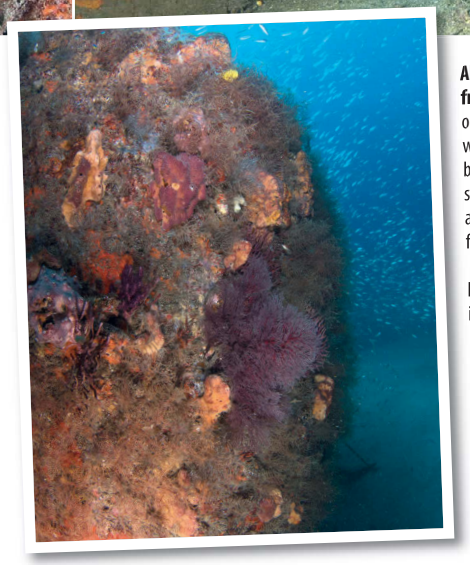
Swimming around the *Caribsea*, at times I could hardly make out the structure of the wreck because of the baitfish and the sharks that would criss-cross it slowly but with purpose.

At one point I heard a crack echo through the water, sharper and louder than anything I expected to hear while submerged. At first I didn't know what it was, but then realised it was the sound of a 150kg sand-tiger making a sudden thunderous movement and moving with unexpected speed.

Our second dive was on the *Ashkhabad*, a Russian freighter sunk by the Germans in WW1. This wreck was broken into many pieces and had mostly collapsed onto the seafloor, but it had lots of







Above, clockwise from top left: Fish on the *Ashkhabad* wreck – black sea bass; sheepshead; spadefish; triggerfish; a lionfish surprisingly far north.

Left: The *Ashkhabad* is a colourful wreck.

marine life. We saw several lionfish (which was sad, because I hadn't realised that the invasive species had made it that far north of the Caribbean), sheepshead, black sea-bass, triggerfish and even some angelfish. Colourful sponges, seafans, and corals covered the remains of the wreck.

The next day we visited another WW2 wreck, the *Atlas*, a tanker torpedoed by a German U-boat in 1942.

This wreck is another favourite of the locals because of the swarms of baitfish and numerous sand-tigers. I couldn't help but be fascinated by these sharks, which look so mean and big (they can be upwards of 3m long) but yet were docile, would swim so close and not even seem to care about the divers snapping photos and gawking at their presence.

Sand-tiger sharks (which are sometimes referred to as raggie, grey nurse or raggedtooth sharks) occur in temperate waters around the world, but usually in deep water.

The Outer Banks is one of only a few regions where these sharks congregate in shallower waters, to the delight of divers.

They exhibit some really interesting behaviours too, one being that they come to the surface for breaths of air – not because they need it to breathe, but because they have a swim bladder that helps them control their buoyancy.

I CAN'T TALK ABOUT sand-tigers without also mentioning their unique reproductive habits. Females give birth to live, fully developed young that have been hatched from an egg within the shark.

Usually 15-25 eggs are fertilised and begin growing, but the first to hatch will then eat the others to survive.

This is called intrauterine cannibalism, and science knows of only two species of shark that do this. Usually only one or two babies survive to birth. Sort of brings new meaning to sibling rivalry.

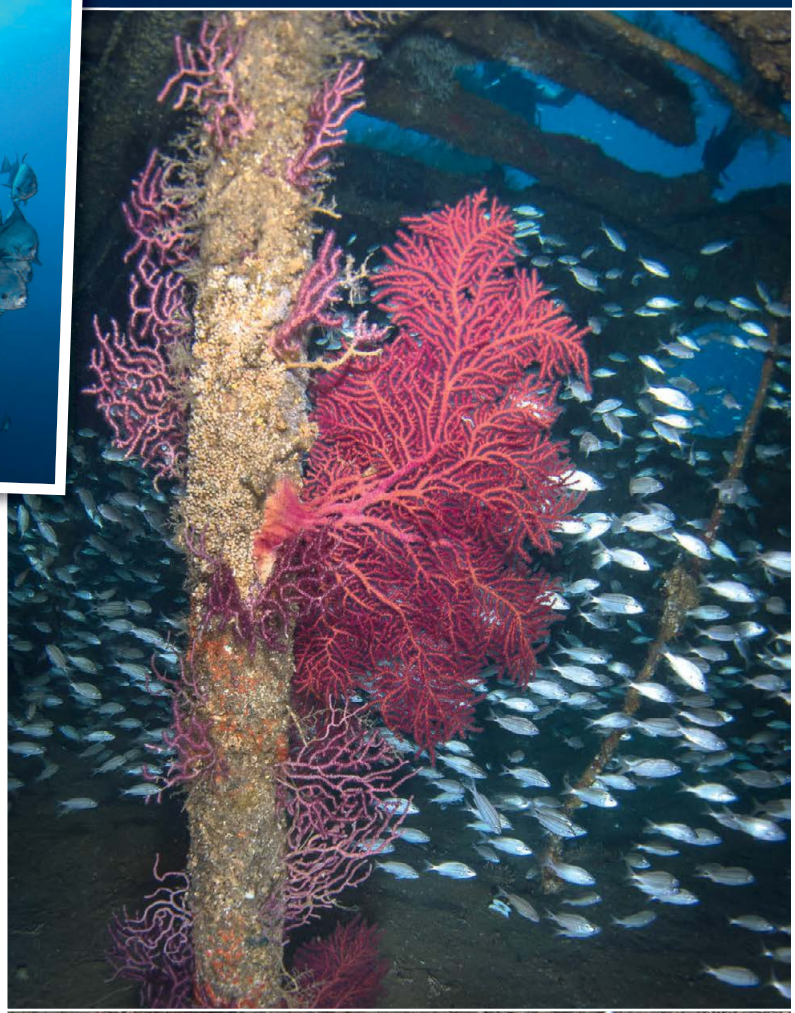
We also dived Hardee's Wreck, which was artificially sunk to encourage reef growth, fish aggregation and the acquisition of tourism dollars from divers and fishermen. It has achieved its goals, and we saw a school of spadefish as we descended, a lot of growth on the wreck, a few sand-tigers and several barracuda.

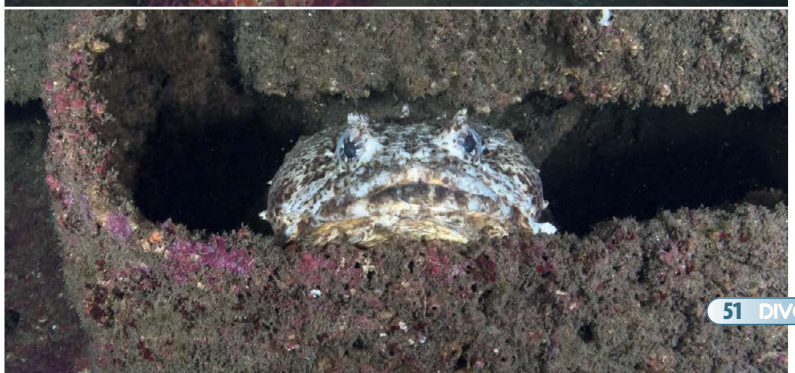
On my last day of diving we dropped onto the *Portland*, which met its fate during a storm and ran aground.

This wreck often has terrible visibility, but we got lucky because parts of it being clear, although others were shrouded in silt. The silty clouds imparted an eerie mood, as the sand-tigers would emerge from them before disappearing again.

I was cynical about how much fish-life I would see diving the Outer Banks. I knew (or at least hoped) that there would be sand-tigers, and there definitely were.

But I was repeatedly shocked to see a





Top: A sand-tiger shark on the *Atlas*.

Above: Spadefish in formation on the *Atlas*.

Right: Seafan on Hardee's Wreck.

Below right: Toadfish on the *Atlas*.

lot of fish species I recognised from the Florida Keys and the Caribbean, as well as coral and sponges.

I had no idea that queen angelfish came so far north, and there were also toadfish, trumpetfish and arrow crabs. I learnt that this was the result of warm Gulf Stream waters pushing northward past North Carolina offshore, creating a sort of blending area for the warm waters from the south and cooler waters from the north, and increasing biodiversity.

WITH AN EARLY-MORNING departure flight I had a whole day of no diving to explore the area around Morehead City and Beaufort.

These cute coastal towns are lovely holiday destinations on their own, with plenty of waterfront restaurants and bars, shops, museums, an aquarium, and easy access to explore nearby islands.

I took a short morning ferry ride over to Shackleford Banks, part of the Cape Lookout National Seashore, which is a barrier island system known for its

wild mustang population. I spent the morning walking along cotton-soft sand in the company of horses that seemed not even to notice me.

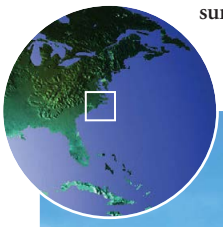
As I headed back to the airport I realised that this wouldn't be my only trip to dive the wrecks of the Outer Banks. I had hardly scratched the surface of the wrecks waiting there for divers.

One in particular I had missed was the U-boat *U-352*, which went down in 1942. But the list of other wrecks to dive seems endless – so many ships have been lost because of the hazardous coast, pirates and multiple wars, plus those sunk on purpose.

They all have secrets to reveal to the adventurous diver.

Above: Sand-tiger sharks and baitfish on the *Atlas*.

Below: Mustangs at Shackleford Bridge.



FACTFILE

GETTING THERE ▸▸ Brandi flew into the Coastal Carolina Regional Airport (EWN) in New Bern, NC and drove an hour to Morehead City. From the UK there are direct flights to Raleigh, which is about a three-hour drive away.

DIVING & ACCOMMODATION ▸▸ Olympus Dive Centre has a bunkhouse, but there are plenty of hotel and B&B options in the area, olympusdiving.com

WHEN TO GO ▸▸ May-October are the most popular months for diving, with warmer temperatures and a higher likelihood of calmer seas. Diving is possible year-round if the weather permits.

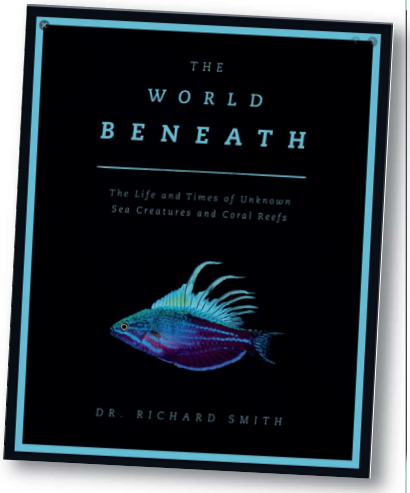
MONEY ▸▸ US dollar.

PRICES ▸▸ Return flights from £300. The Olympus bunkhouse costs $30pp per night. Day dive-trips $135 without gear and tanks.

