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World-beating ambitions

IS THE AGE OF COVID also the age of solitary endeavour? Recent weeks have seen a flood of solo underwater record attempts, as sub-aqua adventurers decide to test themselves in ever-more extreme ways.

They might have support teams to help them comply with the requirements both of health & safety bodies and those that ratify world records, but essentially it's a matter of individual humans testing themselves against the odds.

Cold water and overhead environments have loomed large, with European freedivers Alexey Molchanov (already a record-breaker on an industrial scale), Arthur Guerin-Boeri and David Vencel all either diving or swimming under metre-thick ice in various states of exposure to the elements.

Whether or not their record bids are ultimately ratified, these divers have all achieved personal bests that most of us could scarcely contemplate. That said, a surprising new study has suggested that many of us are genetically predisposed not to feel the cold the way the majority of us do.

South Africa is the land of cave-set diving depth records. Technical diver Karen van den Oever's claim to have become the deepest-diving woman after reaching 236m in the Boesmansgat sinkhole in late March now awaits Guinness World Records verification.

Fellow South African Verna van Schaik set a 221m benchmark at the location 17 years ago. Karen's epic dive took more than seven hours.

Next up is what seems to be the equivalent of a conjuring trick – at least, that was how magician David Blaine presented it when he held his breath under water for 17 minutes to public acclaim in 2010.

Now Croatian freediver Budimir Buda Sobat has broken his own record by managing not to breathe while submerged for 24min 33sec.

As you'll realise, he had stocked up on pure oxygen beforehand, but it's not quite that simple. Over time the 54-year-old has trained his body to allow for an unusually slow release of O₂ – and not to start convulsing after 20 minutes. That is breath-taking dedication.

JUST STAYING ALIVE has become a primary objective during the coronavirus pandemic, and at some point recently American latecomer to scuba Bill Lambert snuck into the Guinness World Records books as the world's oldest diver.

For years inspirational British diver Ray Woolley held the title, but at 97 he has given way to his senior Bill, who was older than that when he *took up* diving. He isn't a regular in the water like Ray, but he is now the world's first official scuba centenarian. Hope for us all.

I could go on and cite ocean-explorer Victor Vescovo for carrying out the world's deepest-ever wreck dive at 6.45km in his no-limits sub, but he did have a companion on his visit to USSS *Johnston*. And Victor spends so much time in the hadal zone that his jaunts must be becoming like a drive to the shops.

But while an upstart virus is still calling the shots and keeping people apart, it's good to see human beings determined to show what can be achieved in isolation.

FIRST



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EDITOR

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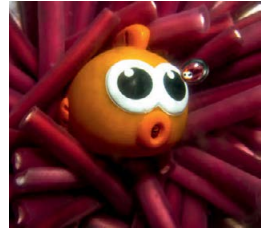
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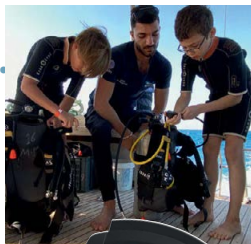
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Greece tempts diving visitors with 91 wrecks – and promises of more

SCUBA-DIVERS MIGHT be forgiven for thinking that Greece had already lifted its restrictions on wreck-diving several times over, but in late March the country's Ministry of Culture & Sports announced the official opening to recreational divers of 91 ship and aircraft wrecks – and said that more such attractions were on the way.

Selected by the Ephorate of Underwater Antiquities, which oversees underwater archaeological activities in Greece, with guidance from the Central Council for Modern Monuments and the Ministry of Foreign Affairs, the wrecks announced are predominantly WW2-era, though some date back to 1868 and others are as recent as 1970.

Many are at technical-diving depths, down to 130m, and they are located across Attica, the Aegean, Crete, central Macedonia, the Ionian Islands, western and central Greece, Epirus, the Peloponnese and Thessaly.

A number of the sites are still subject to investigation by the Ephorate, and all recreational diving is stipulated as being on a strict no-touch basis.

Divers will be interested in the fact that 16 of the wrecks are of aircraft in depths from 8 to 74m, with the majority deeper than 30m.

They include British and Italian warplanes but most are German, with a predominance of Junkers Ju-88 bombers.

There are also a number of notable British wrecks, including the *Titanic's*

sister-ship *HMHS Britannic* at 130m, the submarine *HMS Perseus*, and the deep-lying resting places of the torpedo-boat *HMS Chamois* and the minesweepers *HMS BYMS 2077*, *HMS Regulus* and one thought to be *HMS By George*. There are also some eight British cargo and passenger vessels.

Another 13 Italian, German, Greek, American and Australian warships are also listed. The other wrecks are mainly merchant ships with some passenger vessels and yachts under a variety of European flags.

Although a good number of the wrecks will appeal only to technical divers, the Greek government sees the loosening of restrictions as important in attracting additional tourism revenue. While many countries have been sinking artificial reefs in a bid to attract diving tourists, Greece already has a wealth of such attractions at its disposal.

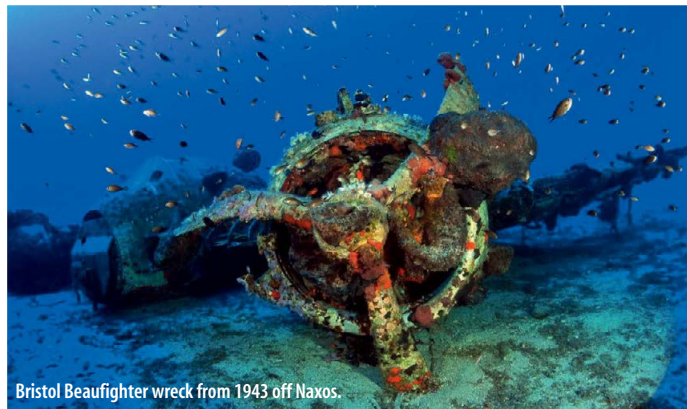
"The seabed of the Greek seas is an underwater ark of our history," said Minister of Culture and Sports Lina Mendoni, announcing the opening up of the wrecks. "These protected underwater areas, where shipwrecks from World War Two are located, open the pages of modern Greek history.

"At the same time they show a strong growth potential, because underwater tours are a special, extremely interesting form of tourism that attracts high-level-income visitors."

The move follows the inauguration of an "underwater museum" near the Aegean island of Alonissos in August last year to allow divers to take guided tours of the remains of the *Peristera* shipwrecks dating back to 425 BC – though the impact of that opening was inevitably muted by the coronavirus pandemic.

"The combination of diving parks with underwater areas that host and protect historic shipwrecks is a great advantage for Greece," said Mendoni.

"We must make use of it, because it adds value to tourism and creates conditions for sustainable development of local communities." ■



Bristol Beaufighter wreck from 1943 off Naxos.



Unidentified shipwreck.



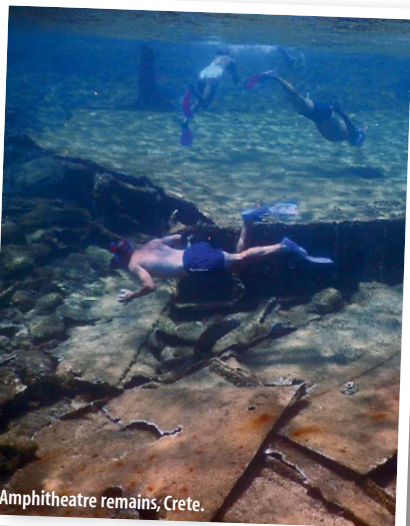
Junkers Ju-88 off Kefalonia.



Arado Ar-96 trainer aircraft wreck off Crete.

EPHORATE OF UNDERWATER ANTIQUITIES

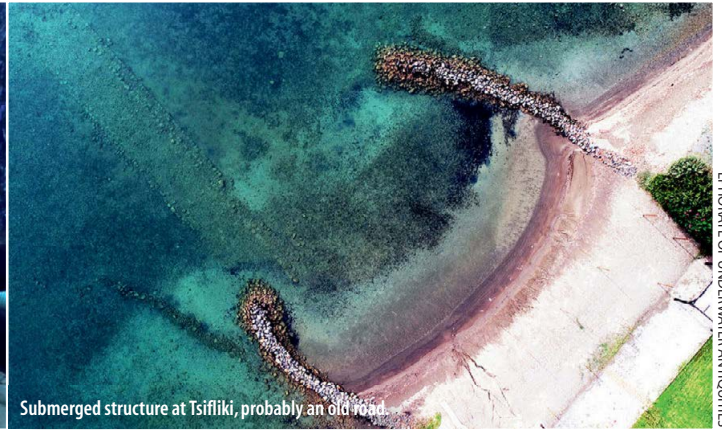
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Amphitheatre remains, Crete.



Cleaning the surface of the submerged structure in Poros.



Submerged structure at Tsifliki, probably an old road.

EPHORATE OF UNDERWATER ANTIQUITIES

Also in Greece: divers explore ancient city of Olus...

THE ANCIENT SUNKEN CITY of Olus and its surroundings in Crete's Elounda Bay have been revisited by an archaeological dive-team, says Greece's Ministry of Culture & Sports.

Ephorate of Marine Antiquities and volunteer divers, scientists and geophysicists from the Institute of Mediterranean Studies' Satellite Remote Sensing Laboratory were examining the site for the fourth year in a row.

Olus was a leading harbour city in ancient Crete and once had a population of more than 30,000.

Ancient inscriptions found in its

ruins have linked it with Knossos and Rhodes, and its disappearance could have been the result of a major earthquake in 780 AD.

The latest data collected combined with that from previous years and the study of sources "gradually clarifies the picture of the ancient city and its territory," said the ministry.

The divers focused on a central area called Poros, clearing sand and weed to expose the upper brickwork of a large extended structure, thought to be part of the city wall or a jetty.

Work on other structures provided data that was digitally processed into

3D images. The seabed substrate was examined to 1.5m deep with electrical and magnetic resonance imaging to find ancient structures and learn more about those visible at the surface.

In Krios Bay scattered pottery finds indicated its use as an anchorage, while in Vathi Bay, where a submerged

building complex had been found earlier, Minoan ceramics were found mingled with purple oysters.

In the Tsifliki area, images were captured of the sunken remains of buildings and an elongated structure thought to have been a road leading to the bays. ■

...AS BRITISH TEAM BREAKS BACK OF ANTIKYTHERA RIDDLE

IT WAS ONE of the most significant discoveries ever made at a shipwreck site: the 2000-year-old "Antikythera Mechanism", retrieved by sponge divers in Greece 120 years ago, is reckoned to have been the world's first-known analogue computer. But it was incomplete, and its workings have baffled scientists ever since.

Now researchers at University College London (UCL) report that they have solved a major piece of the puzzle, and could be in a position to recreate the bronze device, the most

complex piece of engineering to have survived from the ancient world, as it originally worked.

The divers, working off the island of Antikythera, retrieved an aggregation later found to contain 82 pieces of the device in the remains of a wooden box, but around two-thirds of it were never found. The find is kept at Athens' National Archaeological Museum.

With its intricate combination of 30 surviving bronze gears, the device was designed to predict astronomical events such as eclipses, lunar phases, planetary positions and even propitious dates for the Olympic Games,

but the mystery lay in exactly how it was able to do this. The new study by the multi-disciplinary UCL Antikythera Research Team has revealed that a complex gearing system at the front of the mechanism is in fact a display of the ancient Greek order of the universe, or cosmos.

The biggest fragment included bearings, pillars and a block, while another featured an unexplained disc, a 63-tooth gear and a plate.

X-rays had previously revealed thousands of text characters hidden inside these fragments, including a description of a display of the cosmos, with planets indicated by beads moving on rings. The team had set out to reconstruct this display.

Two key numbers among the inscriptions appeared to represent cycles of Venus and Saturn.

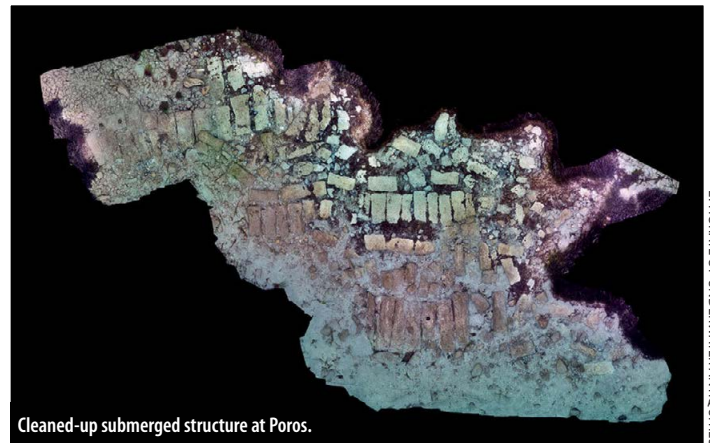
"The classic astronomy of the first millennium BC originated in Babylon, but nothing in this astronomy

suggested how the ancient Greeks found the highly accurate 462-year cycle for Venus and 442-year cycle for Saturn," said researcher Aris Dacanalis.

Using an ancient Greek mathematical method, the team not only managed to explain how the cycles were derived, but also recovered those of all the other planets, even though the evidence for these was missing.

The researchers created "innovative mechanisms for all of the planets that would calculate the new advanced astronomical cycles and minimise the number of gears in the whole system, so that they would fit into the tight spaces available," said Prof Tony Freeth, lead author of a paper published in *Scientific Reports*.

The team now plan to reconstruct the entire Antikythera Mechanism using only the type of techniques that would have been available in ancient times. ■



Cleaned-up submerged structure at Poros.

EPHORATE OF UNDERWATER ANTIQUITIES



Exploded view of how the Antikythera Mechanism might have looked.

UCL

Ice-breakers: assaults on freediving records

RUSSIAN FREEDIVER Alexey Molchanov has claimed a world under-ice depth record following an 80m plunge in Siberia's Lake Baikal – while French freediver Arthur Guerin-Boeri has staked his claim to a new under-ice distance record of 120m in Finland's Lake Sonnanen.

On 16 March, Molchanov, 34, descended through the 2°C water from a hole cut in the metre-thick ice in his bid to complete the deepest freedive under ice using a monofin.

The dive took 2min 53sec and was verified by an official from freediving world governing body AIDA.

If also verified by Guinness World Records, the dive will displace that of Australian freediver Ant Williams, who reached 70m in a Norwegian lake in 2019.

The dive is Molchanov's 20th world

record. He remains unbeaten in three of AIDA's core depth disciplines: constant weight (130m), constant weight with bi-fins (113m) and free immersion (125m).

Molchanov also claimed the record for dynamic apnea under ice using a monofin in February 2020, when he covered 180m.

And it was a breath-hold swimming record that Guerin-Boeri had in mind as he took 3min to cover a distance of 120m without fins on 25 March.

The 36-year-old freediver wore a wetsuit as he swam between a set of ice-holes cut 20m apart, guided by a cable – though next year he hopes to perform a similar feat but without thermal protection.

Guerin-Boeri's competitive bests, as recorded by AIDA, are 6min 41sec for static apnea, 211m for dynamic apnea no fins and 51m in constant weight

no fins.

2021 has brought a flurry of under-ice breath-hold activity.

In February Czech freediver David VencI claimed a new Guinness World Record for distance-swimming under ice without fins or thermal protection.

The 38-year-old took 95sec to cover 81m in a Czech quarry.

The record of 76m has been held by Danish freediver Stig Severinsen since October 2013 and is still shown

by Guinness World Records at present – as is his under-ice distance record of 152m with wetsuit and fins, swum in 2min, 11sec eight years ago. ■



Alexey Molchanov after his 80m under-ice dive.



Arthur Guerin-Boeri completes his 120m breath-hold swim.

...while scuba-divers find first Arctic fluo-fish in Greenland

BIOFLUORESCENCE, the ability to absorb energy from sunlight and re-emit it as a different colour, is familiar to scuba-divers observing marine life in tropical waters. But now two diving marine biologists have documented the phenomenon in Arctic fish species for the first time.

A red-and-green-glowing snailfish (*Liparis gibbus*) was identified during their dives among icebergs off eastern Greenland during a 2019 Constantine S Niarchos expedition.

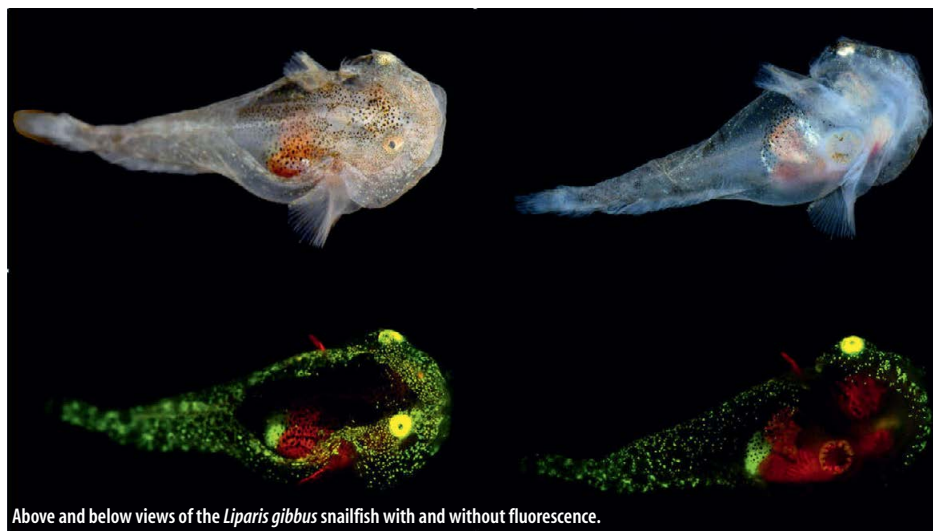
Having failed up to that point to find evidence of marine fluorescence among Arctic invertebrates or vertebrates, "we were surprised to find these juvenile snailfish brightly fluorescing in not just one, but two different colours, which is very unusual in a single species," said ichthyologist John Sparks, an American Museum of Natural History curator.