VISITOR INFORMATION ▸▸ crystalcoastnc.org

NOT JUST ANOTHER MARINE-LIFE BOOK

The World Beneath: The Life and Times of Unknown Sea Creatures and Coral Reefs by Richard Smith



ANOTHER BOOK ABOUT the wonders of fish and coral? Ho-hum, a picture has already formed in your head. We've been there before – so many times.

But wait, this one is different. Very different. Instead of the usual worthy but dull plod through every half-familiar aspect of coral from acropora to zooxanthellae, illustrated by endless general reef shots unlinked to the text, this book by Dr Richard Smith is a surprise-filled delight from start to finish.

It's not difficult to analyse what makes *The World Beneath* so good. First, Smith sees the underwater world through the eyes of a scuba diver. In the text he relates everything to his own experiences as marine biologist and underwater photographer.

So instead of dry facts, he shares his sense of discovery and wonder with us as we go.

It's often been said that the best underwater wildlife photographers are marine biologists because they know what to look for, where and when. Where I just see a colourful fish, they know its age and sex and behaviour patterns; they spot the eggs, the parasites, condition and know its family connections.

Their sharp eyes detect the tiny and the well-camouflaged; they even know when what they're looking at is some rare hybrid.

The author specialises in macro subjects so has an incredible eye, but on top of all that he is a gifted photographer. This book is generously illustrated but these are not reference shots; they have artistic merit. They are related directly to the text and complement it. The pages fly by.

Smith has first-hand and recent experience of discovering new species, so he knows what he's talking about. His particular interests are reflected through the chapters: pygmy seahorses, anemonefish, flasher and fairy wrasse and so on.

Illustrating all the above qualities for me was one passage in a chapter about colours of the reef.

Diving in Indonesia, the author finds a tiny orange fish that even he can't identify. He later finds out that it's a juvenile Cross's damselfish.

But then he goes looking for it again in the same spot three months later and finds it, only it has grown up. It is now in a mossy-green transitional phase. He takes its picture both times and can state with confidence that it's the same fish. Just imagine!

I learnt so much from this book, and the learning process was a pleasure. I discovered little things, such as why juvenile fish can look so different from the adults – because when they arrive parentless on the reef from their open-sea larval stage, they don't want to be seen as a competitor for food by the resident adults.

The descriptive writing is instantly relatable: "*...the atmosphere felt both eerie and tranquil in equal measure. As I passed the jetty, I steeled myself for the mutual startling that the resident sleeping turtle and I shared each morning. Jolted out of his repose, he barrelled past at great speed and disappeared into open water...*"

One of the few things *The World Beneath* does have in common with run-of-the-mill reef books is the obligatory final chapter on the doomsday challenges facing coral today. Even here, Smith has original thoughts to share.

One in particular struck me – that there is little point in continuing to spend money researching the causes of coral-reef decline. Why? Because we already know them. Divert it instead to implementing renewable energy sources. Many researchers may disagree, but it's typically forthright.

I reviewed the US version of the book; it comes out in Britain in September. If you invest in one diving-related book this year, let it be this one. You won't regret it.

Apollo Publishers
ISBN: 9781948062220
Hardback, 312pp, 21x27cm, £26.99

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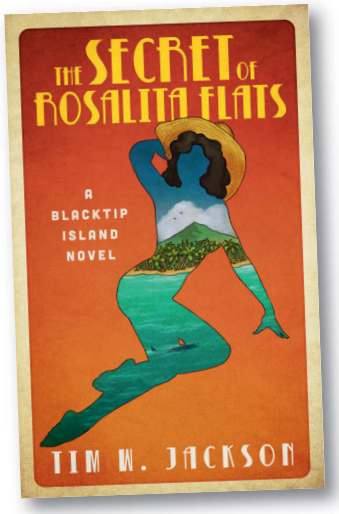


The Secret of Rosalita Flats by Tim W Jackson

NOW THIS NOVEL was a pleasant surprise. It's Tim Jackson's second book about the imaginary Caribbean island of Blacktip and its eccentric cast of characters, and he also writes *Tales from Blacktip Island* short stories and a *Blacktip Times* blog, but this was the first I'd heard of the place.

The author tells us that his first taste of scuba came at the age of six, when he sneaked breaths off his dad's double-hose regulator in a pool. Apparently he still uses the reg to this day. After toying with journalism he headed for the Cayman Islands to work as a diving instructor and boat captain by day and write fiction at night. That was a long time ago but it sounds like a good move.

Receiving a thriller from the Cayman Islands to review at once put me in mind of the last one I read. It wasn't great, but although I said as much in **DIVER** the author cheekily extracted a few words from the review suggesting that I thought the opposite, and still quotes them. I have to admire his attitude.

No lingering resentment about this marred my enjoyment of *The Secret of Rosalita Flats*, however, because I soon realised that Jackson is a very good story-teller. The book centres on Cal Batten, who returns to Blacktip Island after his estranged father's death. He wants only to dispose of the family home, the weirdly shaped Batten's Down, and get back to life in the USA, where he repairs clocks and watches.

On Blacktip he meets Rosie, his father's housekeeper (or something more?) and childhood friends Rafe, now the island cop, and attractive Marina, a diving instructor.

The old homestead soon becomes a nightmare for Cal as unknown Blacktippers seem intent on tearing it apart in search of whatever it was his dad had stashed away there.

But oddly our hero seems far more concerned about sharks than the clear and present danger from humans who have it in for him.

What I found refreshing was that for once a diving-novel hero was not a highly accomplished scuba-diver and underwater fighter – in fact Cal is someone who will go out of his way to avoid the underwater world. But Marina has other ideas.

The imaginative detail and titillating puzzles kept me turning the pages happily and, far-fetched as the story might be, the resolution was perfectly satisfying.

There are moments of genuine tension, although Jackson isn't quite up to Lee Child levels in sustaining a dramatic arc all the way through to the reveal. But I wasn't disappointed, and would certainly read the sequel if it were to come my way. A good bet for your next plane journey.

Devonshire House Press
ISBN: 9781735113616
Softback, 300pp, 14x21cm, £10.33

Reviews by Steve Weinman

TOP 10 BEST-SELLING SCUBA-DIVING BOOKS

as listed by amazon.co.uk (21 July, 2020)

1. **100 Dives of a Lifetime: World's Ultimate Underwater Destinations,** by Carrie Miller & Brian Skerry
2. **Scuba Professional: Insights into Sport Diver Training & Operations,** by Simon Pridmore
3. **Amazing Diving Stories – Incredible Tales from Deep Beneath the Sea,** by John Bantin
4. **Underwater Foraging – Freediving for Food,** by Ian Donald
5. **Dive the Isle of Wight & Hampshire,** by Kendall McDonald
6. **The Art of Diving: And Adventure in the Underwater World,** by Nick Hanna & Alex Mustard
7. **Open Water Diver Manual,** by Drew Richardson
8. **Deco for Divers: A Diver's Guide to Decompression Theory and Physiology,** by Mark Powell
9. **Dive the Isle of Man,** by Ben Hextall
10. **Fifty Places to Dive Before You Die,** by Chris Santella

'If people have true callings, I have found mine, and it's a strange one' – Californian diver NATALIE GIBB's sentiments entirely

DIVING INTO THE DARK

MY ASPIRATION IN LIFE has always been to be an explorer. Before I discovered cave-diving, I considered many careers that would allow me to indulge my curiosity in the world, including science.

Scientific discovery has always been a very real type of exploration for me. I have a degree in chemistry and was considering research in that field for a while.

I became a diver through happenstance. I took a spur-of-the-moment weekend trip to the Florida Keys, wandered into John Pennekamp State Park, and signed up for a scuba course on a whim.

My first open-water dive changed everything for me. The sensation of breathing under water and the feeling of being weightless were magical.

However, it was the idea that scuba-diving would allow me to venture into the 70% of the world that lies under water that really hooked me.

After I had completed my degree and a short stint in New York as a waitress, I flew to Mexico's Yucatan Peninsula to work on a coral-reef research project. During this time I was invited on a guided cavern-dive – a way for certified divers to experience diving underground without cave training.

I expected to hate it. Yet when I dropped below the surface and pointed my tiny light into the darkness in front of me, I found peace.

Tunnels lined with white stalactites, like Roman columns, stretched into the distance, forking and twisting off into the unknown. The complexity and length of the tunnels was intriguing.

CAVES ARE NOT necessarily dark or confined. With modern dive-lights, there is quite a bit of light down there, and it's shocking how vast most of these places are.

If you're not claustrophobic in a normal room, it's unlikely that you will feel claustrophobic in a cave.

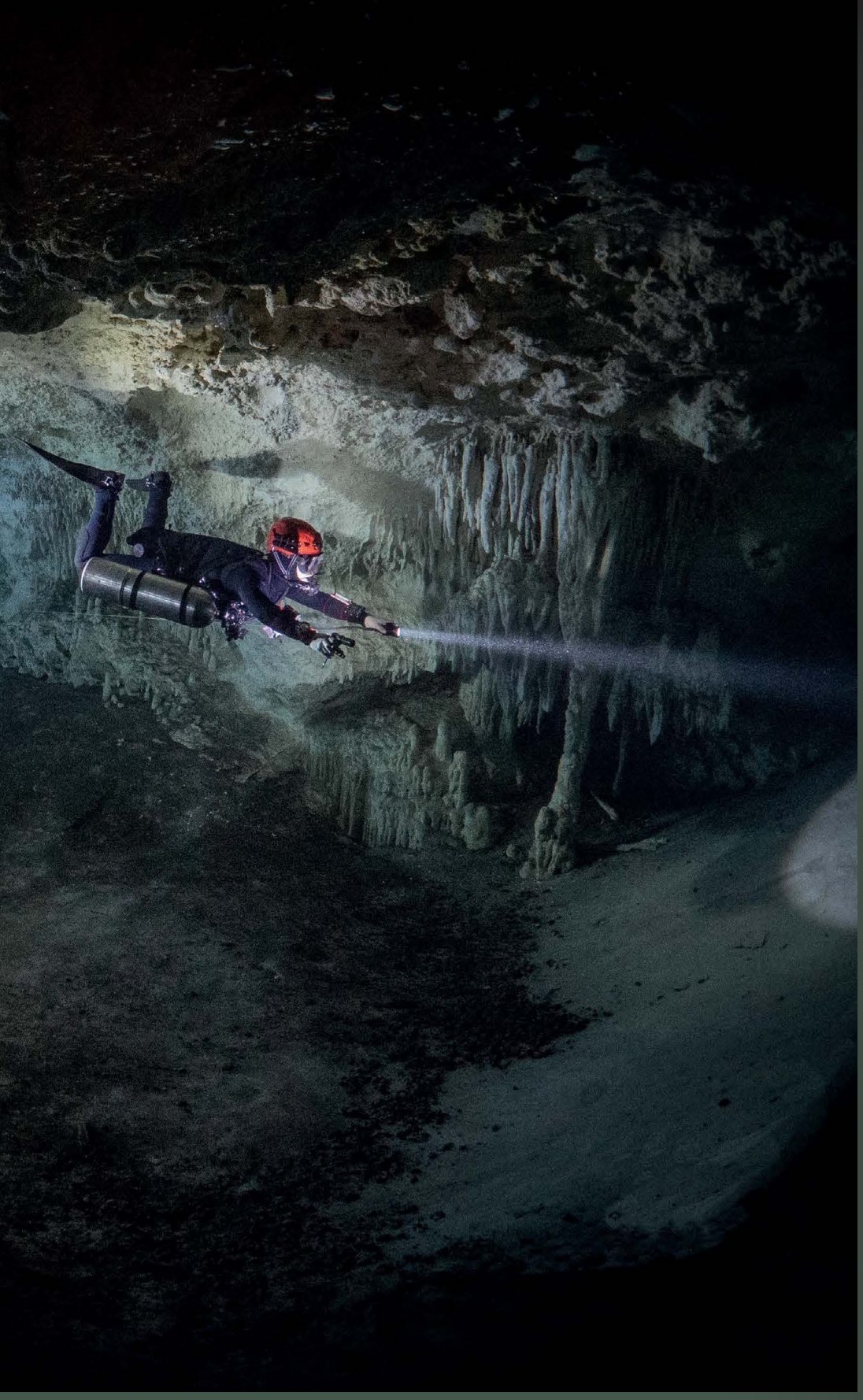
From a training perspective, all cave training starts out in large places with some level of ambient light in the cavern zone, and builds slowly on that. You don't go into tight places immediately, nor do you ever have to. It's a choice divers can make based on their comfort level.

Cave diving shouldn't be about ego, adrenaline, or proving one's worth. It's about control, curiosity, beauty, discovery and,most importantly, about awe – that sense of selfless wonder when you realise that you are such a tiny being on a big, complex planet, in a vast universe that you know so little about.

In 2008 I met Vincent Rouquette-Cathala, my best friend, exploration buddy and now business partner at Under the Jungle. Vince has the same disproportionate drive and adventurous spirit that I do.

We started slowly, exploring caves near my house, but soon had projects going across the Yucatan Peninsula. Together we have been the first people to dive, explore and chart more than 20 new cave systems, and we have surveyed over 80km of previously undiscovered cave passageways.

Some people imagine that being alone in caves would be overwhelming, but that's one



emotion I rarely have.

I have had situations in exploration where I felt that I was reaching my limits, either in skill level or ability to concentrate, but a part of cave diving is recognising the potential for a situation to become overwhelming or dangerous, and leaving before that happens.

An example that comes to mind is a recent set of dives into a cave we named Medusa. I did four dives over the course of about eight hours in one day.

The cave was extremely tight and challenging, with extreme silting conditions and reversing flows. I would go for about half an hour and then turn around and leave, which slowly allowed me to memorise the twists and turns of the cave by feel.

It was like a dance. Kick once with the left foot, turn sideways, pull, duck your head. Kick again. I had to know it by heart to get out.

On the fourth dive of the day, I finally broke out of the tight silty tunnels and discovered the main cave passageway. Even though I had a full reel of line to use in the tunnel, I was mentally exhausted.

I ended the dive when I reached the main tunnel, having made my big discovery for the day, and went back to camp to mentally digest what I had just done.

Staying calm and mentally collected is one of the most important parts of diving. For me, and what I say to my students, is that it's all about breathing.

If you can breathe, you can stay calm and think. Hyper or hypoventilation causes poor oxygenation and leads to stress.

I observe each breath I take and do so mindfully. If I notice that my breathing has changed, it's the first sign of stress or loss of mental focus. I turn the dive there and head out.

MANY SEEMINGLY dangerous things can occur in an underwater cave, although I feel that a physical block to the exit would be the only truly dangerous one for a well-trained cave-diver. Anything else that can happen has a solution.

Gear failures occur – that's a fact of cave-diving. However, we carry back-ups of all our vital life-support equipment, including two tanks, two scuba regulators, back-up lights, reels, line-cutters – anything we need.

We train to switch to the back-ups and leave immediately, so no single gear failure should be stressful or endanger a diver's life.

The same goes for loss of visibility, broken guidelines, and most other situations. These have all happened to me, but it's part of even basic cave-training to manage these situations.

Even total loss of breathing gas in a tank should not be life-threatening. The diver can switch to their other tank and still get out, and additionally teammates have enough gas to donate to them for a safe exit.

It's all about preparation in both gear and training.

I go diving pretty much every day. There are cave-diving communities all around the world, so I would imagine that many are different to ours here in Mexico.

In the past there was a lot of competition and machismo in the sport, but these days in Mexico,

we've worked and I think succeeded in making the community more inclusive and friendly.

Most of the cave-divers here operate from a perspective of conservation and respect for the environment.

I would say that the majority of the divers here frown on adrenaline junkies and machismo because it's not safe, and we want people to live, enjoy the caves and take care of the environment.

All the caves around here differ from one another and I feel very lucky to be able to enjoy such variety.

I have a photo of one of my former students, Hana Cho, swimming close to the surface of a cenote.

A calcite crust forms on the surface of *cenotes* when the water is still and they are untouched. As she swims below the surface, you can see where her bubbles have disturbed the untouched calcite in a series of rings.

Something about the tiny diver starting a dive into the unknown, the emotion of the unexplored, and the peacefulness is captured in that image. It's the beginning of a dive, with all the potential still ahead.

That image sums up my feelings towards diving and I think it's probably one of my favourites – even though Hana's not even in the cave at that point!

Flooded caves are amazing. They never get old or less impressive, and this planet never ceases to surprise.

If I could give any advice to budding explorers – whether divers

or otherwise – it would be to gather as much information about your area of interest as you can, learn local protocols and customs, and find mentors.

Keep in mind that you never explore alone – there are always local people, land-owners, and mentors to give you a solid base. Acknowledge and respect their contributions.

Finally, if someone tells you that something is impossible, you're on the right track. Don't give up! Find a way to prove them wrong.

To read more about Natalie's experiences cave diving, visit discoverinteresting.com/leader-series/diving-in-the-dark

Focus on the now

Divers have many complicated factors to weigh up in choosing overseas trips this year, and some specialist tour operators are proving notably proactive in highlighting realistic destination options for them.

Like other operators, Ultimate Diving has introduced Covid-19 flexible booking conditions so that clients won't have to worry unduly that their deposits are at risk.

However, instead of waiting for the most popular mainstream locations to become accessible without complications, it has been focusing on certain warmwater locations that can be dived in the shorter term.

Long-haul targets as flights and restrictions allow include Barbados, Grenada and Turks & Caicos in the Atlantic/ Caribbean area, while closer to home it is earmarking getaways to Cyprus and Malta & Gozo in the Med.

It is hurricane season in the Caribbean until October/November but towards the south you could be looking at Grenada's highly rated True Blue Bay Boutique Resort with Aquanauts Dive Centre's access-all-areas style – diving both sides of the island – from £1650.

For much the same price room-only (£1685) Ultimate offers the Silver Point Hotel in Barbados. A cheaper option with breakfast is the Palms Resort with its apartments from £1495, and both properties are served by the PADI 5* West Side Scuba Centre.

▸▸ ultimatediving.co.uk

When Spain is back on…

Spain was on, then suddenly off – we hope it will be back on soon. Among the best-rated mainland diving locations there are the Medes Islands, and Ryanair had been serving the Costa Brava from UK regional airports for those unfussed about in-flight distancing.

Hotel & Diving Les Illes, which has been established in L'Estartit for 35 years, says it has a wide range of prices, offers and packages.

Seven-night stay (two sharing) and six-dive packages start from 505 euros pp, and 10-dive packages from 562 euros, depending on the month, and include buffet meals and wine. There is a 5.5 euro fee for dives in the marine reserve, a 10-minute boat-drive away.

▸▸ hotellesilles.com

TAKE-OFF IN THE BAHAMAS

For a while the Bahamas looked to be one of the best long-haul options still available to UK divers, but unfortunately it was taken off the FCO "approved" list just as DIVER went to press.

We hope that changes soon, because the *Bahamas Aggressor* liveaboard was also being relaunched for a maximum of 10 divers per trip, initially with a "Fall Back" offer of US $750 discount.

Week-long trips run to Exuma Cays and south-west Eleuthera through October, and usually seven-day rates are $2795.

▸▸ aggressor.com

Malta makes a good case

Malta, Gozo & Comino reopened to UK visitors without quarantine requirements in July after what appeared to be effective suppression of coronavirus without need of a lockdown, and tour operator Regaldive has been keen to get divers back out to the Med hotspot, working with hotels and apartments that have been Covid-19 certified.

No pre-testing is required for visitors, only thermal screening and a self-declaration form on arrival.

New diving protocols include social distancing in dive-centres, a maximum four divers per group, reduced dive-boat capacity and disinfected rental equipment disinfection (which to be honest we would hope for at any time!), while the underwater environment is said to have benefitted from its break from diving.

The islands are only three hours flight away and the dive-sites, from wrecks of all sizes to topographic shore dives, suit all levels of diver, with Regaldive venturing to nominate Gozo's Blue Hole and Inland Sea, *P29* wreck, Reqqa Reef and St Maria Caves as its top five.

Technical divers especially should also check out its new Virtual Museum of wrecks (*see News*).

Regaldive prices this summer start from £440pp for seven nights at the Sands Apartments, including flights.

▸▸ regal-diving.co.uk

LOOKING FORWARD TO SUNSET

Looking ahead to 2021 when travel to and from the Cayman Islands will we hope be straightforward, the Sunset House Resort on Grand Cayman has a buy-now, check-in later offer whereby divers can buy vouchers for $750 but leave their dates open for the time being.

Their reward will be a $100 discount on the room package, $100 dive credit and $50 food & beverage to spend in the resort.

Seven nights's B&B accommodation (two sharing) with six days of two-tank boat-diving, unlimited shore-diving, transfers and all tax & service charges costs from US $1710pp depending on season.

You also have the option of taking underwater photography classes with Lisa Collins at the site for $65 an hour – a classroom, shore-dive, review/editing class usually lasts four hours.

sunsethouse.com

For that Dorset staycation

Bournemouth Beach Lodges re-opened in early August after lockdown with every other of the 24 self-contained seafront houses welcoming guests at any one time, and they could provide a base for divers holidaying in east Dorset in family or group bubbles. Boscombe beach is on the doorstep and Poole harbour not far away.