He and co-author of the study David Gruber of Baruch College, a research associate at the museum, had in the course of seven years identified 180 new biofluorescent species in parts of the world with an even amount of daylight year-round.

Discussing their research one day in a New York café, talk had turned to how prolonged Arctic darkness might affect biofluorescence in fish – and led to the expedition.

"As soon as we got to Greenland, we realised: 'Boy, we might be in over our heads,'" says Sparks in a video about the dive-trip, which can be seen on YouTube. "The dives are brutal. They're exceedingly cold – it's crazy in a way.

"We targeted Greenland because there were groups there like the scorpionfishes that we found



Above and below views of the *Liparis gibbus* snailfish with and without fluorescence.

elsewhere would fluoresce, so we could directly compare it to tropical or temperate regions."

"We did dives in several different habitats," says Gruber. "We looked in fjords, we looked in the kelp forest, and in several of the dives we actually looked for specimens in the ice, among the icebergs.

"In the tropics, almost all hard corals are fluorescent. Many of the anemones are fluorescent and when we get to Greenland there's almost zero – and that's interesting."

Eventually seeing a glowing fish came as a shock. "Finding a red and green biofluorescent snailfish on a dive among icebergs at night felt like a moment

straight from *The Life Aquatic with Steve Zissou*," commented Gruber.

The pair also identified red biofluorescence in an adult kelp snailfish (*Liparis tunicatus*), collected in the Bering Strait off Little Diomed Island in Alaska.

"We are now focusing our efforts on determining the function of fluorescence in various fish groups, including cat sharks, where we have shown that bright green fluorescence enhances contrast in their pigmentation pattern, making it easier for individuals to see each other at depth," said Sparks.

The divers' Arctic study is published in *American Museum Novitates*. ■

AMERICAN MUSEUM OF NATURAL HISTORY

'Amazing' seabed revealed as ice-sheet parts

CROHLEDER



The giant iceberg A74 calved from the Brunt Ice Shelf.

SCIENTISTS WERE ON THE SPOT

to report "an amazing level of biodiversity" on an Antarctic seabed that was suddenly exposed to sunlight when a 500-square mile iceberg broke away from the Antarctic ice-sheet.

The giant iceberg calved on 26 February and experts from the Alfred Wegener Institute (AWI)'s Helmholtz Centre for Polar & Marine Research and international partners aboard the German icebreaker *Polarstern* have now reported formally on their "once-in-a-lifetime" opportunity to view an underwater environment that normally exists in darkness below hundreds of metres of ice.

As gale-force wind conditions relented, the vessel was able to enter the area between the iceberg, named A74, and the Brunt Ice Shelf.

The team had been studying the effects of climate-change in Antarctica, usually relying on drilling down through the ice-sheet for sediment and water samples.

"It's rarely possible to be nearby when a region becomes ice-free and first comes in contact with sunlight," stated AWI. "Icebergs of this size only calve roughly once every 10 years in the Antarctic."

Using its Ocean Floor Observation & Bathymetry System – a camera on a platform towed below the ship on



Small sponges, bryozoans, anemones and soft corals were found on a substrate of glacial rocks.

ALFRED WEGENER INSTITUTE

an extended cable – the team were able to film the seabed down to around 800m.

They were surprised to record

numerous filter-feeders such as anemones, sponges and soft corals, which had settled on rocks that would have been carried out to sea by glaciers before falling into the silt.

The scientists want to find out whether the filterers feed on algal remains or on organic particles transported with the ice.

Their usual diet of phytoplankton is not usually expected to be found in such dark environments.

Also recorded were at least five fish species and two squid species, along with sea cucumbers, seastars and a range of molluscs. ■

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UK cave-diver died using unproven rebreather

A N INQUEST HAS heard how a cave-diver in Cumbria drowned close to the surface early last year, after a problem was thought to have occurred with his rebreather, a unit under development.

Simon Halliday, 49, from Clitheroe, Lancs, died at Lancaster Hole near Kirkby Lonsdale on 4 January, 2020.

The incident was reported in **DIVER**, (News, March) although at that time the victim remained unnamed and was thought to have been older.

Lancaster Hole is an access point to the Three Counties System, one of England's biggest networks of limestone caves. It extends beneath Cumbria, Lancashire and the Yorkshire Dales.

Divers had been in the process of extending the downstream passage from the hole, exploring some 900m beyond the sump pool from which it was normally accessed.

Halliday was an experienced cave-diver, having resumed following a hiatus while on holiday in Egypt some two years before his death. He belonged to the Northern Section of the Cave Diving Group (CDG) and other groups.

He had travelled to the dive-site, which he had dived before, with two friends, David McDonough and Kevin Gannon.

He told them that his planned solo dive would take no more than three hours, according to a report on the inquest at Cockerthorpe Coroner's Court by the *Westmoreland Gazette*.

Halliday was using a rebreather said to be in development and so not commercially available. It had been



supplied to him by sporting goods company Sump UK.

His friends waited four hours after his departure before raising the alarm. Cumbria police alerted the Cave Rescue Organisation and as many as 40 members and divers from the CDG were said at the time to have responded.

It was diver Anthony Seddon who discovered Halliday's body, 14 minutes and 60m into the underwater passage. According to the press report, when Halliday was pulled out of the water, his "oxygen supply pipe" appeared to have been disconnected or ripped out, though whether this had occurred on the dive or during the recovery was uncertain.

However, data from Halliday's dive-computers "supported the idea that his rebreathing equipment had failed him" and that he had switched to his bail-out.

According to McDonough and Gannon more water had been flowing into the passageway than usual. Halliday was said not to have

regarded this as an issue, but the current appeared to have increased while he was gone.

The inquest heard that this might have required him to fight against the flow on his way back, becoming stressed and using more air than expected.

He could also have been fighting to avoid drifting up towards the ceiling as he became increasingly buoyant.

Expert witness cave-diver Jason Mallinson said that the Sump UK-supplied rebreather had a straight fitting to the drysuit, whereas an elbow fitting with a 90° bend would have prevented it from unscrewing, if that was what had happened.

Halliday, who was married with two children, liked to "push himself" and "operate at the extreme", McDonough told the court.

Assistant coroner for Cumbria Dr Nicholas Shaw said it was "most likely" that Halliday's rebreather had failed him and recorded a conclusion of misadventure, with drowning the medical cause of death. ■

Company fined for diver killed by sting ray

THE SINGAPORE oceanarium in which its senior diving supervisor was killed by a sting ray four and a half years ago has been fined \$105,000 (around £57,000) for safety lapses in which he had been complicit.

DIVER reported on the scuba-diver's death in October 2016, and earlier this year reported that his employer Underwater World Singapore (UWS) had been found guilty of the charges.

UWS had closed its Sentosa facility permanently to the public and was transferring its marine animals to other locations.

One of four leopard whiptail rays had pierced 62-year-old Philip Chan's chest with a 22cm barb during the operation, puncturing his heart and aorta, and he had died of his injuries.

Passing sentence on 23 March, district judge Adam Nakhoda referred to a string of safety breaches identified by Singapore's Safety & Health Inspectorate.

He said that Chan's 25 years of experience had been no substitute for provision and implementation of formal safety procedures.

In January a representative of UWS had admitted to the four general health & safety failings: to provide adequate risk assessment and safe work procedures, supervision and look-out for divers, adequate diving-emergency recovery procedures, or a system to check equipment before diving.

The prosecution had argued for a \$150,000 fine, while the defence, claiming that Chan's death was a "freak accident", had proposed \$40,000.

In setting the penalty, the judge took into account that the company had implemented some safety measures.

The maximum penalty would have been \$500,000. UWS is part of the Haw Par Corporation. ■

THAI CAVE-DIVING SITE CLAIMS ANOTHER VICTIM

IN THAILAND an experienced scuba-diver was found dead in the water at a popular inland cave-diving site in the southern province of Nakhon Si Thammarat on 3 March.

Torsak Warinchaikamon, 47, from Samut Prakan near Bangkok, was

reported to have undertaken a deep dive with friends at the site in Talay Songhong Park.

When the other divers arrived back at the surface they had found Torsak floating dead at the surface.

Emergency services were called at about 4.30pm, and police later

said that his dive-computer indicated that he had dived to almost 80m and had been under water for 25 minutes.

In December 2019, UK expatriate diver Roger Smith died following a dive in a 140m-deep limestone sinkhole in the same area. ■



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Scuba fish thieves pay high price

TWO SCUBA-DIVERS were abandoned in open water off Hawaii after their dive-boat had been intercepted for illegal collection of fish for aquaria and sent back to harbour.

Now the married couple responsible for the poaching have been fined a record US \$272,000 – and that’s before the case even reaches the criminal courts.

The incident occurred in the West Hawaii Regional Fishery Management Area, off the town of Kona on Hawaii Island, on 15 September last year.

The civil fine has been imposed on Stephen Howard and Yukako Toriyama following a unanimous vote by Hawaii’s Board of Land & Natural Resources (BLNR).

Howard, described as an “aquarium collector”, had left Honokohau harbour and

dropped off his wife and an unnamed female dive-buddy to collect the fish.

Officers from the Division of Conservation & Resources Enforcement intercepted the boat following a tip-off and ordered Howard to take it back to shore, which he did – leaving the divers in the water.

The other woman told investigators that the pair had surfaced to find Howard and the boat gone.

A multi-agency marine search and rescue operation had been mounted when it was realised what had happened, only to be called off late that afternoon when the women were found on land with their dive-gear. They had made it back to Kona and were spotted at a filling-station.

Biologists from the National Oceanic & Atmospheric

Administration’s Office of Law Enforcement and Hawaii’s Division of Aquatic Resources checked the 235 fish that the divers had already caught and left on the boat.

They identified 10 species with an estimated retail value of \$24,730, and later returned the fish to the sea (although the images suggest that they might have been too late).

Howard was fined for 16 fishing and boating violations, and Toriyama on nine Hawaii Administrative Rules (HAR) counts. The couple must now face criminal charges in Hawaii District Court.

“I hope anyone engaged in illegally depleting Hawaii’s natural resources will realise the cost of breaking the law, based on the high fines levied in this case,” commented BLNR chair Suzanne Case. ■



Police found 235 fish that had already been caught.

HAWAII DIVER

ANCIENT SHIPWRECK IN SPAIN TO BE TRANSFERRED ASHORE

THE WRECK OF one of the oldest intact shipwrecks in the Mediterranean is to be raised. The well-preserved Phoenician ship currently lies in shallow water about 50m off Playa de la Isla near the Spanish port of Mazarron, and will be raised and transferred to a maritime museum in nearby Cartagena for restoration.

The ship was revealed during the 1990s when a storm shifted sand that had been protecting it for around 2700 years.

It was dubbed *Mazarron 2*, because the keel, ribs and strakes of another ancient Phoenician shipwreck had

already been found in the area in 1988.

Spain’s National Centre of Sub-Aquatic Archaeological Research excavated both wrecks between 1993 and 2000, gaining new insights into ancient shipbuilding. *Mazarron 2*, which lies in about 3m of water, was found to be largely intact, even down to the remains of ropes.

The idea of moving the ship to a place of safety had long been discussed but Spain’s Ministry of Culture & Sports said that urgent action became necessary in the wake of Storm Gloria early in 2020.

The wreck was placed under a protective metal cover at that time and archaeological scuba-divers kept the site under close observation.

Their conclusion that it now needs to be made more secure has been supported by the Mazarron, Murcia and national governments.

The ship is about 8m long and 2m wide and was built from a combination of cypress, Aleppo pine, olive and fig-tree wood. Its cargo of nearly 3 tonnes of lead ingots was found along with a “shaft, stock and nail”-type anchor, the oldest known example in the Mediterranean.

The two ships are thought to have been small coastal vessels used to transfer cargo to bigger ships offshore, which *Mazarron 2* was probably doing when it sank. Puerto de Mazarron was an important

trading port for the Phoenicians, because it was close to lead and silver mines a few miles inland.

The Phoenicians sailed from the eastern Mediterranean, from what is now Lebanon, Syria and Israel, and were active traders in the Iberian peninsula until around 200 BC.

The wreck will now be transferred to the National Museum of Subaquatic Archaeology (ARQUA), where the excavated remains of *Mazarron 1* and a replica of *Mazarron 2* can be seen. An international conference of experts is to be held to establish the best extraction and preservation systems to use. ■



The wreck in situ.



Replica of Mazarron 2 at ARQUA.

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ONCE-ABUNDANT reef sharks that are particular favourites with scuba-divers are now under increased threat, according to the latest status updates from the International Union for Conservation of Nature (IUCN), released on 25 March.

This includes Caribbean reef sharks (*Carcharhinus perezii*), reclassified from Near Threatened to Endangered; lemon sharks (*Negaprion brevirostris*), from Near Threatened to Vulnerable; and Atlantic nurse sharks (*Ginglymostoma cirratum*), from Data Deficient to Vulnerable.

Even more worrying, 39 additional shark and ray species now face possible extinction in the wild – and one ray might already be extinct.

In total 355 species are now categorised as either Vulnerable (167), Endangered (112) or Critically Endangered (76).

Eight of the nine species uplisted to the Critically Endangered category, one step from extinction, are rays, mostly guitarfishes and eagle rays – again diver favourites. These rays are less familiar to the public than sharks, but WWF says that they are “doing even worse” because of overfishing and lack of fisheries management.

The Java stingaree (*Urolophus javanicus*), listed as Critically Endangered in 2006, has now been re-assessed as Critically Endangered

Sharks and rays are being driven closer to extinction



Critically endangered – diver favourite the common eagle ray.

VLADIMIR WRANGEL

(Possibly Extinct). The endemic Indonesian species has not been seen since its discovery in the late 19th century.

“The alarm-bells for sharks and rays could not be ringing louder,” said Dr Andy Cornish, leader of WWF’s global conservation programme Sharks: Restoring the Balance. “The sheer number and diversity of these animals facing extinction is staggering.

“The latest reassessments highlight

that fishing is causing population declines across the spectrum of these ancient animals.

“Whether rays or sharks, those on sunlit coral reefs, far offshore, or in the deep oceans, large and small – few groups are unscathed.”

“Overfishing is by far the greatest threat and has to be reined in,” said Dr Cornish. “The good news is that solutions to this crisis do exist.

“Governments and the regional

fisheries management organisations, which manage fishing in the high seas, must act now and boldly to recover the most threatened species before it is too late.”

In 2014, 25% of all shark and ray species were threatened, with 25 species Critically Endangered.

Seven years on, 36% are under threat – and the Critically Endangered tally has tripled to 76%.

“More than 1200 different species of sharks and rays inhabit our global ocean,” says WWF. “These diverse animals do not simply dwell there – they shape the ocean, and have done so for more than 400 million years, since the time of dinosaurs.

“Sharks and rays are indispensable to ocean health and the well-being of millions of people across the globe through provision of livelihoods, food and tourism.”

Sharks: Restoring the Balance, a joint global programme of WWF and TRAFFIC, was founded in 2014 and supports conservation teams working in more than 20 countries and territories. ■

Video lifeline and lyre music win Covid heroes dive-trips

THE SECOND and third of Emperor Divers’ eight Covid Diver Heroes, individuals nominated for having stepped up during the pandemic, have been named and awarded free liveboard trips.

Noam Har-Tzvi from Israel has won a Maldives liveboard trip for her efforts. She was nominated by her brother Adi for founding a voluntary initiative called Staying Together to connect coronavirus patients with their families.

“She couldn’t stand the thought of elderly people dying alone in hospitals isolated from their families, so she decided to take action,” explained Adi.

“Together with an amazing team of volunteers, she raised donations of tablets and laptops.”

The devices were programmed to be used by remote control when the patients were in bad shape and the medical staff too busy.

Har-Tzvi organised the volunteers to operate the devices, facilitating thousands of video calls between



Noam Har-Tzvi.

families and patients.

“They connected children, parents and grandparents, wives and husbands, new mothers and their babies and more,” said her brother.

“The video calls immediately improved the spirit for all, allowing the patients to get love and support from their dearest and get better.

“Sadly, some of those calls were the last time they talked, and gave them



Megumi Gotada.

the chance to say goodbye.”

The Staying Together initiative, established in eight hospitals and care homes in Israel, is continuing.

Musician Megumi Gotada became the third Covid Diver Hero at the end of March, and won a Red Sea liveboard trip. She had been working as a music therapist in a Berlin hospital, playing the lyre for patients suffering from severe complications of Covid-19, and was in fact nominated by two different people.

“It was her free choice to accept to work in the Covid department, and she decided to do so although her family and friends strongly tried to

prevent her from doing so,” wrote her friend and colleague Katharina Berger.

“What she is doing is very important, because the music gives warmth, hope and care for the soul.

“Most of the patients, who are isolated in their rooms in order to prevent any spread of infection, are elderly people, suffering from shortness of breath, and also from anxiety, depression and loneliness, which are states of mind that are really not helpful in the process of recovery.

“The beauty of the tender sound of the lyre and Megumi’s warm-hearted presence strengthen the people to gain hope and health again.”

“Nominations are still pouring in daily,” said Emperor Divers, stressing that with two more Red Sea and three Maldives liveboard trips to award, it was still open to further suggestions of worthy winners.

Find the terms and conditions at emperordivers.com, and email nominations, questions and enquiries to heroes@emperordivers.com. ■

Slug head with a life of its own

SAYAKA MITOH



Head and body of *Elysia marginata* a day after 'autonomy'.

IN WHAT IS described as the most extreme example of autonomy and regeneration ever seen in nature, at least two species of sea slug commonly seen by scuba-divers in the Indo-Pacific region deliberately detach their own heads from their bodies – and proceed to grow replica bodies.

The heads are able to survive independently for weeks, because the slugs are capable of kleptoplasty, the ability to steal parts of a cell that allow the algae they eat to photosynthesise.

They use this ability routinely when food is scarce, but when they need to regenerate it gives them the energy to initiate the process, although they do have to resume eating algae within days of autonomy.

What's more, the decapitated body can survive too, for months at a time, although it doesn't appear capable of growing a new head.

It is even thought that individual slugs, which grow to around 80mm, can regenerate in this way up to twice in their lifetimes.

It seems that only younger slugs are capable of autonomy and regeneration. Although older ones can survive as heads alone for up to 10 days, they don't resume feeding or start to build a new body, possibly because once past reproductive age there is no evolutionary advantage.

The regenerating molluscs could be mistaken by divers for



The new body starts to grow.

nudibranchs but are in fact sacoglossan sea-slugs from the *plakobranchidae* family.

In most known cases of animal regeneration, such as with starfish and lizards, lost body parts such as arms, legs or tails are replaced by regrowing identical parts.

The difference with sacoglossan sea-slugs is that they are growing an entire new body from scratch.

The discovery was made by a team from Nara Women's University in Japan, led by doctoral student Sayaka Mitoh.

In 2018 she spotted the detached head of an *Elysia marginata* slug circling its own body in a laboratory tank and observed it, expecting it to die. Instead, she saw the wound at the back of its head quickly heal and start to be replaced by a new body.

Within days she could see a new heart beating, and 80% of the body, a perfect replica of the old one including all vital organs, had developed within three weeks.

Mitoh later found that another species of sacoglossan sea-slug, *Elysia atroviridis*, behaved in the same way.

She now wants to find out not only how the sea slugs disconnect their heads from their bodies and grow new ones, but why.

The leading theory is that it is an effective way of removing internal parasites. In the laboratory all the slugs that disconnected from their old bodies had parasites, while the new bodies were parasite-free.

Another possibility is that it could be a means of surviving attacks by predators.

Stem cells are suspected to play a part in the regeneration process. The team will now look for other sacoglossan species that might be able to regenerate.

Their study is published in the journal *Current Biology*. ■

FREDA'S DIVER DISHES



So here we are in May! Lockdown is finally over and we are diving whenever and wherever we can, to get ready for the forthcoming dive season. We can't wait to take divers out again. Here's to a great 2021 season!

Lately, this mousse has been our favourite dessert. It's so creamy you could be fooled into thinking it had double cream in it, when in fact it's just made using Aquafaba – chickpea water. The word comes from the Latin *aqua* (water) and *faba* (bean), so not only is this dish quite sustainable, it's a healthier option than the usual chocolate mousse recipe.

Aquafaba Chocolate Mocha Mousse



Ingredients

100g dark chocolate; 1 tin chickpeas; 50g castor sugar; 1 tsp vanilla bean paste; 2-3 tsp instant coffee

Method

Drain the chickpeas reserving the water (Aquafaba). Pour this into a large mixing bowl and whisk for 10-15min with an electric whisk (it's easiest with a stand-alone mixing machine). Watch it thicken and form peaks as if by magic! Gradually add sugar. It will look like meringue.

In a microwavable bowl (not plastic) melt the chocolate in the microwave on full power for 1min, stir and repeat, then keep stirring until it has fully melted. If your instant coffee is in granules, use a pestle and mortar to grind them into powder, then add this to the melted chocolate along with the vanilla paste and stir it in.

Take a large spoonful of the Aquafaba and fold gently into the melted chocolate. Then gradually add the rest, spoonful by spoonful, until it is combined, light and fluffy.

Spoon or pour the chocolate mousse into your chosen dishes and either get arty and decorate it with some chocolate fishes, as in the photo, or simply break up a chocolate Oreo biscuit and crumble on top. Leave to set in the fridge for several hours.

Top Tips

Aquafaba keeps in the fridge for up to a week, so don't feel you have to use it straight away after opening a tin of chickpeas for something else. It also freezes really well – to think, all these years we've just thrown it down the sink!

Try something different: sometimes I pan-fry a few black chickpeas in sugar until they crystallise. Then, once cool, I sprinkle a few on top of the mousse just before serving. They are delightfully delicious!

* 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. £1 from every sale goes to Oceans Plastics Greenpeace, salutay.co.uk



Pioneering archaeological diver George Bass dies

UNDERWATER ARCHAEOLOGIST George Fletcher Bass, referred to as the “father of underwater archaeology” for diving achievements that began more than 60 years ago, died on 2 March in College Station, Texas, aged 88.

Bass and his wife Ann were the founders in 1972 of the American Institute of Nautical Archaeology – the “American” was later dropped to reflect the organisation’s international stance and it became known as INA.

Bass was born in Columbia, South Carolina, on 9 December, 1932, the son of an English professor and a writer, which provided a foundation for the writing of many books often aimed at a mainstream audience.

His uncle was an archaeologist, and Bass switched from studying English to archaeology at John Hopkins University and then at the American School of Classical Studies in Greece, after becoming interested in the

subject on a trip to Sicily.

According to INA in 1960, shortly after military service and beginning doctoral studies in classical archaeology, Bass was asked by a fellow archaeologist to learn to dive.

This was to allow him to work on a Bronze Age shipwreck that had been discovered by sponge-divers off Cape Gelidonya in Turkey.

Bass took only six diving lessons including one practical at a local YMCA branch before travelling to Turkey with his new wife. He co-directed the excavation of the 30m-deep wreck for the next three months.

The successful operation became the first excavation of an ancient wreck to be carried out entirely on the seabed, says INA, and the first shipwreck excavation to be directed and published by a diving archaeologist.

Bass would later establish an underwater archaeology museum in Bodrum and, in the 1990s, INA would

establish a research centre there.

The Cape Gelidonya Wreck with its cargo of copper ingots remained the world’s oldest known shipwreck until the Uluburun Wreck was found, also in southern Turkey.

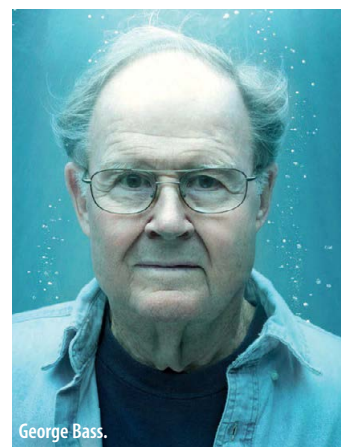
During the early 1980s, Bass’s team uncovered “an extraordinary trove of artefacts dating to the 14th century BC”, says *National Geographic*, which supported the excavation and for which Bass went on to write many articles.

In 1976 INA, by then working on four continents, affiliated with Texas A&M University. Bass became a professor there and headed a graduate programme in nautical archaeology until 1993.

He would remain an advisor to the institute until his death.

While investigating dozens of shipwrecks dating from the Bronze Age to the Middle Ages, Bass demonstrated “that the scientific rigour of land-based archaeological techniques could be replicated in demanding underwater environments by archaeologists equipped with scuba or surface-supplied air”, says *NatGeo*.

“George devoted his career to the development of new techniques for



George Bass.

INA

underwater research while excavating shipwrecks around the world,” says INA. Bass was noted for involving local archaeologists and students in his expeditions.

Ann Bass, who survives her husband with their two sons Gordon and Alan, would accompany him on his many expeditions, taking responsibility for cleaning and cataloguing artefacts, correspondence and accounting.

Bass wrote or edited 10 books, including in 1966 *Archaeology Under Water*, said to have sparked wide interest in the new discipline, and his 1975 autobiography *Archaeology Beneath the Sea: My Fifty Years of Diving on Ancient Shipwrecks*.

He received numerous awards and honorary doctorates, and in 2002 was presented by President George W Bush with the National Medal of Science, the USA’s highest award for lifetime achievement in scientific research. ■

this month DIVER likes...

Seaspiracy Ali Tabrizi’s thought-provoking new Netflix film puts fisheries in the frame as eco-enemy no 1 – it could change your diet, trust in labels and your respect for some environmental bodies too.

Tanked Up Very entertaining new autobiography from Brit diving instructor Ben Thompson, who has worked in Asia, the Caribbean and Africa but has had the sort of breath-taking adventures that go way beyond the usual “funny trainee” stories, bradtguides.com

Unhooked It’s less than a minute long, but a new video posted by United Conservationists on YouTube showing Bahamas dive-goddess Cristina Zenato removing hooks from sharks’ mouths and petting them two at a time does you good. She’s been at it for 25 years now!

Deflagration Respect to Scottish MP John Nicholson, who won cross-party approval in the Commons for suggesting that unexploded ordnance found at sea should no longer be detonated by clearance divers. The quiet “deflagration” technique avoids the blasts that harm marine life, so maybe we’ll see fewer cetacean strandings in future.

Diver dies on the Vandenberg

THE BODY OF A WRECK-DIVER

reported missing in the Florida Keys on 2 March was found 24 hours later. She was identified as Jordan Fisher, 50, from Rockport, Texas.

According to Monroe County Sheriff’s Office, Fisher had been diving the popular *Vandenberg* wreck with her husband, two other divers and a divemaster from Dive Key West’s 12m boat *Emerald See*.

The divemaster had signalled for everyone to surface after the dive, but members of the group reported losing sight of Fisher as they made their way back to the boat.

The divemaster told investigators that when he realised she was missing he carried out several searches on the *Vandenberg* until he ran low on air.

An air-sea search was carried out during the day involving Florida Fish Wildlife Conservation Commission,



Jordan Fisher.

two Coast Guard cutters, a US Navy helicopter, Air Station Miami and special forces and sheriff’s office divers.

Fisher was found on the seabed not

far from the wreck on Wednesday morning by divers from the *Sea Eagle* dive-boat from Key West.

The *Gen Hoyt S Vandenberg*, a 160m former military troop-transport and missile-tracking ship, was sunk as an artificial reef in 2009 and lies at a maximum depth of 45m off Key West.

A *post mortem* was carried out, but the sheriff’s office said that there were no suspicious circumstances. ■

Dan divers set for Euro tour



DAN EUROPE EMBARKS on a road tour this summer, aiming to promote sustainable lifestyle and corporate responsibility in the diving industry.

"With much of the tourism and sports industries stuck due to lockdowns all around Europe, some may think now it's not the best moment to launch a tour," says DAN. "However, ocean protection has long been overdue, and there's no time to lose."

Rising CO₂ levels, plastics and chemical pollution and biodiversity loss are concerns to be addressed by DAN Europe ambassadors Manuel Bustelo and Alana Alvarez. From early June to November the divers plan to use an electric vehicle to cover some 7000 miles across the continent.

They will meet policy-makers as well as divers at dive-sites, dive-centres, gear manufacturers and training agencies.

"Sustainability is a driving force globally, directing strategies and decisions now, and the diving industry is particularly concerned," says Bustelo. "We're happy to have DAN Europe embrace this project and drive the change we all need."

"As divers, we all share the love and awe for our underwater world, and want to do our utmost to protect it," adds Alvarez. Find out more at sustainabletour.eu

The Covid pandemic could yet affect DAN Europe's tour – and has already influenced its insurance strategy. It now offers a new membership option specifically supporting near-home diving.

Its Dive Local plan covers scuba and freedivers diving within their country of residence only, and includes technical divers.

It offers support with 24/7 access to the DAN Europe hotline and diving medical advice, plus access to MyDAN and its app.

"Even if some countries have a robust national healthcare system, it likely does not provide the specialised knowledge, consultancy and assistance required for diving injuries or planning, nor does it likely fully cover hyperbaric therapy should the need arise," claims DAN.

More at daneurope.org. ■

FIRST HUMANS DIVE INTO EMDEN DEEP

THE FIRST MANNED dive has been made into Emden Deep in the Philippines Trench, which is the world's third-deepest point after Challenger Deep (Mariana Trench) and Horizon Deep (Tonga Trench).

The two occupants of the submersible *Limiting Factor*, American owner-pilot Victor Vescovo and Filipino marine scientist Dr Deo Florence Onda descended to 10.045km on 29 March on an expedition led by EYOS Expeditions.

"It's rare in this modern age to be able to genuinely explore; to go where no human has ever been before," commented expedition leader Kelvin Murray.

"The potential discoveries in these places are going to be very interesting and every dive seems to yield something new and exciting."

Not that there turned out to be very much to see at the bottom of the Philippines Trench. The descent took four hours and the divers spent three hours on the seabed, covering more than 2km of undulating soft sediment. Visibility was reported to be excellent but little marine life was



Victor Vescovo and Dr Deo Onda after their epic 10km dive.

EYOS EXPEDITIONS

evident – Vescovo described the view as "peaceful". *Limiting Factor* took 3.5 hours to ascend back to its mother ship *Pressure Drop*.

Dr Deo Onda is a microbial oceanographer at the University of the Philippines' Marine Science Institute. "This was a once in a lifetime opportunity, a chance to see the Philippines Trench for the first time and to carry the flag of our nation with me," he said. "We are a maritime nation, yet this hidden recess of our maritime environment has remained unexplored until today."

The area was discovered by crew of the German ship *Emden* in 1927.

Vescovo's Triton 36000/2 submersible was the first certified to dive to unlimited depths. Using the craft he had already become the first person to reach the deepest point in each of the world's five oceans in 2019. Last year's Ring of Fire Expedition included further dives to Challenger Deep, lying at 10.9km.

Another dive into Emden Deep was to be carried out on 30 March with Prof Alan Jamieson, an expert on the Hadal Zone (below 6km). ■

Diver photo ops – Close-up and World Oceans Day

CLOSE-UP PHOTOGRAPHER

of the Year (CUPOTY) is a competition that celebrates close-up, macro and micro photography from around the world – and now it has zoomed in on divers by launching a new Underwater category.

The category winner collects £300 and the chance of winning the £2500 grand prize. Total prize fund is £5300.

The Underwater category, sponsored by Seacam, covers images of flora and fauna and has been introduced to reflect the quality of entries in the genre in the two previous years of the contest, says organiser Dan Calder. The 2020 contest attracted more than 6500 entries from 52 countries.

The Underwater category judging panel consists of David Doubilet, Jennifer Hayes, Darren Jew and Nadia Aly.

The other eight categories include Animals, Manmade, Micro and Young CUPOTY, for entrants of 17 or under.

The contest, held in association with software company Affinity Photo, is open to all, and accepts



The 2020 CUPOTY winner, eel larva on a blackwater dive in Lembeh, Indonesia by French diver Galice Hoarau, was entered in the Animals category.

images taken with any type of camera or phone. Photographers have until 23 May to enter, cupoty.com.

Longer-established is the UN World Oceans Day Photo Competition, which is going ahead for the eighth year in a row but remains open for entries only until 30 April.

The contest is curated by underwater photographer Ellen Cuylaerts, who asks: "What better way to prepare for new, maybe local, adventures and images than diving into your image library and entering the competition, while contemplating how we can make a difference and contribute to conservation and preservation of ocean life and livelihood?"

Categories are the established Above Water Seascapes, Underwater Seascapes and Digital Ocean Photo Art alongside three new ones: Ocean Life & Livelihood, Faces of the Sea and Oceanic Discoveries.

Entrants sign up to a charter of ethics in underwater photography: "We hope that this charter will be an example for many competitions around the

world," says Cuylaerts.

The six judges are Jennifer Hayes, Julian Lennon, Afelandra Glez Cibrián, Joakim Odelberg, Ipah Uid Lynn and Michel Strogoff.

Winners are announced on World Oceans Day (8 June), unworldoceansday.org/photo-competition. ■

Fight is on to protect UK seagrass

AS MUCH AS 92% of the UK's underwater seagrass meadows have been lost, according to new research that calls for urgent action to be taken to help restore them.

The study, a collaboration between University College London (UCL), Kings College London and Swansea University, is said to be one of the first to use seagrass data from diverse sources to produce a systematic estimate of the marine plant's extent both historically and today.

Growing in shallow coastal areas, seagrass is vital to healthy marine ecosystems, say the scientists.

It supports fish stocks, provides seahorse breeding grounds and also removes CO₂ from the atmosphere.

Although covering only one-thousandth of the world's seabeds, it can absorb and trap carbon up to 40 times faster than forests can.

At least 44% of the UK's seagrasses have been lost to industrial, agricultural and coastal development since 1936 – with 39% of that loss occurring since the 1980s.

The figure is 10% higher than the average estimated global loss.

Had UK seagrasses remained at pre-1936 levels, they could have stored 11.4 megatonnes of carbon, or 3% of the UK's CO₂ emissions in 2017, say the researchers, and supported some 400 million fish.

Huge areas of the Humber and estuaries in Essex and Suffolk have lost seagrass, as have rural locations on the east coast of Anglesey in Wales, Cromarty Firth in Scotland and the inlets and estuaries of Cornwall.

Only 8500 hectares now remain, says the study, though it recognises that some sites are showing signs of recovery.