Comprehensive Covid-secure precautions are said to be in operation. Normally open all year round, each lodge has a mezzanine-level sleeping area, a central staircase that doubles as shelving, modular furniture and a small terrace for hanging out wet kit. There is a kitchen, shower room, TV and wi-fi and up to four adults and two children can be accommodated.

Bookings start on a Monday or Friday and rates vary through the years, with a four-night midweek stay costing £325-695 and a seven-night stay £700-1390.

bournemouthbeachlodges.co.uk

SO WHERE CAN WE TRAVEL TO DIVE?

The UK Foreign & Commonwealth Office issued a list of destinations exempt from its previous advice against "all but essential" international travel on 3 July, followed later by various extensions and amendments.

This list of "acceptable" countries now aligns more closely with the separate "no-quarantine on return" list drawn up by the Department for Transport for England.

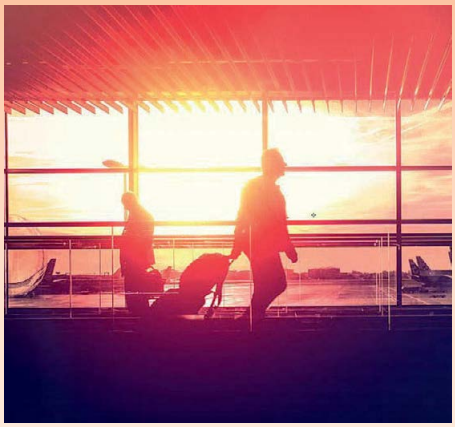
Shown below are listed locations that might be considered as significant diving destinations. Those marked Q2 indicate that two weeks' quarantine would be required either on arrival or on return to the UK.

NDF indicates that no direct flights may be available from the UK; that could be a problem if it means having to transit via a non-compliant nation (eg, the USA).

Each destination has its own testing, screening and certification requirements, check at fco.gov. The list reflects FCO and DfT advice as of mid-August – the situation can of course change at any time.

EUROPE

Croatia
Cyprus



Denmark
Gibraltar
Greece
Ireland (Q2 on arrival)
Italy
Norway
Turkey

AMERICAS

Barbados
Bermuda
Canada (No entry from UK, Q2 on return)
Cayman Islands (No entry from UK)
Cuba (No entry from UK, Q2 on return)
Curaçao (NDF)
Dominica (NDF, Q2 on arrival)
Grenada
St Kitts & Nevis (NDF, Q2 on return)
St Lucia (Q2 on arrival)
St Vincent & The Grenadines (NDF, Q2 on return)
Tobago (No flights until October, Q2 on arrival)
Turks & Caicos Islands

ASIA-PACIFIC

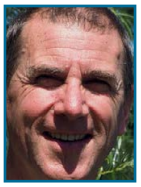
Australia (No entry from UK)
Fiji (No entry from UK)
French Polynesia (No entry from UK)
Malaysia (No entry from UK, Q2 both ways)
New Caledonia (NDF)
New Zealand (No entry from UK)
Sri Lanka (No entry from UK, Q2 on return)
Taiwan (NDF, Q2 on arrival)
Thailand (No entry from UK, Q2 on return)

ATLANTIC

Azores (Portugal) (Q2 on return)
Madeira (Portugal) (Q2 on return)
St Helena (NDF, Q2 on arrival)

WELL AND TRULY TESTED

A sidemount BC, an octo that solves an old problem and a wetsuit not meant for diving – STEVE WARREN and MIKE WARD get stuck in



BC
HOLLIS **KATANA 2 SIDEMOUNT**

MY OLD DIVING CLUB HAD A RULE that buoyancy aids had to be worn on the boats. That was easy enough with an ABLJ, which was worn around your neck like the classic war-movie life-jacket, only with your cylinder on a separate harness so that you could wear the BC without having to wear the cylinder.

However, it was a right pain when stab-jackets came in, because then we had to wear the jacket out to the dive-site, take it off, strap on the bottle, put the jacket back on, now with tank and reg attached, dive, then reverse the operation for the ride back to shore.

Lots of faff, ended only when the committee finally accepted that a drysuit could be described as a buoyancy aid. I remember the meeting well.

I always think of those old club rules when I see a diver in a sidemount BC, because one of these would have offered me a far better solution than an ABLJ – a BC I could have worn all the time, with the bottle or bottles far more easily attached than putting on a conventional backplate-mounted cylinder.

And a pair of sevens would have provided nearly as much gas as the single 15 l usually used, and some useful redundancy too. Not that redundancy had been invented then.

This convenience seems to be gaining traction. I see a lot of dive-guides using sidemount these days, and it's the flexibility they talk about when asked why.

All this passed through my mind when I opened the parcel containing the striking black and red Hollis Katana 2 sidemount BC and unfastened the supplied draw-string storage bag.

I like to see storage bags. I rarely use them, but they suggest that the maker feels that its product is sufficiently high-end to be worth looking after, and the Katana 2 inside fully supported the suggestion.

It was every inch a serious high-spec piece of kit, the sort that feels as if it should deliver efficient, reliable service for years to come.

Longevity isn't something I can test, of course, but on closer inspection the choice of materials, quality of construction and relative simplicity of the design would all give me confidence.

The Design

Classic sidemount BC, the harness leaves your front largely uncluttered, and the inverted-kite-shaped buoyancy cell sits behind your back with the broadest section over your hips.

D-rings for the tops of your cylinders are sited on the front of each shoulder-strap, with elasticated cords fitted to the inside of the harness and attached to clips on the harness to provide additional control of the cylinders.

A butt-plate with oversize-square mounts for the cylinder clips at the centre-rear of the base of the BC.

The Hollis Quick Fit System one-size-fits-all harness is made of 50mm-wide webbing that's nice and thick and should last pretty well forever.

There are no shoulder-breaks, of course, and pretty much every section of every strap and the position of every clip and D-ring can be adjusted until it sits exactly as you want it.

To get started, you move the vertical position of the butt-plate up or down the backplate to set the overall length of the BC, then adjust the shoulder-straps to get it sitting where you want.

Not forgetting to sort the length of the crotch-strap and move the position of the heavy stainless-steel buckle with handsome Hollis logo on the waist-strap left or right so that it sits where you like it.

Next, you move the shoulder D-rings up or down and the butt-plate rings in or out to suit your preferences and you're ready to go, although you'll probably find yourself tweaking the set-up after your first few dives. Kit-fiddlers will love the Katana 2.

Substantial rubber keepers are provided to keep the free ends of webbing under control when you've finished fettling, but there's so much extra length of webbing supplied to fit larger divers that smaller divers like me might well be tempted to cut the excess straps down a bit.

The backplate isn't really a backplate at all, just the rear section of the harness, but it's made from stiff material covered in heavy-duty fabric and features four pockets for weights that sit between the harness and the buoyancy cell running up and down your spine.

Each pocket is generously sized and the four together should swallow enough weight for you to dispense with a belt if you prefer, even in a drysuit. Hollis says they will take 9kg of lead, but I think you could get more in – the 1kg blocks I used didn't come close to filling them.

The buoyancy cell offers 18kg of lift and is inflated using a short direct-feed situated on the left of the BC, so you'll inflate left-handed as you do with other BCs, and the hose comes with an

elasticated cord tied around the inflator and fitted with a bolt-snap.

This allows you to clip the direct-feed somewhere convenient so that you'll always be able to find it when diving.

A short hose is supplied to feed the inflator from your left cylinder. A double-bladder option is available, and a blank on the right of the cell allows a second inflator to be added.

The inner bladder is accessible through a large zip neatly integrated into the inner face of the buoyancy cell, making replacement and cleaning simple, and there are drain-holes at the bottom of the outer cover.

You dump gas from valves top and bottom, with the cord from the centrally mounted top valve routed through a flexible tube running down the edge of the left-hand shoulder-strap to a toggle that's easily found by your left hand.

The bottom valve is mounted out to the left of the buoyancy cell and the cord runs through a small plastic plate to keep it below the level of the cell and more easily accessible.

To prevent the sides of the buoyancy cell floating up and back around your cylinder there's a cord on either side of the cell, so you can pull it forward and round your body if you like.

Look again and you'll see more D-rings and loops. The waist-belt has a D-ring either side; there's one at the front and rear of the crotch-strap; and two loops of heavy-duty fabric are sewn into the inside of the buoyancy cell high up.

And there's more, with a plastic bag in which you'll find a sternum-strap and more D-rings, T-sliders and quick links. When you come to set up your Katana 2 you won't be short of options.

In Use

None of which matters if the BC doesn't deliver in the water, of course, and I dived the BC with a pair of sevens, a single steel 12 and a mismatched pairing of a steel 12 and steel 15, the heaviest cylinders I had available.

The paired sevens were lovely to use. I carried them to the water's edge, got my mask rinsed and fins on, then clipped them on without effort just before I strode into the water.

Seconds later I was hovering a couple of feet off the bottom, rock-solid stable.

I'll fess up and say that I forgot about testing for a bit after that and just went for a swim around to look at the fish, which is about the highest compliment I can pay to any diving gear.

When I remembered why I was supposed to be there, I found forward and backward rolls and head-down and head-up positions equally easy to complete or hold.

Even barrel-rolls weren't too clumsy with those little sevens, especially when their necks were in the firm grasp of the elasticated cords provided for the purpose.

In a proper horizontal trim the upper dump-valve was all I needed, allowing all the air in the bladder to escape without any frantic wriggling around.

This was good, because the lower valve was much more dependent on my position in the water for gas to escape. I hardly used it, and would have preferred it to be more central and on the outer face of the bladder with the dump-cord to the right, so that I could use either dump while horizontal and selecting whichever hand was free. However, it's worth noting that the upper valve-dump can be accessed by either hand.

Go upright and the upper dump would keep pace with the inflate, so in a fan/poo situation there's a decent chance of keeping things under control.

Bigger dump-valve toggles would have been much easier to find with gloves on. Checking post-dive showed no water ingress into the bladder.

Switching to the single steel 12 I felt, predictably, a bit lopsided, but the Katana 2 was more than up to the job, as it was with the 12/15 combination. Even with that heavy final combo the harness was reasonably comfortable out of the water. Post-diving it all dried quickly, which is always useful.

As a final trick, the Katana 2 is also designed to take the KISS Sidewinder CCR if that's your thing.

Conclusion

Overall, then, if you want a sidemount BC the Hollis Katana 2 will more than get the job done. Lower dump-valve excepted, it's a high-quality piece of kit. ■

Rear view shows the cords to control the wing's outer edge.