Healthy meadows remain at sites such as Studland Bay in Dorset, Lindsifarne, parts of Devon and the Scilly Isles, while in places such as Dale



A pair of seahorses in Studland Bay.

NEIL GARRICK-MAIDMENT / SEAHORSE TRUST

Bay in Pembrokeshire the Seagrass Ocean Rescue project has been working to reseed the seabed.

"Seagrass is the most wonderful unknown marine habitat out there, but it's declining worldwide," says lead author Dr Alix Green of UCL Geography.

"In the UK, healthy examples of these flowering plants form dense lush green meadows, with long green strands up to 2m in height, in waters that are beautifully clear because of the plants' cleaning properties.

"They're also home to fish eggs and larvae of species important to our commercial fisheries such as cod, flounder and mullet. They form the only known breeding grounds for two seahorse species found in the UK and, if you're lucky, you'll spot enigmatic dogfish and huge crabs roaming among these meadows."

While scuba-divers in particular will appreciate such aspects, Dr Green also points out that seagrass beds "protect the shoreline from coastal erosion by absorbing the impact of storms – a service that will be vital in our changing climate."

"The next decade is a crucial window of opportunity to address the inter-related crises of biodiversity loss and climate change – the restoration of seagrass meadows would be an important contribution to this," says co-author Dr Peter Jones of UCL.

"This will involve restrictions such as reduced boat-anchor damage, restricting damaging fishing methods and reducing coastal pollution, including through Marine Protected Areas."

"The catastrophic losses documented in this research are alarming but offer a snapshot of the potential of this habitat if efforts are made to protect and restore seagrass meadows across the UK," adds Dr Green.

"We hope that this work will spur continued, systematic mapping and monitoring of seagrass meadows across the UK and encourage restoration and rehabilitation projects... The UK is lucky to have such a resource in our waters, and we should fight to protect it!"

The study is published in the journal *Frontiers in Plant Science*. ■

Free rides on seahorse course

UK-BASED CHARITY the Seahorse Trust has launched an online version of its established seahorse biology, ecology and conservation course, and says that 10 free places are up for grabs.

Alongside campaigning efforts to protect marine areas and end the illegal trade in wildlife, the trust says that its core objective is education and awareness-raising.

It has offered in-person courses for many years, using seahorses as "a lens through which to explore broader topics of the marine environment and how we can protect it".

UK conservation charity Sea-Changers provided a grant to help launch the online course.

"One of the Seahorse Trust's driving purposes has always been to foster connections with the marine environment and to allow as many as possible to experience the opportunities and the physical and mental well-being benefits that connection brings," said Seahorse Trust founder executive director and diver Neil Garrick-Maidment, announcing the move.

"In facilitating the online accessibility of our educational resources, Sea-Changers has allowed us to reach a much wider potential audience."

The course comprises 12 modules and costs £65, though an introductory session is free.

Information on signing up and applying for the "Be A Sea-Changer Learner Grant" can be found at theseahorsetrust.org.

Sea-Changers is partly supported by diver contributions, seachangers.org.uk ■

MORE THAN 3000 scientists, politicians and public figures

have so far signed a call to world leaders for international climate policy to include protection and restoration of ocean and coastal ecosystems.

The open letter, led by the Environmental Justice Foundation (EJF) and supported by 66 partner NGOs, is to be presented to governments around the world in September ahead of the COP26 climate talks in Glasgow.

Divers are asked to join others in adding their signatures. Protecting the "blue carbon" contained

Signatures sought for Blue Carbon letter

in thriving ocean ecosystems is key to tackling climate issues, says the letter.

The oceans contain some 49 times more carbon than is in the atmosphere, and more than half of biological carbon is captured by marine wildlife. This presents a major risk if left unprotected, as now.

The letter makes three demands on national leaders: to set specific legally binding targets to protect and restore blue carbon environments; to commit to the 30-30 ocean protection plan,

representative Marine Protected Areas by 2030; and to agree an international moratorium on deep-sea mining.

Restoration and protection of marine habitats has to take place alongside ambitious decarbonisation across all sectors, says the letter.

"The ocean gives us every second breath we take – and absorbs around a third of the CO₂ we pump out," says EJF executive director Steve Trent, act.ejfoundation.org/bluecarbon ■

which would designate 30% of the ocean as ecologically

SCOTTISH SUPERDADS

Don't let me hear you moaning that your dive was on the nippy side. Commercial divers were praised for exceeding the call of duty in early March, when the Western Isles were in the grip of their coldest spell in 25 years.

Intakes from the lochs were freezing up and threatening folks' water supply, so Scottish Water called in the divers.

Two teams ended up keeping constant watch in Loch Fada for more than 48 hours.

Mark MacInnes from the operator NDUS, one of the first divers in, said that water temperature was down between -3 and -4°C, which I didn't think was possible, and vis was about 10cm.

They initially worked through the night, clearing intakes with their hands.

"There are filter screens with fine holes to stop debris being drawn into the pumps," Mark reported. "As soon as slush from the loch was coming into contact with the screen, the holes were icing over... one side of the screens was freezing over as fast as you could clear the other."

So what kept them going? Easy, it so happened that all of Mark's team were new dads. "We've all had some training for being up at all hours through the night and getting by with little sleep," he said.

Nice break for the lads, then.

Rock run, anyone?

They're tough in Ireland, too, but don't rush to copy this underwater activity, which makes me weary just to think about.



Scuba and ski instructor, karate black-belt and IT company director Dave Kerr from Co Wicklow is an "underwater rock runner" in his spare time, of which he finds enough to be able to heft boulders around the seabed most days – just for kicks.

The pursuit caught on with surfers in the 1990s apparently, as a way of learning to cope with being submerged for extended periods following a wipe-out.

So you duck-dive to the seabed at around 6m, grab a 20-25kg rock and go for a run – we hope not doing too much harm to marine life beneath your flying feet.

Dave, 54, goes out most mornings with his mate Brian after their daily swim. He told the *Irish Times* that these desperate dashes make him feel energised and tingly – that'll be the hypoxia, I guess – and shallow-water black-outs must be a risk, which is why he stresses that it should never be done alone.

Dave has scuba-dived for 40 years but it



was only last year that he did a course and became enthused with freediving.

His static apnea PB is 3min 45sec, which isn't bad, and he can do 83 steps in about 90 seconds. Long-suffering wife Sharon says she "just puts up with Dave's weird sports activities".

Nuptial fumble

This magazine receives more reports of divers recovering lost phones, cameras and jewellery than it would ever have time or inclination to share, but some of these stories have interesting twists.

Certainly it can't have been often that a couple manage to lose a wedding ring under water during the service itself.

That takes some genius, but Andrew & Marlee Kent, as they now are, managed it while tying the knot on a pier in California's



mountain-set Lake Tahoe. The nervous groom fumbled the ring thing, and the couple ended up on hands and knees, peering through the gaps in the planking.

Distraught Andrew was all set to take a giant stride into the 5°C waters, and had to be restrained by the clergywoman.

So the couple turned to social media,



As someone who feels the effects of cold water quite keenly, I am intrigued by all these recent under-ice record bids, often made by distinctly under-dressed freedivers, like David Vend above.

I was also interested in some recent research that reveals that tolerance for low temperatures is inherited.

I knew it, I'm not a wuss after all – it's just my warm genes!

ACTN3, a common genetic variant in skeletal muscles, means that some folk simply aren't at all bothered by the cold – and when I say some, I mean as many as one in five.

These people lack a muscle protein

because of a single change in that ACTN3 gene. If you're one of them, as many of you must be, your body can maintain a higher-than-average core temperature, so you shiver less.

Numbers of such cold-resisters swelled as the human race migrated out of Africa and into colder northern climes.

The study was limited to men, and the scientists now need to find out if the same applies to women.

I don't know if there's a test you can take to check your own status, but if you find yourself attracted to iceberg-diving you're probably alpha-actinin-3-deficient. Enjoy!

where they connected with regular lake-diver Phill Abernathy.

I think Phill might have played up the story of the jewellery recovery a bit for the TV cameras, what with the cold, the current (really?), the silt and even a battlin' crayfish he had to fend off after finding it guarding the ring under some rocks, but all was well that ended well.

Now that's one marriage in which things can only get better.

Scuba mule

"Scuba Steve" is an American thing. It started as the name of a toy in Adam Sandler's panned but popular 1999 movie *Big Daddy*, but **DIVER's** Editor, also a Steve, feels that the nickname is now tiresomely over-used.

Most recently it has been applied to diving delinquent Glen Mousset (see, not even christened Steve).

Canadian Glen, 49, was arrested last year when things were already looking pretty bad for him. He had just been found floating unconscious in scuba-gear in the Detroit River, tethered to 84kg of marijuana. That's some weight-belt.

The diver had been smuggling drugs and cash over the US-Canadian border using a fleet of Seabob DPVs. It was the border agents who pulled him out who dubbed him Scuba Steve on social media.

A few weeks earlier, Glen's truck had been pulled over in Michigan, loaded with \$100,000 in cash. He initially agreed to help the cops bust fellow-smugglers, but instead escaped back to Canada.

And now here he was, in the USA again and lucky to survive the experience.

Scuba Steve's criminal status remains a matter of contention – according to prosecutors he headed an international smuggling ring, while his lawyer described him less flatteringly as a low-level drug mule.

Either way, SS is serving a six-year jail term. I feel another movie coming on...



Diver Steve

The Editor might be snobby about these Scuba Steves, but he's been grinning from ear to ear about having a manta ray named after him by the Manta Trust in March.

So when you get back to the Maldives, look out for Diver Steve – you can't miss him, a male, big and spotty and, if he's anything like his namesake, wearing a self-satisfied expression.

UNDERBATHWATER WORLD

Photo contest captures lockdown mood – and divers' levels of invention

IT WAS DIVE-EQUIPMENT company Fourth Element that came up with the clever idea of the Underbathwater Photography Competition during the first coronavirus lockdown – but the follow-up in 2021 really unlocked divers' pent-up creativity.

Hundreds of entries were said to have been submitted, shot in bathrooms around the world.

The categories were Covid-themed: Self (isolation) Portrait, Lockdown Lego, Zoom In (Macro – close-up), Indoor Animal Behaviour and Positive/Negative (black & white).

“What began as a crazy idea has quickly grown to become something that has encouraged some remarkable creativity and certainly created unique images shot during a very challenging period,” said Fourth Element co-founder Jim Standing, whose brainchild it was.

“The standard was considerably higher than the previous year. Participants went to extraordinary lengths to capture their perfect images and, in many cases, the behind-the-scenes images and the back-story were as impressive as the photos themselves.”

The photos were judged by underwater photographers Alex Mustard, Saeed Rashid and Standing. They were said to have had a challenge to pick even a shortlist from the array of imagery.

“This competition gave some underwater photographers the opportunity to unleash their creativity, work on their skills, perhaps familiarise themselves with new equipment, or merely have fun,” said Mustard.

And Rashid added: “It was great to see photographers enjoyed getting in touch with the creative processes in a way that would never have happened if we hadn't been forced to take extreme measures to protect ourselves and each other during the pandemic.”

The contest was supported by Underwater Visions and Paralenz. The winning entries can also be seen at fourthelement.com



1 Overall Winner (Amateur) Barry McGill

A diving instructor and technical diver, McGill spends much of his time diving off the Irish coast and the judges said they were really taken with the feeling of authenticity that he achieved in creating a scene in Lego capturing the gloom of low visibility with the excitement of seeing objects, people and the seabed resolve from the murk.

“Anyone who has tried to control the

buoyancy of Lego in the bath (and there were many) will know how difficult it is. To control this many elements in one image is nothing short of masterful,” they said.

2 Overall Winner (Pro) Mikko Paasi

Paasi, one of the cave-divers who participated in the rescue of the 13 Thai footballers in 2018, was the 2020 winner. He created the image in a hotel room in Jakarta while in quarantine, using

materials that came to hand: his daughter's modelling clay served to create a boat and a polar bear, while hotel towels and nappies produced the ethereal ice-cave effect.

“The almost perfectly still surface with associated reflection showed the control that was needed in a race against time before the modelling clay dissolved,” said the judges.

“The result, rotated through 180° to create the surface of the sea, is stunning.”





3 Lockdown Lego Winner Mocean Images

"This image was breath-taking – not least because the judges had all seen real images that this sought to emulate. The use of materials to create the hole through which the light streamed was ingenious, and the effect left the judges wondering how such depth was achieved," said the judges. "It is quite an achievement to create an image using a Lego figure where your first instinct as a diver is to want to go and dive there!" said Standing.

4 Self (isolation) Portrait Winner Tony Reed

While not exactly under bathwater, this image took a very different approach to the category, said the judges, telling the story of the experience of life in lockdown during the pandemic.

"It seemed logical, although a logistical challenge, to use a toilet for this purpose.



The face in question has two distinct sides – as the photographer's narrative explained – to show that people have experienced lockdown in different ways, not all of them positive.

"The lighting, leaving the left-hand side of the face shadowed, lends a solemn air to the image."

5 Zoom In Winner Arnau Argemi

The judges commented that this category was dominated by nudibranchs and the recreation of scenes often shot in the real world. "There were so many contenders that managed that near- facsimile of the real thing – but what stood out were those that added a little something extra."

The interaction of the eye contact between the anemonefish and her "eggs" is where the judges felt that the winning photo succeeded in bringing an added dimension to this bid to mimic one of



Mustard's own ocean images.

"The negative space framed by the ingenious use of what looks like Christmas baubles as eggs draws the viewer in, before realising that this shows toys in the bath."

6 Positive/Negative Winner Laura @lgx_95

"This photo is as much about the nature of the competition as it is about the image itself," said the judges. They enjoyed that the diver and shark silhouettes appear to be circling the bath drain, "which lends an additional dimension to this image that,

according to the photographer, attempts to capture the dreams of dives before lockdown".

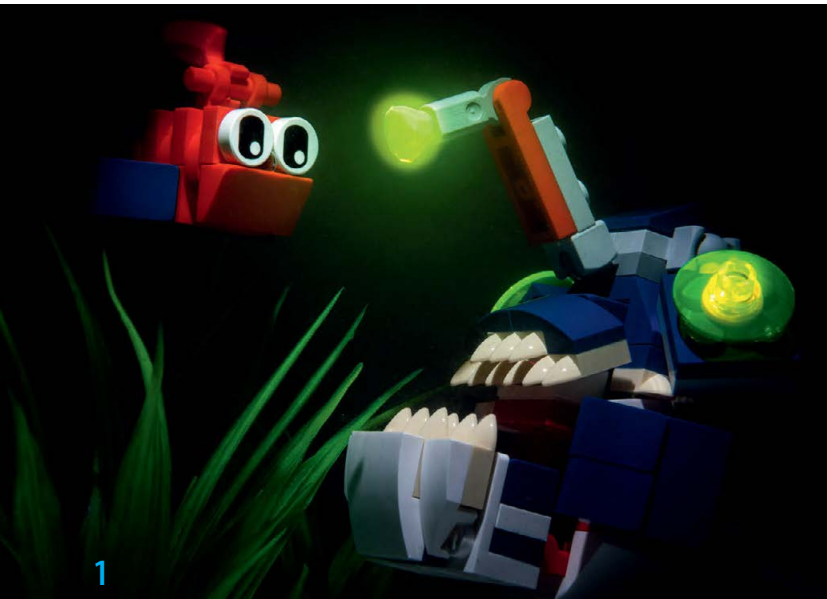
7 Indoor Animal Behaviour Winner Pia Bercic

"Timing is everything. The brightly coloured octopus (made from a fishing lure) against the dark background of swirling ink created a dramatic image, which leapt out of the screen.

"The photographer also submitted the video showing how the shot was taken, demonstrating the creativity and timing needed to capture this image."



Underbathwater Photography Competition 2021 – HIGHLY COMMENDED entries



1 Lockdown Lego Tro Rex

“This close encounter has great composition and made the judges smile. Here the creativity was not so much in the construction (the photographer used a standard Lego set) but in the great use of lighting and a wonderful juxtaposition of predator and prey.”

fluorescing make-up to achieve a dark yet ethereal effect,” said the judges. They were impressed not only with the effort that went into setting up this image, but also with the creativity in capturing the smoke-like wisps as the make-up washed off. “A highly accomplished unique image.”



2 Self (isolation) Portrait Elly Wray

“The control required to achieve this still surface interface is phenomenal, especially considering the model had to keep both eyes open, one of which was actually crossing the surface. The blue bathtub gives a very clean effect, allowing the face and its near perfect reflection to stand out.”

3 Self (isolation) Portrait Pia Bercic

“This unique image uses both UV lighting and

4 Zoom In Tro Rex

The cheeky humour of this photo – a recreation of many real underwater images, made the judges smile, but it was the addition of the tiny bubble reflecting the eyes of the fish that they said “elevates this image into something more than a bit of fun”

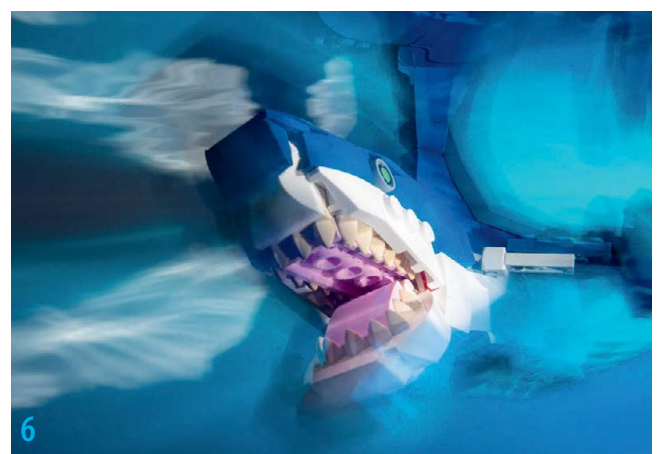
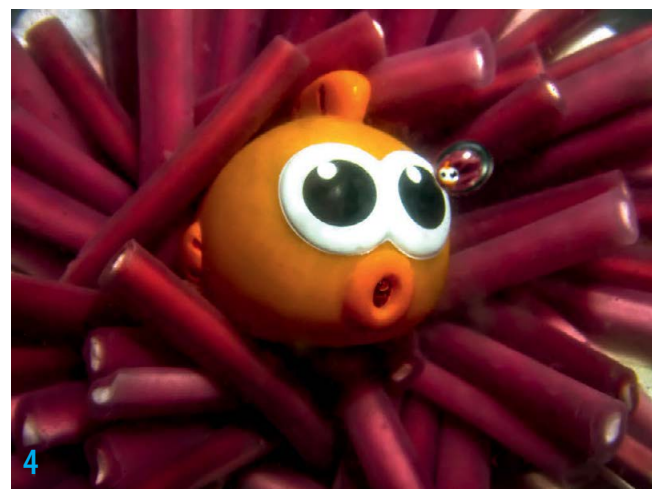
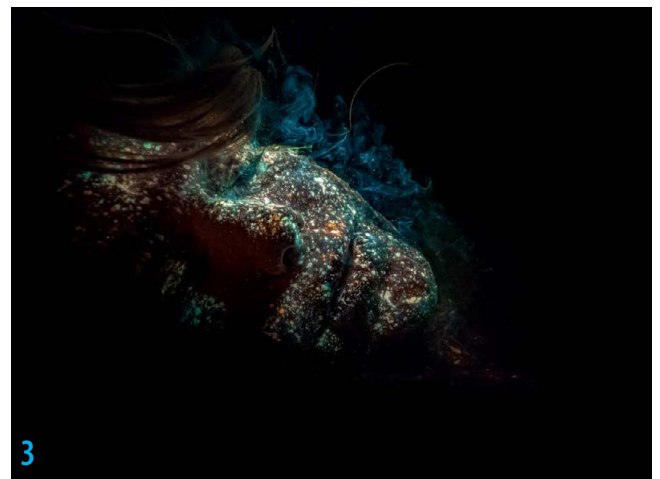
5 Positive/Negative @une_plongeuse

There were several attempts to create photo-realistic images, especially in the Animal Behaviour category, but this one, presented in black and white, required a double take, said the judges. This revealed that the ice in the background was in fact plastic bottles and the subjects were models.

“The position of the orca was so life-like that the only giveaway was the still surface of the water capturing the reflection so well.”

6 Indoor Animal Behaviour Arnau Argemi

“This recreation of a classic image is given the full Underbathwater treatment by the use of Lego. A close contender in the lockdown Lego category, the image suggests motion beautifully and it’s almost possible to ignore that this is in fact a toy.”





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We all need to get away and HENLEY SPIERS has managed it. He explains why the Maldives remains hard to beat...

FROM THE AIR it looks heavenly: sandy circles engulfing turquoise water, surrounded in turn by a deep blue sea.

Millions of years ago, I would have been looking down at a chain of volcanoes, rising from the depths. Today, the ocean has swallowed those volcanoes, with only their fringing reefs left behind.

The island atolls that form the Maldives are among Nature's greatest views, and rousing yourself to a window as the plane makes its approach is an essential start to the experience.

Only 40 minutes after leaving the airport, our private boat-taxi docks at the Holiday Inn Kandooma Resort Maldives.

This will be home for the next 10 days, and my excitement is quickly washing away the jet lag.

Kandooma Thila is rightfully regarded as one of the premier dive-sites in both South Malé Atoll and the Maldives as a whole.

Here, it's effectively our house-reef, fewer than five minutes away. The water is 28°C and, although I packed a wetsuit, my dives will be spent in a rash-vest and board-shorts, soaking up this first dose of tropical waters in a long time.

Kandooma Thila (*thila* means underwater seamount) sits in a channel where currents wash over it at speed. The water-movement patterns of the Maldives are so particular that dive-guides here discuss them with the same regularity and concern as the British do weather.

The most important question is whether the tide is incoming or outgoing,

followed by its strength. These patterns are not dictated by the moon in the way that we are familiar with back home, so it's a constant process of evaluation.

We drop in upcurrent, descending fast into the blue, trusting the instincts of our guide as we fin after him and the trail of bubbles.

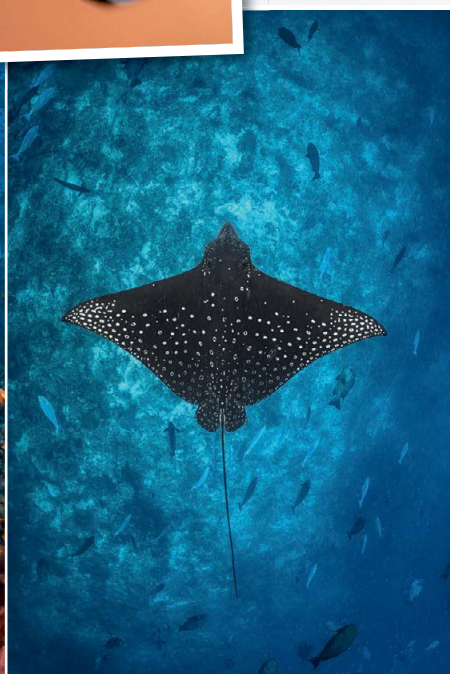
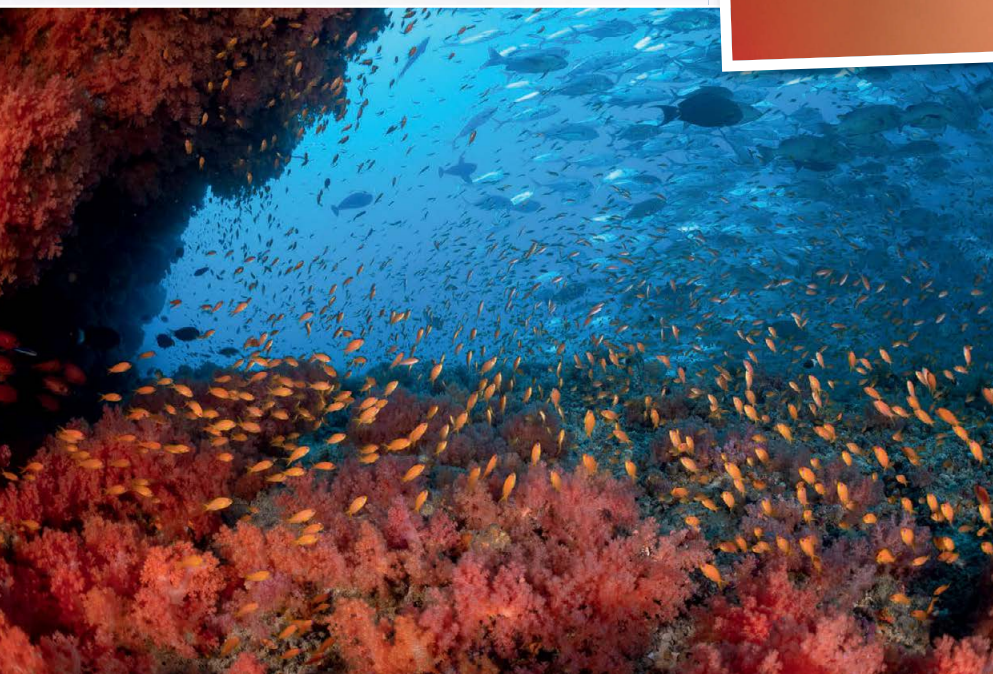
Soon after, the edge of the seamount comes into view and we become more aware of the speed of the water.

To get the most from scuba-diving the Maldives, you should be comfortable diving in strong currents at 20-30m.

We bolt towards a rocky outcrop, taking shelter under a ledge.

Catching my breath, I become more aware of the surroundings, eyes taking in a garden of soft corals, pulsating with colour.

Orange anthias dance in formation above the pinkish coral, grouped



tightly by the current. Beyond them, fully exposed to the raging water, a school of jack march on, impervious to the flow.

My entire line of sight is full of fish. It's a jaw-dropping scene, and one far too rare in today's oceans.

THE MALDIVES BOAST the world's largest population of reef mantas. My visit comes just at the tail-end of the rainy season, a time when the rays visit South Malé Atoll for a planktonic feast.

Cruising between dives, our manta look-out quickly sights a dark fin-tip breaking the surface. No need for a tank on this one. I jump in for the first of many snorkels with mantas, watching with glee as they make their rounds, vacuuming up the water as they go.

If you don't find them feeding close to the surface, there are nearby cleaning stations to check out on scuba.

South Malé is also where I've enjoyed my best encounters with spotted eagle

rays, and we meet them on every dive at Kandooma Thila (definitely not a one-and-done kind of dive-site).

Although mantas enjoy star-billing in the world of rays, I'm actually fonder of eagle rays. The spotting pattern on each one is completely distinct, the equivalent of a human fingerprint, and their extended nose hides a wry smile beneath.

We are blessed with so much time in the water with them that I can experiment with multiple photographic angles, and even become picky about pursuing those with the most spots!

Hygiene is an integral part of fish life and the impressive fish biomass in these waters means that you're never far from underwater cleaning behaviour.

In fact one of my key takeaways from this trip was that the Maldives is the best place I have visited yet in terms of photographing cleaning behaviour.

The number of fish and their relative ease around divers adds up to a perfect



recipe for getting close enough to shoot this intriguing behaviour.

The grunt work is usually carried out by cleaner wrasse or shrimp, and my preference is for the latter.

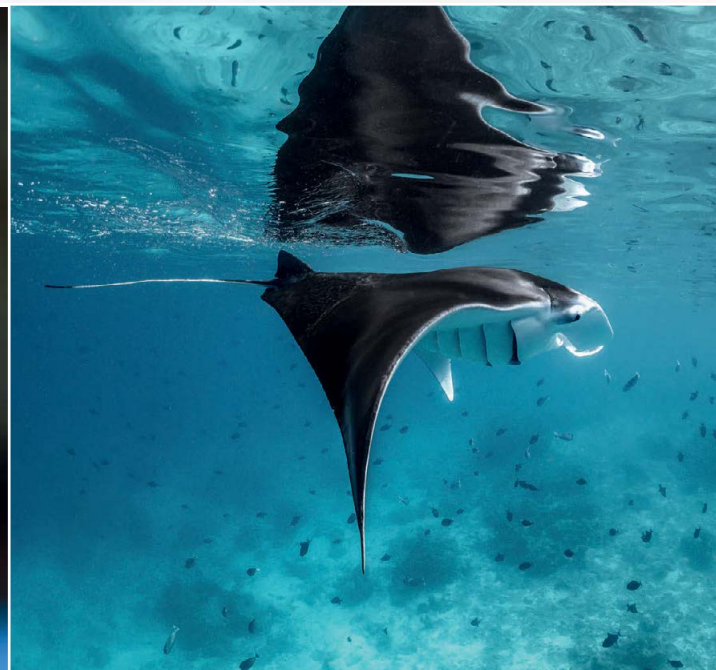
At Lhos Fushi, I watch as a blue-spotted coral grouper opens wide, allowing access to a goggle-eyed shrimp.

Skipping to its task along the grouper's serrated teeth, the shrimp enterprisingly carries out its symbiotic duties within an arm's reach of the camera.

Above: Decorated dartfish.

Below, from far left: The scene at Kandooma Thila; spotted eagle ray; grouper enjoying being groomed by a shrimp; manta ray near the surface.

Inset on opposite page: Juvenile angelfish.





Above: Blacktip reef shark.

Right: The abiding attraction of anemones.

Below: Nudibranch.

Bottom, from left: The Fish Tank site; porcelain crabs stand out on the reef.

In between maximising water time, we fill our bellies with a delicious array of food, and enjoy the resort's laidback, family-friendly atmosphere.

Holiday Inn Kandooma is popular among surfers as well as divers, with a house wave right out from the rooms.

I enjoy a few dive intervals with my camera in the surf, catching the waves as they roll in (and trying not to break myself or my gear in the process).

There are also sites close to home where the currents are mild to non-existent, which is

a pleasant change of pace, especially for the purposes of underwater photography.

Kuda Giri is a 40m-long cargo vessel, sunk for divers, and you



reach the top of the bow at around 15m deep. By the time you get to the stern, the bottom is at 30m.

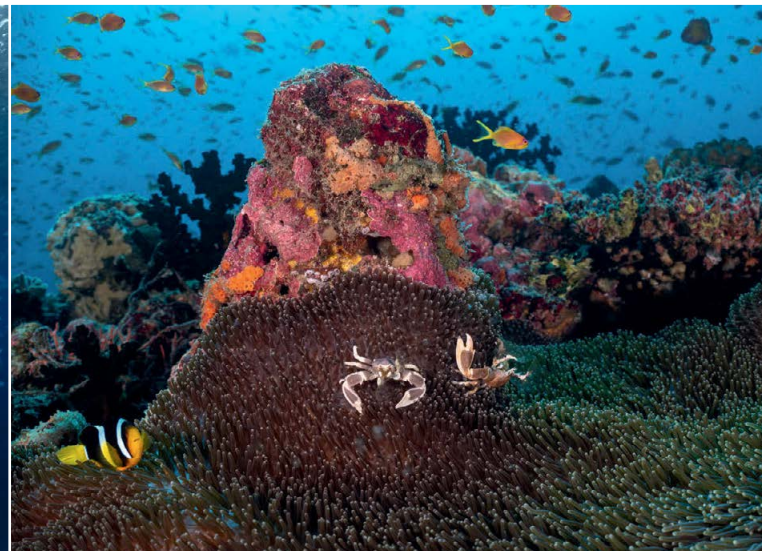
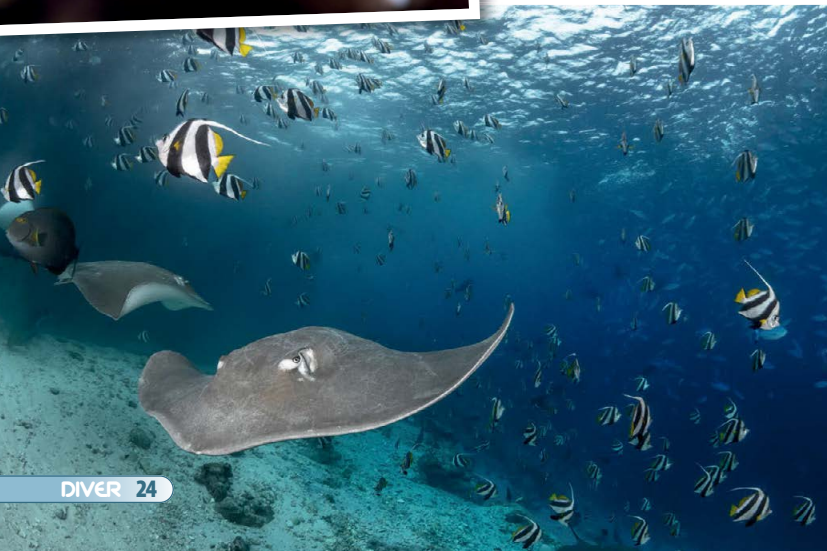
As an upright, mostly intact shipwreck, there are good possibilities for wide-angle shots with models. For those more interested in the marine life, longfin bannerfish are reliably found around the structures at the rear of the wreck.

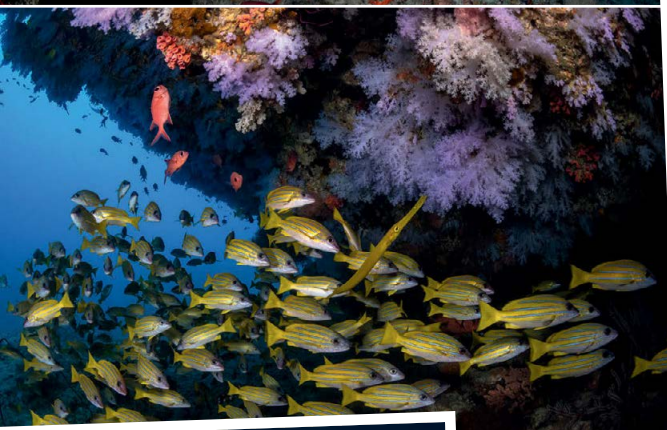
At Bodu Fushi, the sea has carved an impressive, circular arch into the wall, with squirrelfish and grouper hiding in

its shadow. Further along, glassfish fill the nooks and crannies of the reef and, looking closer, I spy a cleaner shrimp bouncing along their backs.

AN EXCURSION to North Malé Atoll unveils the unforgettable purple soft corals of Nassimo dive-site.

These resplendent, mauve corals hang like grapes from the underside of every rockface, a perfect colour match for the large school of blue-stripe snapper.





Within their number, a yellow trumpetfish tries to conceal its presence.

Another patch of purple soft coral hides a giant moray, mouth ajar as blue-streak cleaner wrasse tend to its needs.

A crown triggerfish passes close, a longtime contender for my title of favourite fish. These fish come in a bizarrely alluring blend of black body, white blotches and orange-ringed mouth.