SPECS

TESTER ▸▸ **Mike Ward**
PRICE ▸▸ **£530**
WEIGHT ▸▸ **3.5kg**
LIFT ▸▸ **18kg**
COLOUR ▸▸ **Black and red**
CONTACT ▸▸ **hollis.com**

REGULATOR
SCUBAPRO **R195 / MK25 EVO**

LEFT OVER RIGHT, OR RIGHT OVER LEFT?

From which side do you prefer to run your octopus? It's a contentious issue, assuming that you use a right-handed, conventional puck-shaped safe second, rather than an ambidextrous side-exhaust regulator.

If you lead it from the right, the mouthpiece faces towards you. Those who prefer to run their octopus this way argue that they can easily use either of their second stages themselves.

They accept the tendency of the safe-second hose to catch on their mask or reg or interfere with eye contact when face to face. This is because the hose has to loop back on itself between the two divers' faces in order for the sharer to receive the octopus the right way up.

Lefties argue that the octopus is only for sharing, so it is easier to donate and for your buddy to use it if you run it over or under your left arm, because you don't have to kink the hose to pass it off.

This also means that the hose routes away from both divers, rather than between them, and is less likely to interfere with your vision as you ascend face to face.

In effect, the lack of a kink also means that there's more hose to play with, so you can keep a little more distance between you.

Offered from the left, the mouthpiece naturally faces your buddy and is the correct way up for them to use. The downside is that if the casualty takes your primary, you'll have to bend the safe-second hose to put it into your own mouth the right way up.

Both camps cite merits. I used to teach students using safe seconds built into their BC direct feed, which requires you to surrender your primary to an out-of-air buddy. They never had an issue donating the "right" way.

Technical divers also favour the right-side configuration, giving up their primary and switching to a back-up secured around their neck. It's worth trying different configurations to see which you prefer.

But bear in mind that it's a stretch to assume that a panicked, out-of-air diver, even your best friend, is going to take the safe seconds you specified during your exhaustive buddy check. So, whichever set-up you choose, you'd better be prepared to improvise.

Even after making your choice, you might still be compromised by the layout of your first-stage ports. With one of my regulators, I have too few ports to run my safe second from the right, which is my own preference.

Scubapro's R195 second stage gives you a lot of flexibility to lay out your safe second or a primary reg whichever way works best for you. It does this through a hidden feature – you can run the hose from the usual right side of the R195, or have a technician switch it to the left.

I used to dive independent single cylinders a lot, which requires you to monitor two pressure gauges and switch regulators regularly. It's nice to be sure that you're breathing from the tank you think you are. There have been enough incidents in which divers got this wrong.

A classic involved a saturation diver working from a scientific underwater habitat, so very highly trained indeed. By accident, he started his dive breathing from his pony bottle's second stage, which came over his right shoulder, like his identical primary.

He soon ran out of air, spat out his mouth-piece and reached, logically, for his pony reg, assuming that his primary regulator had failed and caused the air stoppage...

When I first dived with independent singles, I rigged one pressure gauge under my left arm, the other under my right, matched to the corresponding cylinders to prevent confusion.

My regs, however, were both right-handers. I had to use that brand because it was the one the shop I then worked for was pushing.

I chose differently shaped second stages so that I could tell them apart by touch. But I'd have preferred to run one regulator over my left shoulder rather than both over my right.

It would have further reduced the scope for a schoolboy error when task-loaded by my camera, or narked.

For other multi-tank set-ups such as sidemount diving and using stages, left-hand regulators are often essential. If you don't like side-exhaust regulators, the R195 provides a conventional and inexpensive solution.

The Design

The R195 is Scubapro's entry-level second stage. Compared to others higher up the range, it lacks pneumatic balancing, the feature that reduces cracking effort, making inhalation a little easier.

It also lacks a control to adjust the cracking effort, something I wouldn't miss myself. It does have a pre-dive switch to stop freeflows when it's out of your mouth.

At face value, this is a very straightforward classic downstream second stage. But look a little deeper, and you'll find some extra niceties.

For a start, it meets the EN250 standard for coldwater diving, so has been tested in fresh water at 4°C. It also has a wide-bore, high-flow hose for easy breathing.

The technopolymer casing keeps it light, rugged and corrosion-proof. It's rated for nitrox mixes to 40%, so is good for casual nitrox diving as well. For those using oxygen deco mixes up to 100%, Scubapro offers the nitrox version of the R195, coloured green for easy identification.

In Use

The R195 is comfortable on your jaw and the exhaust deflector does a good job of leaving your field of view largely clear of bubbles. Insert it upside-down and you can blast-clear it easily.

The purge works well with or without gloves. But the main question is: how well does it breathe?

With former Navy diver Dennis Santos I tested the R195 octopus on a heavy-breathing exercise to test a Mk25 Evo / 620Ti regulator's ease of breathing in a sharing scenario. We took the regulator to 30m, both grabbed a second stage, held onto a piece of wreckage and finned like crazy to get our respiration rates as high as possible.

The Mk25 Evo is a high-performance balanced piston first stage, and it was no surprise that it functioned so well. Dennis used the R195 second stage and concluded that it performed perfectly, despite the workload.

Unlike some safe seconds, the R195 octopus differs from the standard R195 only in terms of having a yellow front cover and hose for easy identification. It isn't detuned.

Scubapro uses hoses with standard 3/8th fittings but with wide internal bores designed to support high flow rates. The hoses aren't as supple as those of many competitors, so they don't coil up as nicely for storage. The standard hose is 75cm long, the octopus hose 1m.

The Mk25 Evo first stage was reviewed in detail in the July 2020 issue. Suffice to say it is EN250A-rated, so has been certified to the limits of EN testing – 50m for a single diver and 30m with two breathing from it simultaneously using a primary and safe seconds. I assume that it outperforms these limits by some margin.

The Mk25 Evo is designed for coldwater use, meeting the EN specs for fresh water at 4" like the R195. Along with a high-pressure port on either side for an SPG or pressure transmitter, it also has five mp high-flow ports, four on a swivel turret and the fifth leading straight off the piston.

This arrangement complements the R195, allowing easy configuration regardless of whether you use the R195 left- or right-handed.

The R195 can be partnered with any current Scubapro first stage, providing a wide choice of unbalanced, balanced-piston and balanced-diaphragm models to suit needs and budget. All combinations meet the EN250A standards for coldwater diving and sharing using an octopus.

You can choose yoke, normal DIN or the unloved M26 DIN fittings used with Scubapro's 100% oxygen-prepped models.

This is an EU thing, legally required for nitrox mixes exceeding 22%, and you can ignore it.

Conclusion

The R195's selling point for many recreational divers and dive-centres will be its low cost and that it comes with Scubapro's support and reputation. But for some advanced divers and many technical enthusiasts, being able to set it up for left-handed use will be very persuasive.

Crucially, the R195 is also a nice breathe. Recommended. ■

SPECS

TESTER ▸▸ **Steve Warren**
PRICE ▸▸ **£150, octopus £162, nitrox octopus £189, MK25 Evo £315**
SECOND STAGE ▸▸ **Downstream**
CERTIFICATION ▸▸ **EB250A with Scubapro first stage**
O2 COMPATIBILITY ▸▸ **40%, nitrox model 100%**
HOSE LENGTH ▸▸ **75cm, octopus 100cm**
WEIGHT ▸▸ **500g, Mk25 Evo 570g**
CONTACT ▸▸ **scubapro.com**

WETSUIT
LOMO **VENOM 5MM**

LAST YEAR I STARTED TO COMMUTE BY BICYCLE. After two or three months I'd improved my overall fitness and lost some weight, and even saw a reduction in my gas consumption.

In this year's lockdown I was making a working-from-home cycle commute each morning to keep the improvements going, and I'm now a full 10kg lighter than I was.

I mention this only because Lomo recently sent me its Venom wetsuit to try, and I was grateful for both the fitness and the weight-loss when it came time to put it on. About which more shortly.

First, however, the suit itself, which comes in a tasteful black and orange combination that I found very easy on the eye. I'm not that bothered by colour choices, but I liked this.

And, bonus, it's effectively pre-faded.

The suit is made from a combination of 3, 4 and 5mm thicknesses of super-stretch 100% CR neoprene, glued and double-blind stitched. The stitching was exemplary on my sample.

The various thicknesses of neoprene are chosen to provide a balance of warmth and freedom of movement by matching panels to the amount of bending and stretching that might be needed, with no under-arm seams for extra comfort. Armaprene panels, which Lomo claims are as stretchy as the rest of the suit but have 10 times the abrasion resistance, reinforce the knees.

This stretchiness and ease of movement thing is especially important in the Venom because it isn't CE-certified as a scuba-diving suit.

It's sold for surface watersports such as surfing, stand-up paddle-boarding and wild swimming, where bending and stretching occur far more frequently than in scuba-diving.

Lomo warned me that I really didn't ought to dive in a non-diving-certified suit, but being an adrenaline junkie and a rebel committed to living life on the very edge, I decided to chance it.

The Design

The Venom is back-entry. The sides of the suit effectively cover the run of the zip when shut and a generous flap at the top is secured with a Velcro tab to keep the collar as tight as you like.

The zip is a substantial affair, though it seemed a little shorter than I would have expected. When I pulled it down it revealed a semi-plush lining that promised to deliver comfort when wearing the suit out of the water.

It also revealed an internal bib that provides an extra barrier to water entry via the zip. Lomo calls this a batwing panel and it's attached to the inside of the rear of the suit below the zip, explaining the relatively short zip.

Any water coming through the zip is prevented from reaching your skin by the panel and directed back out through a pair of small drain-holes, reducing heat loss from flushing.

And that's it for features. You could call it basic, if you like, though I prefer minimalist.

Donning

Time to try it on, and my overwhelming first impression was that the material really is stretchy. Very stretchy. My second impression was that when Lomo sizes a suit it doesn't mess about being over-generous. If I hadn't lost those 10kg, I might have struggled to get into the medium version I'd been sent.

As it was, it still took considerable wriggling and tugging, especially to get the arms and legs pulled all the way up, there being no ankle- or wrist-zippers to help. That's when the extra fitness helped. I think a week's liveaboard would leave me with sore fingers from pulling the suit on.

Then I found that the bat-wing panel was a bit too far down my back to reach easily, and I had to resort to looping a length of cord through the neck to pull it up far enough to grab, though once pulled over my head it settled into place fine and was nice and comfortable.

Then I discovered that the ribbon attached to the zipper was a bit short, so wasn't easy to manoeuvre into place to pull upward to zip the suit up. Zipping it myself was tough, requiring some extra pulling and tugging at the top of the suit to pull the sides of the zip close enough together for the zip to do its job.

Both issues might be me that's not as flexible as I'd like, of course, and I could have just asked my buddy for help, in which case no such issue would have arisen.

I also had a bit of a struggle with the Velcro on the collar attaching itself to the lining of the suit.

All of which might put you off, but once the suit was on it conformed to my manly physique like a second skin and was as comfortable to wear as my own skin out of the water.

Seriously. I've never worn a more comfortable wetsuit topside. Kitting up was as easy as if I was doing it in the T-shirt and shorts in which I'd driven to the dive-site.

In Use

Time, then, for the ultimate test, and because of the unique circumstances in which we've found ourselves this year I was about to leap into a UK inland site in a 5mm-or-less wetsuit. I hope you appreciate the dedication.

As you'll all know, the most important thing about any wetsuit is that it fits like a second skin, hugging your body contours to prevent water flushing through and taking core heat with it.

All the while I'd been struggling into the suit I'd been telling myself that the tight fit would mean limited flushing and that all the effort would be worthwhile – and it was.

The water averaged 17°C, with some colder patches and some warmer patches, and 50 minutes of dive-time later I was still comfortably warm and could climb out of the water happily anticipating a second dive later in the morning.

I mentioned the colder patches, and it was in those that I was most impressed by the Venom.

I felt the thermocline on my hands and feet, but not my body core. I wouldn't want to be in water very much cooler, to be fair, but my usual "switch to a drysuit" temperature is 20°, so the Venom was doing a good job.

How good was demonstrated clearly when I got back to the car and unzipped the suit. Yes, there had been some water ingress at the neck and the ankle and wrist-cuffs, but I've honestly had wetter dives in a drysuit.

Conclusion

I liked the Venom. It's basic, and was, admittedly, tough to put on, but that's the only real downside I can think of. The comfort and warmth delivered more than balanced it out, though four dives a day for a week might make me reconsider. But probably not given a price of just £99. ■

SPECS

TESTER ›› **Mike Ward**
PRICE ›› **£99**
WEIGHT ›› **1.25kg**
COLOUR ›› **Black and orange**
SIZES ›› **7, S-3XL**
CONTACT ›› **lomo.co.uk**

NEW BUT UNTESTED

The latest kit to hit the dive shops

Shearwater Peregrine Computer ▲▲▲▲

New from Shearwater Research is the £448 Peregrine computer, designed to attract recreational divers with user-friendly and progressive features including customisable displays. Although it's Shearwater's entry-level model, the Peregrine not only handles air or single-mix nitrox but can be used with up to three bottom and deco mixes, including 100% oxygen.

shearwater.com

Mares Psycho Calavera BC ▲▲▲▲

The Psycho Calavera single-tank wing might be heavy duty but it weighs only 2.7kg. From the Mares XR extended-range line, the doughnut-shaped air-cell provides 16kg of lift. There's an aluminium backplate and alloy buckles secure the dual tank-bands. An array of D-rings is provided for neat management of accessories. The price is £539.

mares.com

AOI Mirrorless Housings ▶▶▶▶

Olympus has announced that it is stopping making cameras after 84 years, but the brand was popular with divers so there are a lot out there. AOI is making 45m-rated polycarbonate housings for Olympus Pen mirrorless cameras. There's a built-in flash trigger and a choice of wide-angle and close-up wet lenses or ports for land lenses. Housings with ports start at £725 and include an anti-flood vacuum-tester. The cameras cost from £399.

nautilusdiving.co.uk

Oktopus Moonlite Watch ◀◀◀◀

The Oktopus Moonlite luxury timepiece is crafted from a unique metal, Alloy Linde Werdelin. This is claimed to be twice as strong as steel and half the weight of titanium, and is used in aerospace and Formula 1 engineering. Along with normal time-keeping functions, including one-way bezel, the 25-jewel automatic watch displays the phases of the moon, which is useful for tracking tides. Moonlight becomes you for a cool £13,200.

lindewerdelin.com

Paralenz Vaquita Action Cam ▼▼▼▼

The Paralenz Vaquita can be mask-mounted for point-of-view video or aimed using the built-in OLED monitor. This action cam shoots 4K video at 60fps or 240 super slow-mo at 1080. You can also take 12MP RAW stills pictures. The Vaquita automatically adjusts colour balance as you change depths, says Paralenz. It's 350m-rated, and even has a Gauge mode showing depth and dive-times in the viewfinder. The price is 749 euros.

paralenz.com

Keldan Colour Checker ▸▸▸▸

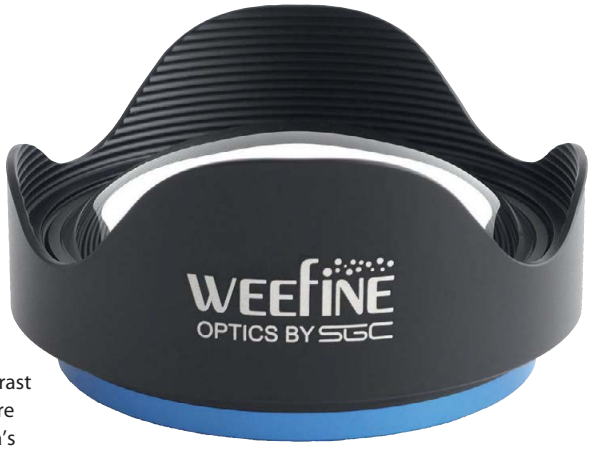
Learn from the professionals and don't rely only on a simple manual white-balance setting to get the results you want. The Colour Checker is a cinematographer's tool used to calibrate hues under changing light conditions to ensure that colours can be accurately matched in post-production, even with multiple cameras. Keldan's £125 version goes under water with you and has a grey colour-balance slate on the reverse.

▸▸ **keldanlights.com**

Nanight 190Wh Dual Power Canister ◂◂◂◂

This new lithium-ion powerpack would allow a diver to operate a powerful exploration light and a heated undersuit simultaneously. It offers four power levels for your divewear and one for the lamp-head and features an aluminium body with hi-use wet connectors. The price is 620 euros plus VAT.

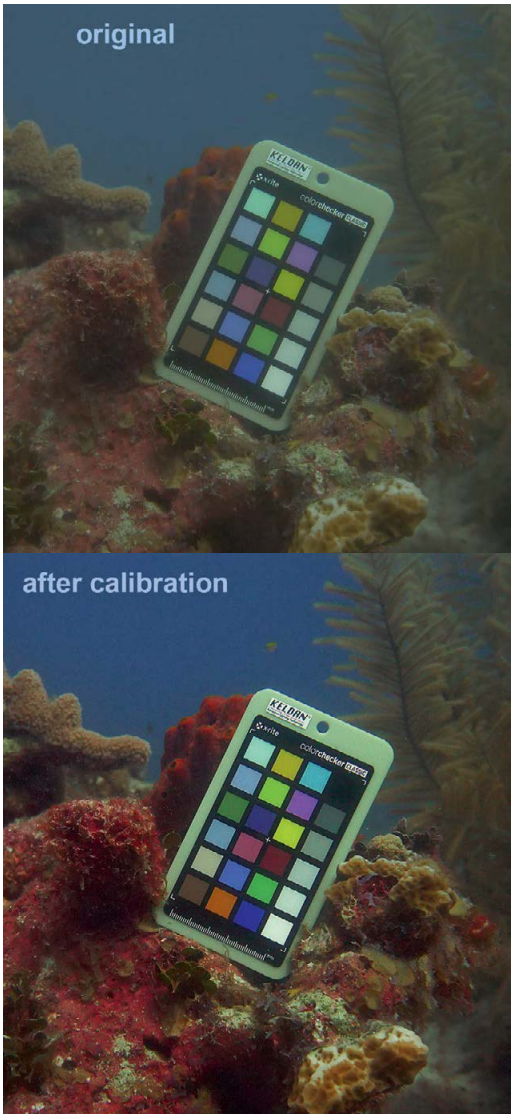
▸▸ **keldanlights.com**



Weefine WFL-11 & 12 Dome Ports ▸▸▸▸

Looking to take in a wider view or get closer with your compact or mirrorless camera? Doing so should improve sharpness, contrast and colour. These dome-ports are intended to restore your camera's original wide-angle field of view to its surface value, and can be fitted and removed under water. A version for Olympus Tuf housings costs £189, or an M67 model costs £205.

▸▸ **mikesdivecameras.com**



MALCOLM NOBBS

NEXT ISSUE

European Road Trip
Brakes off in Sweden as the pandemic takes hold

Mission Iceberg
A photographer on scuba, a freediver & wild Greenland

Secret Santander
Not the Spanish port – this one's in the Philippines

The World Beneath
Seeing things differently with Richard Smith

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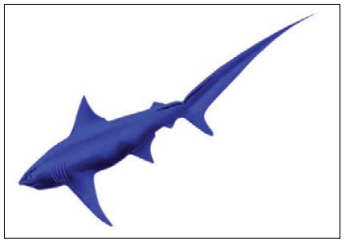

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www.channeldiving.com Midweek diving for individuals. Tel: 07970 674799. (73330)

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Lymington - "Wight Spirit". Diving West Wight, East Dorset, English Channel. Beginners to technical and small groups. Electric lift. Easy access, easy parking. Owner/skipper Dave Wendes. Tel/Fax: (023) 8027 0390, e-mail: wightspirit@btinternet.com www.wightspirit.co.uk (70252)

Dive Littlehampton "Final Answer". Shallow to deep, we cater for all. Skipper and crew on board, availability 7 days a week. Maximum 10. Tel: (01243) 553977 or 07850 312068. Email: ourjoyboat@gmail.com www.ourjoy.co.uk (73415)

South West

Venture Dive Charters. For quality diving from Plymouth, visit: www.venturecharters.co.uk or Tel: 07948 525030. (73533)

DIVING MEDICALS

Diving Medicals - Nottingham. Sport Diving medicals: £55. HSE Commercial Diving medicals: £120. OGUK Offshore medicals: £110. HGV/PSV medicals £55. Student and Group discounts. Combine any two medicals and pay only £5 extra for the cheaper of the two. Tel: 07802 850084 for appointment. Email: mclamp@doctors.org.uk(70407)

Diving Medicals - Midlands (Rugby) - HSE, Sports Medicals and advice at Midlands Diving Chamber. Tel: 01788 579555 www.midlandsdivingchamber.co.uk (72756)

CLUB NOTICES

FREE OF CHARGE. (Max 25 words). Non-commercial clubs, no sales.