We end the day with a late-afternoon dive at Fish Tank, timed to coincide with

the tuna factory on shore dumping fish carcasses off the end of the jetty. We divers wait by this structure as the current rushes through, and carnage ensues.

Large sting rays dominate the action, accompanied by a throng of schooling bannerfish. Honeycomb morays dash in for scraps before retreating back to their burrows. It's fast, it's frenetic and, despite having high hopes for this dive, I find it a bit much after the natural beauty and serenity of Nassimo.

On another day we head south, to neighbouring Vavau Atoll. The water is glassy and dolphins ride our bow.

Spirits are high as we drop in for our first dive at Fotteyo. Stretching for more than 30 miles, this is the longest unbroken barrier reef in the whole of the Maldives.

A school of batfish greet us as soon as we hit the water, and they escort us for the entire dive, all the way through to the safety stop.

Our newly found pancake-bodied friends accompany the exploration of the wall, which is hollowed out into a number of impressive overhangs and swim-throughs.

Here the soft coral comes in neon green, inflating its body when feeding on plankton from the water column.

It's yet another spectacular dive-site on a trip full of them, and we're lucky to have the whole area to ourselves, with no other dive-boat in sight.

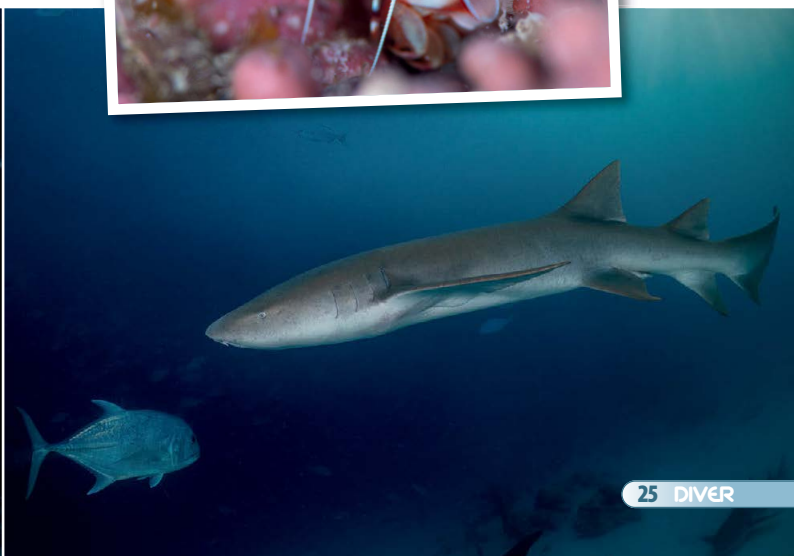
It's so good we dive it twice, before spending our surface interval snorkelling at the Keyodhoo shipwreck.

Above, clockwise from top left: Diver framed in an arch where bigeyes shelter; batfish at the Fotteyo site; clown triggerfish among purple soft coral; clownfish; trumpetfish among blue-stripe snapper.

Left: Longnose butterflyfish.

Below: Mantis shrimp.

Bottom, from left: Midnight snapper; nurse shark.





Above: A turtle rests on the colourful reef.

Right: Nudibranch.

Below: The resort at dusk.

This Instagram-friendly wooden wreck is believed to be an abandoned Indonesian fishing-vessel, now lying in shallow water with its bow piercing the surface. A shoal of sardines flits around its structure, while emperor angelfish explore the rubble below.

It's a fantastic place to off-gas, with a multitude of photo opportunities.

The elation of our day so far holds back any feelings of tiredness, and we head over to Alimatha as the sun begins its descent. This is a very famous and popular dive in the Maldives, because the site is rammed full of large nurse sharks.

Many will run it as a night dive, but I prefer to drop in while there is still some

daylight, allowing you to take in the scale of the scene. The nurse sharks started aggregating here because the resort would throw food scraps off its jetty, and some visitors still feed the sharks, but we were not among them.

The human interference is unfortunate but the dive itself is rather special. The nurse sharks writhe around us by the dozen, with tiny yellow pilotfish perched just above their noses.

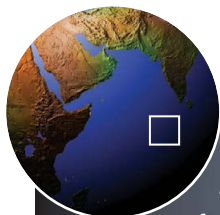
The site's blacktip reef sharks look tiny compared to the behemoth nurse sharks.

Fierce-looking giant trevally patrol around them, with the black-coated males especially intimidating. They are capable of impressive acceleration in pursuit of



the swirling fusiliers.

With clear water, and an abundance of big scenes to photograph, the temptation is to shy away from a macro lens, but I dedicate a few dives to appreciating the smaller things, and am rewarded with some unusual finds.



FACTFILE

GETTING THERE ▶▶ BA flies direct to Velana International Airport from November to March.

DIVING & ACCOMMODATION ▶▶ Holiday Inn Kandooma Resort Maldives & in-house dive centre, ihg.com/holidayinnresorts

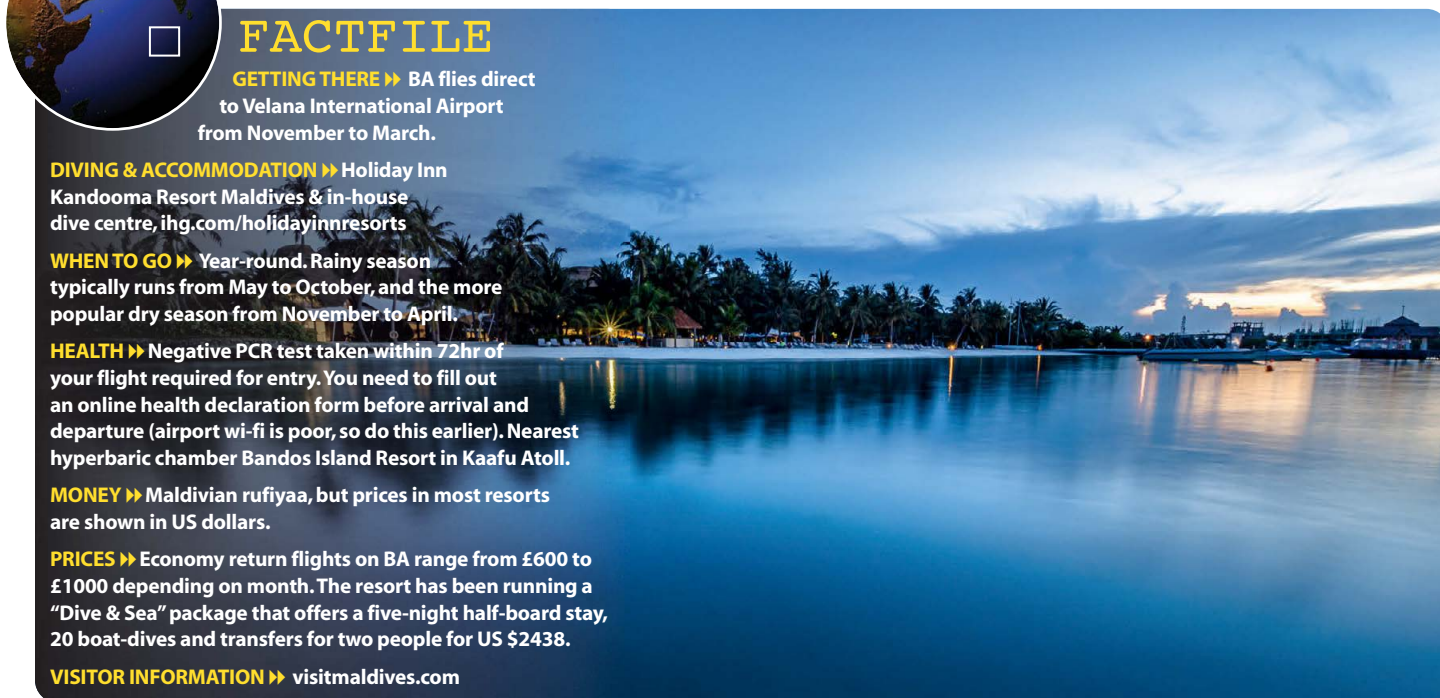
WHEN TO GO ▶▶ Year-round. Rainy season typically runs from May to October, and the more popular dry season from November to April.

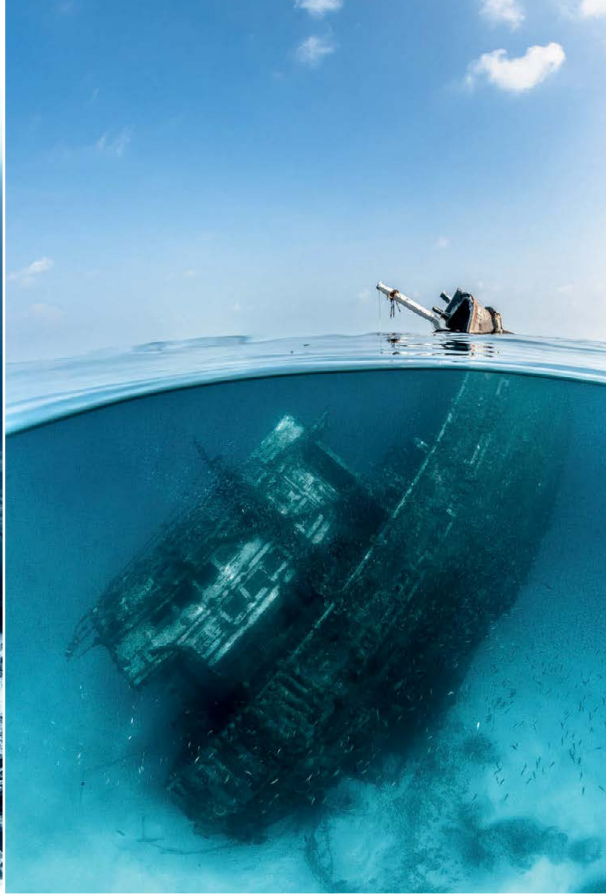
HEALTH ▶▶ Negative PCR test taken within 72hr of your flight required for entry. You need to fill out an online health declaration form before arrival and departure (airport wi-fi is poor, so do this earlier). Nearest hyperbaric chamber Bandos Island Resort in Kaafu Atoll.

MONEY ▶▶ Maldivian rufiyaa, but prices in most resorts are shown in US dollars.

PRICES ▶▶ Economy return flights on BA range from £600 to £1000 depending on month. The resort has been running a "Dive & Sea" package that offers a five-night half-board stay, 20 boat-dives and transfers for two people for US \$2438.

VISITOR INFORMATION ▶▶ visitmaldives.com





Decorated dartfish reside from 28 to 68m, and it's tricky to find them within the upper reaches of that range.

At Kandooma, however, the guides know of a couple of nearby individuals, all firmly within recreational diving reaches (and the national law preventing dives beneath 30m). Sporting remarkable violet and red markings, this attractive fish also wears a permanent pout.

The dragon-like yellow-mouth moray is another intriguing find, with a starry exterior, toxic skin and a resplendently yellow mouth-interior.

THE MALDIVES IS hardly a secret dive destination. Its unusual situation and marine treasures have been appreciated since the dawn of scuba, with both Hans Hass and Jacques Cousteau pioneering the thrills of its diving experiences.

The country's coral reefs suffered



mightily at the hands of severe ocean-warming events in 1998, and again from 2014 to 2016.

The shallow hard corals throughout the Maldives are almost all dead as a result.

This is the kind of news that might go unnoticed in the wider press, but quickly sweeps through the dive community.

Raise the subject of the Maldives with divers today and there is a good chance

that phrases such as: "It used to be great, but it's finished now" or "It's all dead" will be uttered.

Well, I've visited the Maldives four times in the past three years, as well as many of the world's other top-rated diving locations, and I can happily confirm that it remains a world-class diving spot, one that is perhaps becoming underrated at this juncture.

Yes, you need to go below 10m to find the healthy corals and, yes, there are continuing concerns around the environmental effects of climate change and land-reclamation projects.

However, if it's a great, tropical diving destination that you're after, the Maldives remains right up there at the top of the table. █

Top, from left: The Kuda Giri wreck; the Keyodhoo wreck, its bow clear of the water; yellowmouth moray.

Above, from left: Cleaner wrasse work on a sweetlips; another view of the Kuda Giri.

Left: A pair of gobies.

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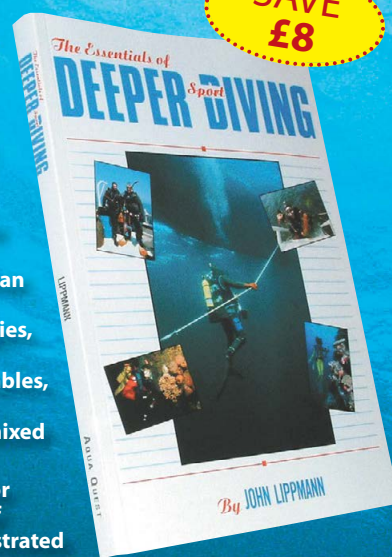
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Wreck the dive

BACK IN THE DAY THERE WAS a popular dive-club mantra that went: Plan the dive. Dive the wreck. Wreck the plan.

Anyone tasked with marshalling a club dive will recognise this strand of dark humour. However much preparation is done, however many stern warnings are issued – all designed to maximise the chances of a safe dive and orderly return to the boat – it counts for nothing once people hit the water.

The only predictable thing about diver behaviour is its unpredictability.

To “dive the wreck and wreck the plan” provides a subtle hint about the dizzying power of that experience. It suggests that encountering the wreck could be so amazing that it overwhelms our sensible, disciplined selves. We are captivated.

So perhaps the wrecking of a dive-plan isn't weakness or complacency. Perhaps it's simply the price we pay for being awe-struck. I'd love to hang on to that romantic version of events, but let's take an evidence-based approach.

Available data (experience) indicates that it's not the most easily wowed divers who dive the wreck and wreck the plan. It's the ones called Kevin or Dangerous Dave, and they'll be carrying a crowbar and a lifting bag. Less awe-struck, more lump-hammered.

WRECKING THE DIVE-PLAN is really a minor issue. Our larger concern should be wrecking the actual dive. Before we start looking to blame Kevin or Dave, dive-wrecking is mostly a self-inflicted wound.

It's entirely possible to sabotage yourself before you've even arrived. By leaving an essential part of your kit behind. Like your rebreather mouthpiece. Or your wallet.

You can mistakenly stick diesel in the fuel tank of your petrol car on the drive down and feel wordlessly shamed by your AA rescuer.

You can turn up promptly at the harbour, expecting to load your kit. Then discover that the dive-boat is launching at a neighbouring marina and you had failed to check the updated instructions.


If you arrived the previous evening, you might fall out of bed with such a blinding hangover that you have no clue which boat you're even trying to find. It's all happened.

Something as simple as mistiming your pre-dive visit to the loo – especially if you're diving in a drysuit – can cause havoc. Forgetting your hood and gloves when diving in cold water will freeze your brain and numb your hands until both are in a dangerously inert state.

Jumping in without your weight-belt is only slightly less embarrassing than jumping in with your drysuit zip left open. Given the very obvious and public consequences, you'd think we'd only manage these mishaps once in a diving lifetime. If only!

One technique for avoiding these dive-wrecking mishaps is to “visualise the dive”. It sounds Californian, and seems bizarre in a UK context. Picture a row of serious-looking tekkies standing on the deck with eyes shut. As if praying that they won't make a hash of their dive.

They're actually performing a mental run-through: imagining the process of putting on all their kit, in the right order, and performing their pre-dive checks. Apparently this works better than my “checklist on a Post-it note” approach. It certainly looks more impressive.

Until a stray wave drenches the deck. Then we all end up feeling equally damp, and looking suitably foolish. 

LOUISE TREWAVAS



LOCAL INTELLIGENCE 3

Eighteen dive professionals weigh in with descriptions of their personal favourite local dive-sites – and we apologise in advance if they make you want to leave at once...

RMS Rhone
British Virgin Islands
by Matt Anderson



IN ATTEMPTING TO OUTFRAN the San Narciso hurricane on 29 October, 1867, the *RMS Rhone* smashed against Black Rock Point on Salt Island and broke in half, following an explosion in which her hull was breached and seawater hit her superheated boilers.

The wreck has become the most renowned dive-site in the BVI, and one of the Caribbean's best wreck dives. It's located at 10-24m, so easily accessible to divers of all levels.

A two-tank dive is best to fully explore the bow and stern sections, which are about 30m apart at a 90° angle, while a night-dive is spectacular and not to be missed. The wreck and surrounding area became the BVI's first national marine park in 1980.

The 94m-long *Rhone* was one of the first iron-hulled ships, powered by both sail and steam.

As well as her two masts, she had a single compound steam-engine to drive a gigantic three-bladed bronze propeller, only the second bronze propeller ever built. Today this provides a great swim-through and photo opportunity.

The wreck is home to diverse sea life, including Fang the barracuda, octopuses, nurse sharks, turtles, moray eels, reef sharks, pufferfish and occasional rays and dolphins. There are many coral gardens, cleaning stations and nurseries.

Highlights of the bow section include the foremast and crow's nest, main deck supports, bowsprit, exposed keel, lifeboat davits, encrusted signalling cannon and the condenser, the deepest point at 23-24m.

The stern section, between 10 and 18m, includes the aft mast, boilers, deck-supports that appear as vertical columns, wrench set, embedded silver teaspoon, gearbox, drive-shaft, propeller and "lucky porthole" – give it three rubs and make a wish.

On your next trip to the BVI, you'll find us on Tortola at Hodge's Creek Marina or the Moorings or on Cooper Island (or arrange a rendezvous) and can join us on one of our custom Newton dive-boats for an epic dive on this wreck.