Arnewood Divers, Christchurch - where diving is safe and fun from our own hard boat. Training from beginner to Instructor. Find us on Facebook or https://sites.google.com/view/adsac/home

Active and friendly BSAC club. All year diving in local lake. New and qualified divers of all agencies welcome. Own clubhouse with 7m RIB and compressor. For further information visit www.mksac.co.uk (64403)

Alfreton (Derbys) BSAC 302. Welcomes new members and qualified divers. A small but active club with own RIB, wreck diving a speciality. Contact Angela on 07866 799364. (68370)

Appledore Sub-Aqua Club (SAA 35) Friendly club welcomes experienced divers from all agencies . Regularly dives Lundy island , own hard boat / compressor . Contact Damian 07831 152021.

Banbury SAC. Friendly, active club with weekly meetings and training sessions, own boat, compressor and equipment. Welcome divers/non-divers. www.bansac.org or call 07787 097 289. (69308)

Birmingham Underwater Exploration Club. Friendly, active dive club. Weekly pool sessions. Regular trips. Own RIB based in south Devon. Training and equipment loan available to members. Tim 07775 580033.

Bracknell Sub Aqua Club welcomes new and experienced divers from all agencies. Meets poolside at Bracknell Sports Centre, Thursdays from 8.30pm. Diving, training and social calendar: www.bracknellscuba.org.uk or tel: 07951 855 725. (65792)

Braintree Riverside Sub Aqua Club based in Braintree, Essex. A friendly club, we welcome divers of all abilities and have an active diving and social programme. Come and join us! email: denise.f.wright2@btinternet.com www.braintreeriversidesac.co.uk (69397)

Bromley/Lewisham Active divers required. Full programme of hardboat diving throughout the year. Check out Nekton SAC www.nekton.org.uk or contact Jackie (01689) 850130. (68537)

Buckingham Dive Centre. A small friendly club welcoming all divers and those wanting to learn. We dive throughout the year and run trips in the UK and abroad. www.stowe subaqua.co.uk Tel: Roger 07802 765366. (69433)

Chelmsford and District SAC meet at 8pm every Friday at Riverside Pool. New and qualified divers are welcome. See our website for details: www.chelmsford diveclub.co.uk (68620)

Cockleshell Divers, Portsmouth, Hants. Small, friendly club welcomes new and experienced divers from all agencies. Meets at Cockleshell Community Centre, Fridays at 8pm. Email: cockleshell.divers@aol.co.uk (64762)

Colchester Sub-Aqua Club welcomes experienced divers and beginners. Sub-Aqua Association training. Diving at home and abroad. Meets at Leisure World Friday evenings. Contact Tony (01787) 475803. (68263)

Chingford, London BSAC 365. Friendly and active club welcomes divers from all agencies and trainees. Meet Wednesday 8pm, Larkswood Leisure Centre E4 9EY. Information: www.dive365.co.uk Email: loughton divers365@gmail.com (69208)

Cotswold BSAC, a friendly club based at Brockworth Pool, Nr Cheltenham, Fridays 8pm. Regular inland diving and coast trips. Tel: 07711 312078. www.cotswoldbsac332.co.uk (68577)

Darlington Dolphins Sub Aqua Club, small friendly BSAC/PADI, open to new and experienced divers. Meet Friday night in Dolphin Centre at 8.30. Tel: 07773 075631 or email robkilday@hotmail.co.uk (72665)

Darwen SAC, in Lancashire, with an active diving programme. Own RIB. new members welcome regardless of agency/training. We provide BSAC training. Weekly pool sessions. www.darwensac.org.uk (69161)

Dream Divers. Very friendly dive club in Rotherham welcomes divers of any level/club. Meet at the Ring O Bells, Swinton, last Thursday of the month at 19.30. Email: info@dreamdiversltd.co.uk (69699)

Ealing SAC, BSAC 514. Friendly, active club, own RIBs; welcomes new and experienced divers. Meets Highgrove Pool, Eastcote, Tuesday nights 8.30pm. www.esac.org.uk (68413)

East Cheshire Sub Aqua. Macclesfield based BSAC club. Purpose-built clubhouse, bar, two RIBs, minibus, nitrox, compressor. Lower Bank Street, Macclesfield, SK11 7HL. Tel: 01625 502367. www.scubadivingmacclesfield.com (65609)

East Durham Divers SAA welcome new/experienced divers of any agency. Comprehensive facilities with own premises half a mile from the sea. Contact: John: 07857 174125. (68663)

East Lancs Diving Club based in Blackburn. Friendly, active club welcomes new members at all levels of diving from all organisations. Tel: 07784 828961 or email: ELDC@hotmail.co.uk www.eastlancsdivers.co.uk (69411)

Eastbourne BSAC; RIB, Banked air (free) to 300bar, Nitrox, Trimix. Enjoy some of the best diving on the South Coast, all qualifications welcome. www.sovereigndivers.co.uk (65695)

Eastern Sub Aqua Club SAA 1073. We are a small friendly dive club and welcome new and experienced divers alike. We are situated north of Norwich for training. For more information please see out website: www.esacdivers.co.uk (65879)

Ellon Sub Aqua Club, Aberdeenshire, welcomes newcomers and experienced divers. We dive year round and meet on Thursday evenings. Contact www.ellonsubaquaclub.co.uk (65523)

Fife Scuba Divers Tel: 07575 372575. www.fifescubadivers.com. SAA Club No203. Meetings: Thu 19.30, 81 East Way, Hillend, KY11 9JF. Training Club, Crossovers welcome. (72380)

Flintshire Sub Aqua Club based in Holywell, Flintshire, welcomes new and experienced divers from all agencies. Full dive programme. Meet Wednesdays. See us at www.flintsac.co.uk or call 01352 731425. (64293)

Guildford BSAC 53. Welcomes new and qualified divers. Friendly, active club with 2 RIBs, compressor, Nitrox, meets Tuesday at clubhouse with bar. www.guildford-bsac.com or call 07787 141857.

Hartford Scuba BSAC 0522, based in Northwich, Cheshire. A friendly, active diving club. Compressor for air and Nitrox fills. RIB stored in Anglesey. www.hartfordscuba.co.uk (67287)

Hereford Sub Aqua Club, is looking for new members. Regular diving off the Pembrokeshire coast on own RIBs. Training and social nights. Contact: rusaqua@googlemail.com (69146)

HGSAC. South Manchester based friendly, non-political club welcomes newcomers and qualified divers. Lots of diving and social events. Family. Three RIBs and compressor. www.hgsac.com (68501)

High Wycombe SAC. Come and dive with us - all welcome. Active club with RIB on South coast. Contact Len: 07867 544 738. www.wycombesubaqua.com (69131)

HUGSAC - BSAC 380. Experienced club, based around Hertfordshire, with RIB on the South coast. Members dive with passion for all underwater exploration. All agencies welcome. www.hugsac.co.uk (63275)

Ifield Divers. Crawley-based club. Twin engine dive boat with stern lift in Brighton Marina.Training for novices, diving for the experienced - all qualifications welcome. www.ifield-divers.org.uk Email: info@ifield-divers.org.uk or tel: 01883 731532. (64514)

Ilkeston & Kimberley SAA 945, between Nottingham and Derby, welcomes beginners and experienced divers. We meet every Friday night at Kimberley Leisure Centre at 8.30pm. Contact through www.iksac.co.uk (68559)

K2 Divers, covering West Sussex/Surrey. A friendly BSAC club, but all qualifications welcome. Training in Crawley, boat at Littlehampton. Email: k2divers@yahoo.co.uk or tel: (01293) 612989. (68335)

Kingston BSAC, Surrey. Two RIBs , clubhouse and bar, active dive programme, two compressors, Nitrox, Trimix, full training offered at all levels. All very welcome. www.kingstonsac.org or tel: 07842 622193. (69176)

Lincoln - Imp Divers. Small, friendly, non-political diving club with our own RIB are looking to welcome new and experienced divers. Contact Richard: 07931 170205. (69383)

Lincoln and District BSAC. Active club with own RIB, compressor and other facilities. Regular trips and training. www.lincolndivingclub.co.uk (69336)

Lincs Divers BSAC 1940. Friendly, active dive club offering dive trips and training for new/experienced divers. Lincoln based. www.lincsdivers.co.uk

Llantrisant SAC, two RIBs, towing vehicle, welcomes new and experienced divers. Meet at Llantrisant Leisure Centre 8pm Mondays. Contact Phil: (01443) 227667. www.llantrisantdivers.com (68519)

Lutterworth Dive Club, active, social, friendly. Own RIB, regular trips. Welcomes qualified divers, any agency. Training at all levels. Most Tuesdays, Lutterworth Sports Centre. www.lsac.co.uk (70043)

Leeds based Rothwell & Stanley SAC welcomes new and experienced divers, full SAA training given. Purpose built clubhouse with bar, RIB, compressor. Meet Tuesday evenings: 07738 060567 kevin.oddy@talktalk.net

Mansfield and District Scuba Diving Club. www.scubamad.co.uk. Sub Aqua Association - club 942. 8 Beech Avenue, Mansfield, Notts. NG18 1EY. (71643)

Manta Divers. Norfolk wreck & reef diving. Small, friendly, experienced club. All agencies welcome. SAA training. www.mantadivers.org (64088)

Mercian Divers (BSAC 2463) Active & Friendly club. New, experienced & junior divers welcome. Own RIB. Based in Bromsgrove, West Midlands. Tel: 01905 773406 www.mercian-divers.org.uk (65391)

Merseydivers (BSAC 5) Friendly & active club with 2 RIBs & Compressor/Nitrox/Trimix. Meeting every Thursday 7pm till late. All divers welcome. www.merseydivers.com or call Steve on 07570 015685.