Matt is a Master Scuba Diver Trainer at Sail Caribbean Divers, and took the pictures. ●





Cap Norfeu Costa Brava, Spain

by Jan Boelen



CAP NORFEU, or “El Gat”, is one of the most famous dive-sites and landmarks in the marine park of Cap de Creus.

The pinnacle rises from a depth of 48m to within 12m of the surface, and its walls are covered with red coral and gorgonians.

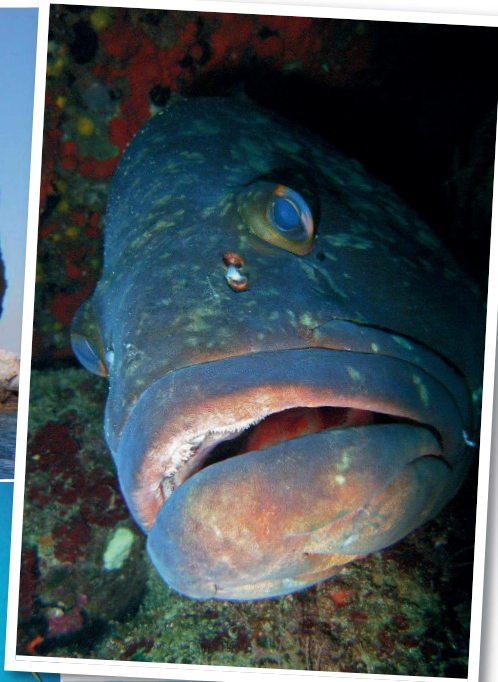
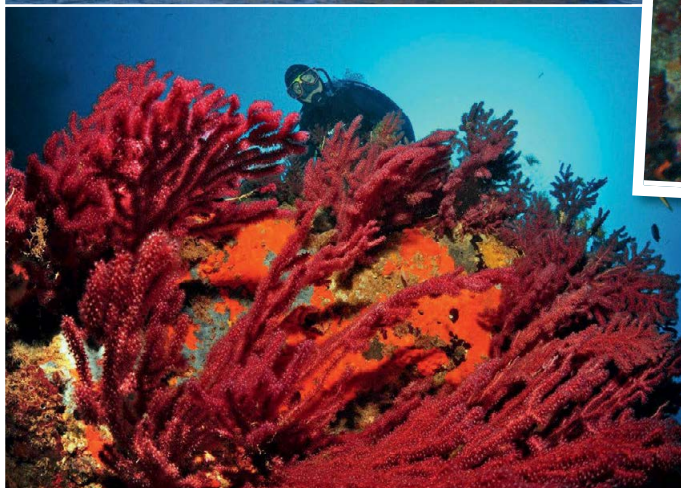
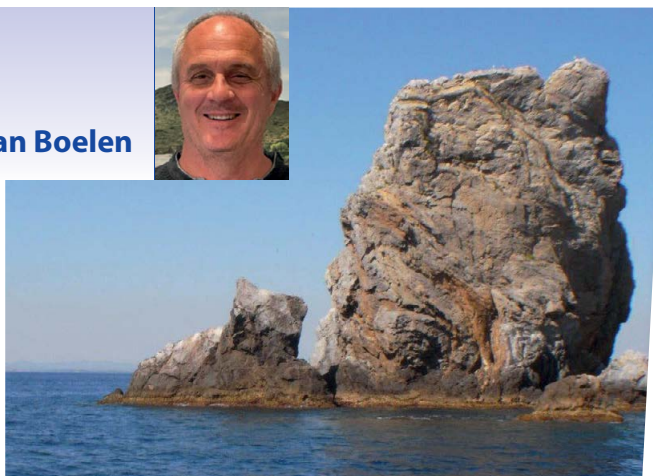
Barracuda and grouper welcome you on every dive. You can observe how each of them behaves in protecting its own territory, and divers who are patient and resist the temptation to touch them can enjoy being investigated by these inquisitive fish.

You descend on the mooring line to a shallow plateau at 12m, then fin parallel with the coast to reach the pinnacle, circling it in accordance with your personal depth limits.

Staying at 18m it takes a good 15 minutes to cover, while if descending to 30m it would take about 30 minutes to circle. By ascending gradually towards the top of the pinnacle, however, deco can easily be avoided.

During the ascent you can still observe the grouper, as well as octopuses hiding from them. Wandering around you'll see moray eels sharing their space with other creatures, rock cod and hundreds of barracuda. Occasionally we enjoy visits from sunfish, which share their cleaning stations with dentex, dorada and corvina.

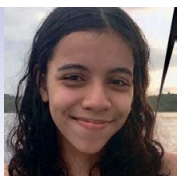
And if you have enough air you can also take in the Garage, where *Flabellina nudibranchs* and other invertebrates graze the rocky walls. It's the Mediterranean at its best.



The Mystery Plane

Coron Palawan, Philippines

by Serina Fahrenbach



PLUNGING INTO the middle of the sea, you see nothing but the abyss. The water is cold, there is no sign of life and your breathing is seemingly the only thing you hear.

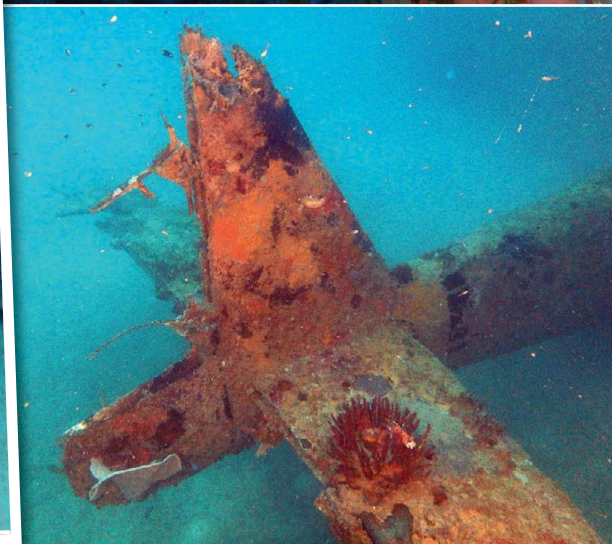
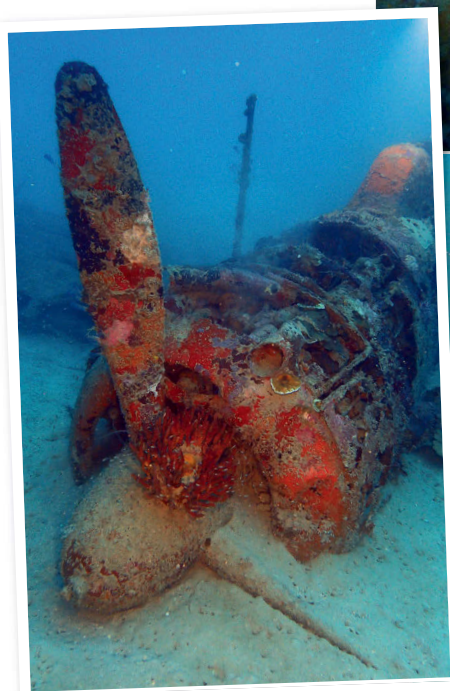
After a few minutes, you begin to wonder if perhaps your dive-guide got lost and you're in the wrong spot, heading nowhere.

Then suddenly a plane wreck emerges from a haze right before your eyes. It's a Hayabusa Nakajima or "Peregrine Falcon", a Japanese fighter that has sat at the bottom for more than 70 years.

Discovered only in 2016 by Sea Scan Survey, the Nakajima is believed to be one of several casualties of the Japanese Imperial Army during WW2 off Busuanga Island in Coron Palawan, the wreck-diving capital of the Philippines.

However, unlike other wrecks in the area, it is relatively intact and untouched, because of its late discovery and location further out to sea. It also lies about 40m deep.

It boasts a brightly coloured cockpit and an almost intact engine-room. To avoid stirring up sediment, you carefully glide



around the wreck and, as you point your torch under the wing, you see the undercarriage exposed and teeming with life.

A number of species of corals, marine invertebrates and fish dwell within and around its structure.

Only a few examples of this Nakajima model have survived. What happened to its pilot and why it sank remains a mystery waiting to be solved. The fighter wreck is almost exclusive to our dive-centre, which offers a second, shallow dive

to seagrass beds nearby where dugongs, the gentle giants of the sea, can be seen – if you're lucky!

Serina is a rescue diver at Dugong Dive Center, dugongdivecenter.com

Colombara

Portofino, Italy

by Luca Smecca

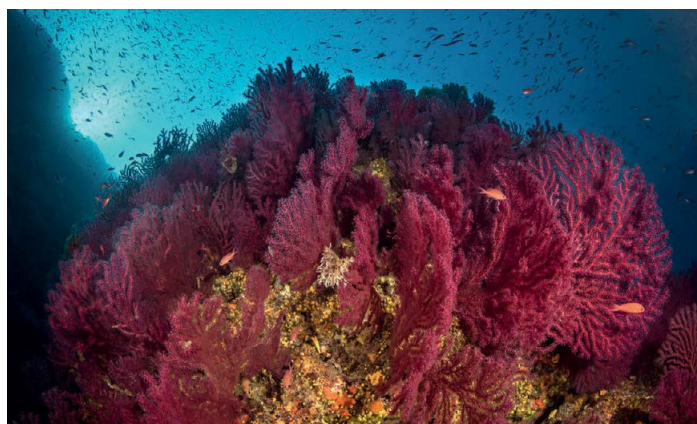


PORTOFINO MARINE PARK is located in the north of Italy, just half an hour from Genoa, and it's an area of very high biodiversity that includes 20 beautiful dive-sites.

For me, Colombara is one of the most special in the marine park.

The dive begins in a shallow bay. Once we reach the bottom we head east and at a depth of 22m join an extraordinary vertical wall that descends to 45m.

The wall is completely painted in red



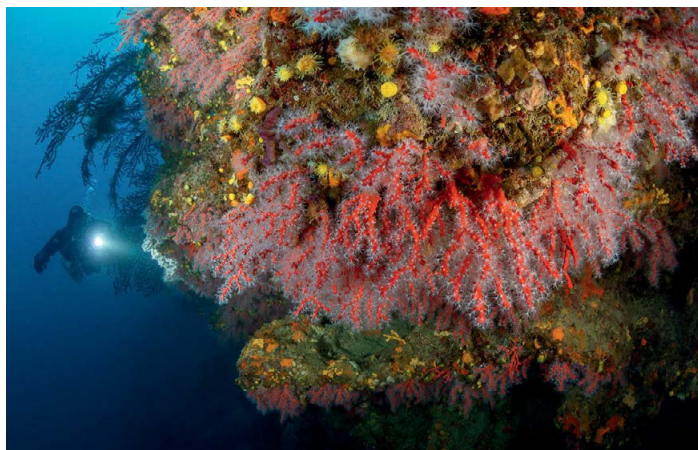
coral, an endemic species of the region. At 35m we find an arch that forms the entrance to a small cave, where there is time for a brief penetration before returning outside.

Along the wall we keep a look out into the blue, because amberjack and snapper are likely to be there hunting the thousands of small anthias that through the wall.

The red-coral covering on the wall is now accompanied by huge branches of red gorgonians which, with the blue of the deep water, creates an unbelievably colourful display.

Now it's time to start ascending to the top of the wall where, at 16m, we find an exciting swimthrough with a





white sandy bottom. Once out of there, majestic brown grouper lurk as if waiting for you.

Returning to the bay, we find at 8m a big rock concealing a small entrance to another swimthrough.

This one will guide you up to the

surface, where you will be able to admire another cave, this one complete with stalactites.

Luca is sales executive officer at Diving Group Portofino, dgportofino.com. Photos by Marcello deFrancesco. ●



groups of 25-500, and are seen from the boat leaping high in the air and splashing onto the water's surface.

And if that isn't enough ray action, southern sting rays and squadrons of eagle rays hang there too.

Rays aren't the only marine life divers encounter. Whitetip sharks, horse-eye jack, Pacific barracuda, tarpon, snapper and many other species of schooling fish reside there, but share the space with macro life such as colourful nudibranchs and dorids, translucent blue tunicates, blennies, gobies and seahorses.

These nutrient-rich waters make

it a prime breeding ground for humpback whales. Antarctic whales arrive in late July and can be seen through early November, while the northern whales coming from Alaska and California pass through from December through April.

Pods of pilot whales, false killer whales and orcas turn up too.

This diver's playground and tons of adventure activities can be accessed from beach resorts just 20 minutes from the Liberia Airport.

Bill runs Bill Beard's Costa Rica, billbeardcostarica.com ●

Catalina Islands Costa Rica

by Bill Beard



COSTA RICA ATTRACTS divers from all over the world who come to enjoy the prolific Pacific Ocean marine life, but if you're particularly keen to dive with schooling giant Pacific mantas, the world-renowned Catalina Islands are the place to go. The main island is just a 30-minute boat-ride from the Gulf of Papagayo's mainland.

It's not uncommon to see one or two giant mantas with 5-7m wingspans throughout the year but the

optimum time to see schooling mantas visiting this cleaning station is November to May.

Divers are blessed at times to see herds of cow-nosed rays in schools so large that they can take a full 5-8 minutes to pass by, filling the ocean from surface to floor.

Mobula rays appear in smaller



Masaplod Sanctuary

Dauin, Philippines

by Jonathan Anderson



A VOLCANIC BLACK SANDY beach backed by giant palm trees greets you as your traditional Philippine *banca* outrigger dive-boat pulls up to the mooring. We're diving Masaplod Norte, a site with something for both the macro-spotters and coral-lovers among the small group patiently listening to the briefing.

A shallow seagrass bed full of tiny hairy frogfish blends into a sandy slope being scoured by the sharp-eyed guide looking for tiny creatures. Soon enough, the pops of giant strobes

reveal isolated huddles of divers intent on capturing the perfect image of a pair of hunting flamboyant cuttlefish, a curious wunderpus peering out of a borrowed burrow, or a dainty harlequin shrimp feasting on starfish.

Dauin is famous for its muck-diving, but there's nothing dirty about the gently sloping reef that marks the beginning of the Sanctuary proper.

Clouds of anthias, chromis and damselfish jostle for position above *Acropora* table corals, while foraging *Flabellinas* and assorted exotic

nudibranchs root about in crevices and sponges from the shallows down to 25m.

A few more kicks bring us to an isolated coral patch layered with a swirling school of five-lined snapper,



Vanicoro sweepers and cardinalfish holding the next batch of eggs in their mouths. A sudden explosion from the sand nearby reveals a blue-spotted sting ray making a fast exit.

Back at the mooring, a scratching post in the shallows is occupied by a giant male green turtle attempting to rub off a persistent barnacle.

Back on the boat, the excited chatter

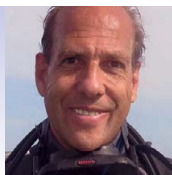
confirms that everyone seems to have got what they wanted out of the dive, and Masaplod Norte has delivered again. Talk turns to where to take the second dive, and it's no surprise to be asked: "Can we do it again?"

Jonathan is an instructor at Mike's Dauin Beach Resort, mikes-beachresort.com. He took the photos. ●

House Reef S Plateau

El Quseir, Egypt

by Bernhard Lang

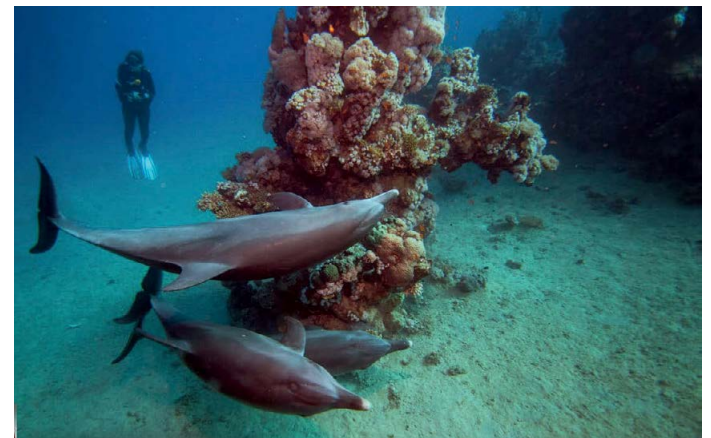


NOT FAR FROM the main entry to our house-reef bay is the small tip of the main reef. This forms a plateau, starting from 2m and sloping down to 18m.

We're then outside in the Red Sea, dipping to about 25m at the edge before dropping to 40m or so.

To reach this site we usually take a short ride in the Zodiac, and the driver gives us the signal to roll back into the water. After a brief check on the current we head straight down to the edge.

If there is only slight current, usually from the north-east, you

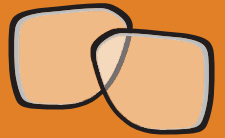


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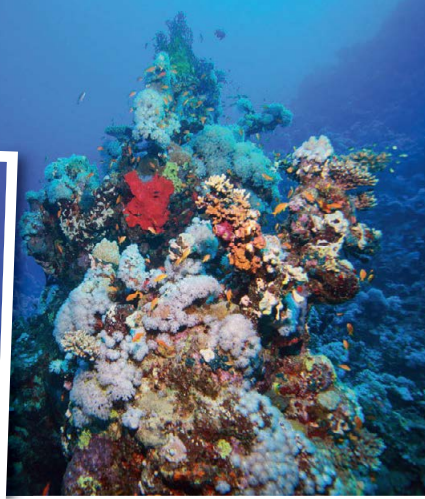
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“growing” on top of it, with a lot of lionfish hiding inside during the day, waiting for nightfall to hunt.