INSURANCE

Merseyside training club, new and active divers from all agencies, weekly pool session. Own Rib towing vehicle Contact www.wapsac.org.uk or wapsacsac@gmail.com
Millennium Divers. Active, friendly club for all levels and certifications of diver, based in Portland, Dorset. UK diving and holidays. Club social nights www.millenniumdivers.org (68351)
Mole Valley Sub Aqua Club. Surrey based SDI club, own RIB, active diving UK & Abroad, training and social events. Trainees/crossovers welcome. Contact: 07410 949268 or email: info@mvsac.org.uk (68691)
Monastery Dive Club (Dunkerton Branch). New divers welcome to join our club. Trips to Plymouth and NDAC. GSOH is a must. South Wales area (Crosskeys, Risca.) Text: Flinty 07971 432803 or email: welshflinty@hotmail.com (65305)
Nekton SAC. Based in Bromley, we are a friendly and active SAA Club that welcomes experienced and new divers alike. Info@nekton.org.uk or call Steve: 020 8467 4599. (68387)
Nemo Diving Club. Small friendly dive club offering dive trips and training for non/experienced divers in Retford and surrounding areas. Contact: www.nemodiver training.co.uk (69640)
North Wales Sub Aqua Club. Llandudno based and open to new and experienced divers. Fun, friendly and active SAA affiliated club. Training every weekend. www.nwsac.wales (70688)
North Glos BSAC 80. Friendly, active club welcomes new and experienced divers. Own boat and equipment with weekly pool sessions, Thursdays, 8.30pm at GL1 Gloucester, (Gloucester Leisure Centre). www.nglos.co.uk (68483)
Nuneaton. Marlin BSAC welcomes experienced divers to Pingles pool every Thursday. Active training, diving, social programme in a flourishing club with no politics allowed. www.marlinsac.com (69322)
Orkney SAC. Small, friendly active dive club, based in Kirkwall, welcomes divers of any level or club. Own RIB and compressor. Contact Craig: 07888 690 986 or email: craigbarclay31@hotmail.com (69735)
Plymouth Sound Dive Club welcomes qualified and experienced guest divers. See www.plymouthdivers.org.uk for more information/weekly club notices. Contact relevant dive manager or divingofficer@plymouth divers.org.uk to join a dive . 72219)
Preston Divers SAA 30. The friendliest dive club. Come and meet us at Fulwood Leisure Centre, Preston on Monday nights between 8.00pm - 9.00pm. www.prestondivers.co.uk (64198)
Reading Diving Club. Experience the best of UK diving with a friendly and active club. All welcome. Tel: 01183 216310 or email: info@thedivingclub.co.uk www.thedivingclub.co.uk (69447)
Reading Sub-Aqua Club (BSAC 28). Active, friendly, based Palmer Park. Clubhouse, licenced bar, compressor, 2 RIBs. Club night Thurs, all grades/agencies. Training to Adv Diver +. rbsacinfo@gmail.com www.rbsac.org.uk Tel: Colin 07939 066524. (72402)
Richmond Sub-Aqua Club (Surrey) welcomes new and experienced divers. Very active diving, training and social calendar for about 100 members. Contact: contact.rsac@gmail.com, www.richmondsubaqua.club, 07843 959 775.
Robin Hood Dive Club. Yorkshire based and one of the most active in the country with a full 2019 calendar of trips. All agencies and grades welcome. No training or pool, just a growing bunch of regular divers. www.robinhooddiveclub.com or find us on Facebook. (59245)
Rochdale Sub-Aqua Club. Beginners and experienced divers welcome. Full training provided. Pool session every Wednesday. Club has two boats. More info at www.RochdaleDivers.co.uk or call Mick 07951 834 903. (65103)
Ruislip & Northwood BSAC. Friendly, active club, RIB, welcomes new and qualified divers. Meets Highgrove Pool Thursday nights 8.30pm. www.rnbsac.co.uk Tel: 07843 738 646 for details. (69469)
Scotland Plug Divers. Small, friendly dive club welcomes newly qualified and experienced divers to join us. Regular hardboat diving around Bass Rock/Firth of Forth/ Eyemouth and trips abroad. Tel George: 07793 018 540. Email: plugdivers@btinternet.com (64638)
Selby Aquanauts SAA 1117. Family friendly club, welcomes new and qualified divers. Regular trips UK & abroad. Meet every Thursday, Albion Vaults, Selby at 9pm. Contact Mark: 07831 295 655. (69261)
Sutton Coldfield SAC, friendly BSAC club, welcomes all divers from trainee to advanced. All agencies. Own RIBs and compressor. Meet every Wednesday, 8.15pm at Wyndley (3.4m pool). For free try dive call Alan: 07970 573638 or Mark: 07787 106191. (64974)
Sheffield BSAC36. Friendly, social and active dive club welcomes newcomers or qualified divers. Trips, socials, weekly pool and club/pub meetings, club RIB. See www.bsac36.org.uk (69191)
Slough 491 BSAC; small friendly club welcomes divers at all levels. Meet at Beechwood School Fridays 19.30. Diving holidays and South Coast. Email: malcolm@uv.net or tel: Tony (01344) 884 596. (69722)
SOS Divers (SAA 263), Stourport, Worcestershire. Founded 1979. Friendly family club welcomes qualified and trainee divers. Own RIB. Contact Althea by email: arannie123@outlook.com (57542)
South Coast Divers (SAA 1150) Portsmouth. A friendly and active club welcomes new and experienced divers from all agencies. Email: southcoastdivers@hotmail.co.uk or call Darren: 07449 794 804. (69224)
Totnes SAC (Devon). We are an active multi-agency club and welcome new members and qualified divers from all organisations. Two RIBs and own compressor/nitrox, plus club 4WD. Diving all round South Devon and Cornwall. Visit www.totnes-bsac.co.uk for details. (68319)
South Queensferry SAC, near Edinburgh. Two RIBs, gear for hire. Pool training during the Winter; trips & expeditions in the Summer. Pub meeting at Hawes Inn. Call Warren: 07980 981 380. www.sqsac.co.uk (64861)
Steyning Scuba Club, West Sussex. All divers welcome. Steyning Pool , Monday evenings at 8.30pm. Contact Andy Willett on 07786 243 763. www.seaurchin divers@hotmail.co.uk (63956)
The Bath Bubble Club SAA777 seeks new members. New and qualified divers of all agencies welcome. Weekly pool training, every Wednesday at 9pm, Culverhay Sport Centre, Rush Hill, Bath. Regular diving programme from club RIB. www.bathbubbleclubuk.co.uk (68434)
Wells Dive Group. Friendly, active club in Somerset welcomes new or experienced divers. Meeting/training at The Little Theatre or the pool on Thursdays, try dives available. Regular RIB diving, trips around the UK and abroad. Visit: www.wellsdivers.co.uk or Tel: Rob, 07832 141250. (69653)
TridentDivers.co.uk (find us on Facebook) Cardiff-based SAA club taking on new trainees and crossover members contact us on 07547 398802. (71656)
Wiltshire's newest Scuba Diving Club - JC Scuba Dive Club. Friendly active dive club based in Swindon, all affiliations welcome. Pool sessions, UK & Worldwide trips, shore, boat & liveaboard diving, regular socials. Affiliated training school, fully insured. Exclusive member benefits. www.jcscubadiveclub.co.uk

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09/20

How does your family combine diving and dining?

Are you the sort of diver who can happily put the demands of your stomach on hold while enjoying your sport? Not everyone is so self-disciplined, and still-growing divers especially need their dietary fixes. TORI DAENEN of Scuba4families reports

IT'S A COLD BUT SUNNY spring day, and as it's the weekend you treat your family to a good old-fashioned English breakfast. The kids tuck in with relish and add as much tomato ketchup as they can to the fried sausage and pool of baked beans.

Only later, when you're out on a choppy dive-boat with stomachs in mouths, do you realise that perhaps a greasy-spoon breakfast wasn't such a good idea.

You try to calm the groans from the kids by offering water, only to find that as they try to hoist up their 8mm wetsuits the rocking motion proves too much and yes, they throw up, one in the sea and one all over the deck.

You apologise profusely to the skipper and to all the other divers on board, while mopping up and comforting mortified children. It's not a pretty picture and leaves a literal "bad taste" as you set off on your dive.

To make matters worse, during the dive you curse yourself for eating those baked beans, because the bubbles from your reg are not the only ones emerging…

While this might be extreme (albeit, I'm afraid, a true story), the timing of when and what you and your family eat before a dive needs to be considered and carefully planned.

So what should you take into account when planning meals around a day's diving with your family to avoid such unpleasant scenarios?

I have sought the wisdom and experience of other families at Scuba4families and come up with a few hints and tips on meal- and dive-planning to optimise everyone's energy levels and make your dives safe and enjoyable.

ENERGY & DIVING

Not eating enough before a dive can have disastrous consequences. Mood swings and tantrums can prevail and spoil a family day out. Young people burn energy at a significantly higher rate than adults, so have to be refuelled continuously.

If they're not eating sufficiently tiredness can creep in, resulting in a lack of concentration, or physical impediments such as leg cramps.

So it's important for everyone to have enough energy on board before they dive, but particularly so for young people, because they run out of energy more quickly.

During a dive your body keeps itself warm by burning the energy (calories) from the food you've eaten. Several factors influence how many calories you burn during a dive: water temperature (the colder the water, the greater the loss); the type of dive (the more strenuous, the greater the loss); body size; height and age.

Research has shown that for adults an average shore-dive in temperate water burns up to 600 calories per hour (similar to running). A leisurely boat-dive in warm, tropical waters burns about 300 calories an hour, equivalent to hiking or a brisk walk.

For children and adolescents, this calorie burn-rate is even higher.

It's easier when planning your meals on dive days to break it down into eating before, during and after your dives.

BEFORE THE DIVE

It's important to start the day well. A healthy, high-carbohydrate breakfast is a good family choice before morning dives.

We tend to go for porridge, honey and non-citrus fruit such as bananas. This provides the body with calories that are easily digested and can be released slowly over several hours.

We try to avoid greasy foods, citrus fruits or orange juice because of its acidity, which can lead to upset stomachs and increase the chances of becoming seasick.

What is essential is drinking enough water to keep the body hydrated. If you follow this advice, you should have a happy group of dive-buddies!

WHILE YOU DIVE

Eating while you dive? OK, perhaps "between" dives is better, although our family did enjoy a unique underwater restaurant experience while we dived at Belgium's NEMO 33, the world's second-deepest pool – we called it "Deep Dining" (*pictured*).

After your first dive and during the surface interval, good dive-centres usually provide snacks and drinks to share. It's an excellent way to keep their customers happy, though the food they provide can be a bit hit or miss.

Non-acidic fruit and vegetables are great because they provide hydration as well as natural energy. Bananas are full of potassium that helps to avoid cramps while diving.

Try to avoid salty foods such as crisps, which will make your mouth dry and increase your thirst; anything stodgy that will cause your digestive tract to work hard; and food items that can cause heartburn.

AFTER YOUR DIVE

Many people come up from a dive famished, and this is often the case with young divers. After a strenuous workout your metabolism doesn't return to normal immediately.

Your body can continue burning calories at this increased rate anywhere from a few hours to well beyond 24 hours after exercise, depending on the person.

De-kitting and de-suiting can still represent a workout and it's a time to indulge in guilt-free sugary snacks – you've earned them! As soon as possible at the end of your dive day, find a restaurant and order pasta and rice dishes that offer immediate satisfaction from their high carbohydrate content.

Add in some vegetables and protein and you have a balanced meal for all the family. Remember to remind all the young people to drink an extra couple of glasses of water so that their bodies can hydrate properly and help offload any leftover nitrogen.

To conclude, we recommend when diving with young people to eat before, while and after the dive, so that high energy and concentration levels can be maintained, and full enjoyment can be experienced by all the family.

Happy diving and dining!

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