Moving a bit shallower, you find soft coral in which one of the most

can swim against it and enjoy the fish-life. Thousands of anthias and fusiliers move in and out, a school of tuna patrol the tip and at times you can spot a Napoleon wrasse passing at depth.

Usually there is current around the south plateau, so the corals there are in amazing shape.

Some bigger coral blocks are

sought-after Red Sea fish can be found – the longnose hawkfish.

Before we swim back to the main reef we visit a big coral block that stands alone around 15m from the main reef. Here at Erg Guddi you’ll find four kinds of cleaner shrimp, clownfish in a big anemone at the top and sometimes a big moray eel hiding inside as it enjoys the

cleaning service.

Reaching the main reef, we move up a bit towards 10m to find a wall covered with typical Red Sea hard coral. Octopuses and morays hide inside, bannerfish and batfish school around the blocks, a turtle searches for soft coral and, in the deeper area, eagle rays or dolphins sometimes pass by.

After around 35 minutes we’re back in the south area of the house-reef bay and finish in the shallow waters of our sandy lagoon, looking for double-end pipefish, flatfish, scorpionfish and crocodilefish.

Bernhard is base leader at Euro Divers Utopia Beach Club, euro-divers.com



Twin Rocks Anilao, Philippines

by Dood Santos



THIS MARINE SANCTUARY is one of the most famous dive-sites in the diving paradise known as Anilao, and it’s easily accessible from shore as well as by boat.

The two seamounts that give it its name teem with colourful coral and species of fish including clownfish, barracuda, parrotfish, trumpetfish, damsels and lionfish.

Nudibranchs, eels, octopuses, crabs, shrimps and sea turtles are also regularly sighted in this underwater haven, and macro and wide-angle photographers alike can appreciate the species variety and seascapes.

There is also a bed of giant clams just a few metres from a sunken barge covered in hard and soft coral, and more nudibranchs and sometimes frogfish are spotted there.

Mantis shrimps are often seen scurrying around in the open. Banded sea snakes can be seen hunting for their next meal – and all of this can be enjoyed within the space of an 80m swim and depths ranging from 5-18m.

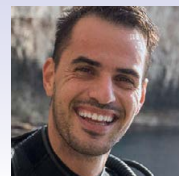
With a comfortable average water temperature of 27°C, a 3mm wetsuit is more than enough for an easy 60-minute fun dive in clear water with up to 20m visibility.

It’s always an exciting dive, too, because sometimes special critters such as blue-ringed octopuses, harlequin or tiger shrimp and rare nudibranchs turn up in the area.

Dood is a divemaster and marketing officer at Buco Anilao Beach & Dive Resort, bucoanilao.com

Rozi & Arch Cirkewaa, Malta

by
Michele
Aguis



CIRKEWWA, SITUATED along the northern coastline, offers some of Malta’s most fascinating dive-sites, with the mv *Rozi* topping my list.

Albeit overshadowed by the larger neighbouring P29 wreck, what the *Rozi* lacks in size it makes up for in beauty.

The wreck is accessible from the shore. A giant stride leads you into the clear waters and a relatively short swim leads you to the tugboat. Built back in 1958, following retirement it was scuttled in 1992, yet it still lies intact at a maximum depth of around 34m.

Its compact size gives you plenty of time to cover every angle and allows you to absorb it all.

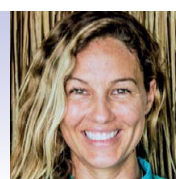
Shoals of various fish species call the wreck home and give it plenty



Magic Mountain

Misool, Raja Ampat, Indonesia

by Sabine Templeton



of life. Keep your eyes peeled for any eels, scorpionfish or rays that might be lurking in the sand.

The dive then proceeds to the picturesque Cirkewwa Arch. Once a cavern, the roof has collapsed and made way for a spectacular arch with a depth of around 18m.

It's common to see shoals of amberjack and barracuda around.

After passing through the arch, a slow ascent towards the exit point follows, with a lovely swim beside Adrian's reef. The verdant meadows of *Posidonia* provide a rich habitat

that teems with life. Finally, a swim through a short tunnel leads you towards the area named Susie's Pool for the safety stop.

Fascinating light and wonderful turquoise waters help these few minutes to fly by. Once out of the water, head to the snack bar for a traditional Maltese *ftira*, and enjoy the warm sun and fabulous views until it's time for the second dive.

Michele is photographer (he took the pictures) & ambassador for Maltaqua Dive Centre, maltaqua.com



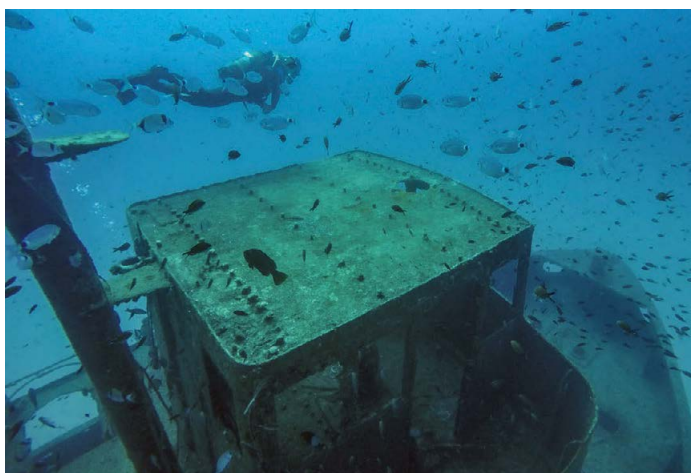
MAGIC MOUNTAIN is one of Indonesia's most talked-about dive-sites. It's located in the deep south of Raja Ampat inside the Misool Marine Reserve and takes around 20 minutes by boat from Misool Resort.

Also known as Shadow Reef, the site is a submerged ridge, and its exposed position and currents make it a magnet for marine life.

It starts in the shallows and extends out to a deeper section, dropping off to more than 40m.

Some areas are sloping; others have dramatic wall sections. The west is swathed in soft corals and gorgonians. There are at least two manta ray cleaning stations and the site is a year-round hub for mantas.

Magic Mountain is one of the only places on Earth where you





can see both giant oceanic *birostris* and the smaller reef manta, *alfredi*.

A typical dive starts with a descent along the ridge to the deeper section. This is a great place to look for grey reef and whitetip sharks patrolling in the blue.

It's also common to see manta rays gliding in from the blue to visit the deeper cleaning station.

As bottom-time decreases, divers can gradually follow the reef back up to the shallows.

Along the way, expect to encounter schools of striped snapper, batfish, bigeye trevally and several lone Napoleon wrasse.

Look for other pelagics in the blue, such as barracuda and giant trevally. If the current allows, take some time to peek beneath the huge

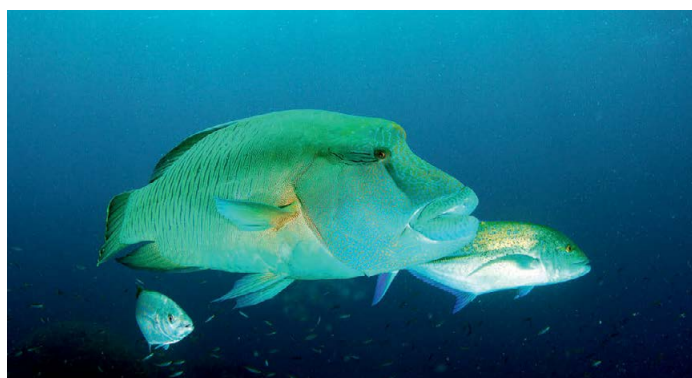
table corals to see if you can spot juvenile whitetips – you might even spot one of our resident wobbegongs (*above*)!

Manta action is not limited to deeper areas of the site.

One cleaning station is located in the shallows and, if the mantas are present, you could easily spend the whole dive watching them while gathering ID shots for the Misool Manta Project.

Magic Mountain represents a rare combination of “sure thing” and “wild card” – you never really know what might turn up, but you can be sure that it will be Magic!

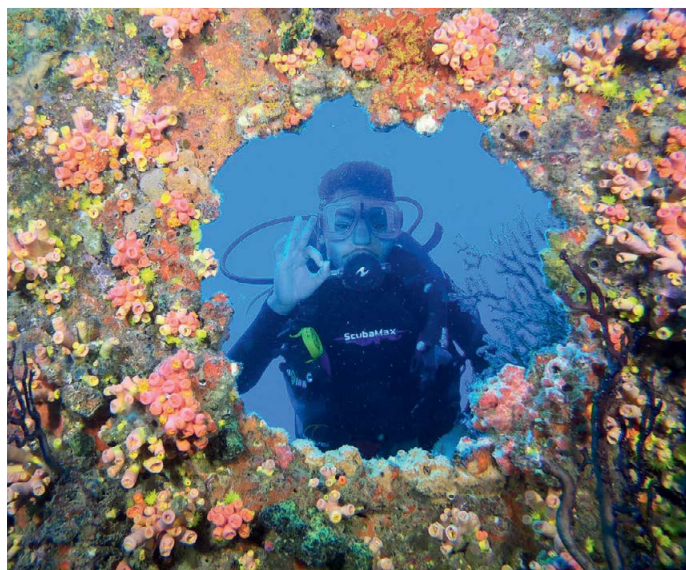
Sabine is Misool Eco Resort's dive & recreation manager. misoleco resort.com. She took the pictures. ●



The Maverick

Mount Irvine Point, Tobago

by Derek Chung



DELIBERATELY SUNK to create an artificial reef and diver playground off Mount Irvine point, the *Maverick* is Tobago's most popular wreck-dive and an ideal site for those seeking their PADI Advanced Open Water, Deep Diver or Wreck Diver certifications.

Built by Ferguson Shipbuilders in 1960, the ship is 60m long and was launched in Scotland's River Clyde as the *Scarlet Ibis*.

Together with her identical twin-sister *Bird of Paradise*, they were Trinidad and Tobago's first roll-on roll-off (ro-ro) ferries, providing the vital sea link between the islands well into the 1970s.

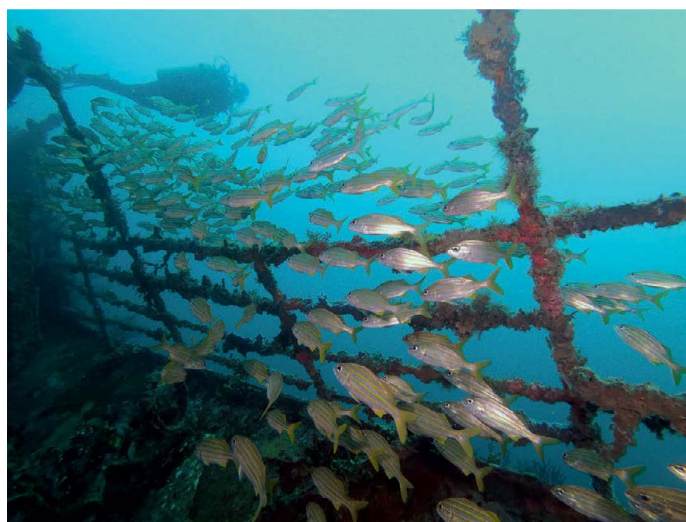
Sunk upright in 30m of water in 1997, the ensuing years have worked Nature's magic and the *Maverick* is almost completely

covered in encrusting sponges and hard and soft corals.

Enveloped by schools of brown chromis, creole wrasse, silver baitfish, amberjack and bonito, a typical visit starts with a descent along the mooring-line to the forward deck, with a sweep around the bow for that classic image of the ship's bow looming above you, perhaps pausing for a photo op framed by colourful sponges.

Dropping back along the port side allows you to peer into the car deck before descending further to inspect the rudders, where you might find sting rays and migratory cobias.

Crossing the stern loading-ramp leads you midships over collapsed decking and hull sections, the stairwell, porcelain toilet bowl,





schooling striped grunts, mangrove snapper, French and queen angelfish.

Spiralling upwards brings you over the remnants of the bridge, where you'll often find the wreck's resident humongous green moray eel, before you reach the ship's funnels, which mark the shallowest point of the wreck.

Consultation of gauges usually indicates the start of your ascent at this stage, which is accomplished along the mooring-line with the requisite safety stop along the way, so ending another exciting Tobago dive!

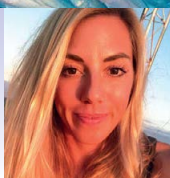
I thoroughly recommend getting wet on the *Maverick*.

Derek is the owner of Undersea Tobago, underseatobago.com



Blue Corner Palau

by Melanie Oborski



PALAU IS LIKE A good box of chocolates, but in diving – many options, but you can hardly go wrong with any choice, so picking a favourite is challenging.

Blue Corner is easily the most famous dive-site, and a spectacle that must be seen. Starting on either side of the “corner”, the dive starts as a stunning drift along the beautiful steep wall, overgrown in coral and busy with marine life.

From critters such as leafy scorpionfish to larger fish such as barracuda and bumphead parrotfish, the variety of species found on this wall-dive is countless.

Drifting with the current, it doesn't take long until the dive



reaches the corner, the edge of a flat plateau, running a couple of hundred metres out to sea. Currents can be strong in this exposed spot and the experienced guides from Sam's Tours Palau help divers get “hooked” safely, right on the edge to enjoy the best views of the action.

The conservationist's heart beats faster when seeing the numbers of grey reef, whitetip and other species of sharks patrolling in front of the divers. Trevallies, barracuda and a variety of tropical fish join the fun to make this dive an all-time favourite.

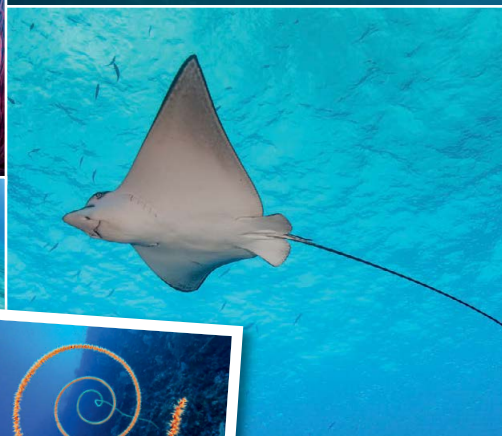
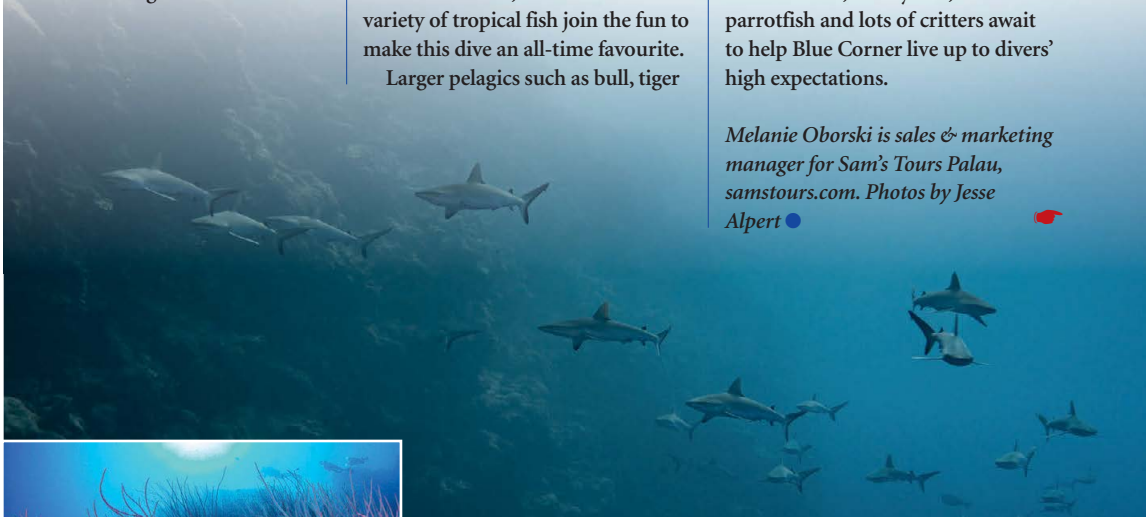
Larger pelagics such as bull, tiger

and hammerhead sharks can be spotted in the deeper reaches of the wall at times, making Blue Corner an interesting technical-dive option.

The most famous crowd-pleaser for recreational divers is found on almost every dive: the resident and extremely curious Napoleon wrasse that demands attention and is everything but subtle about it.

The ideal finish to this amazing dive is the shallow plateau area where turtles, moray eels, more parrotfish and lots of critters await to help Blue Corner live up to divers' high expectations.

Melanie Oborski is sales & marketing manager for Sam's Tours Palau, samstours.com. Photos by Jesse Alpert



Helengeli House Reef

North Male Atoll, Maldives

by Luigi Scardigno



FAMOUS FOR THEIR turquoise, clear waters, the Maldives are a paradise for scuba. They have good coral reefs but it's the abundance of marine life that sets them apart, and no more so than at this dive-site in North Male Atoll.

This house-reef allows divers to discover its rich biodiversity, from tiny nudibranchs and colourful tropical fish to large reef sharks, rays and turtles. It hosts multiple species that will satisfy everyone's passions and expectations.

The dive starts just beneath the water's surface and already at a few

metres deep you'll be introduced to a wide range of colours while diving among powder-blue surgeonfish, pennant coralfish, parrotfish, big schools of bluestripe snapper and many other species.

When you reach 10m, look out into the blue and you'll find curious batfish swimming all around you.

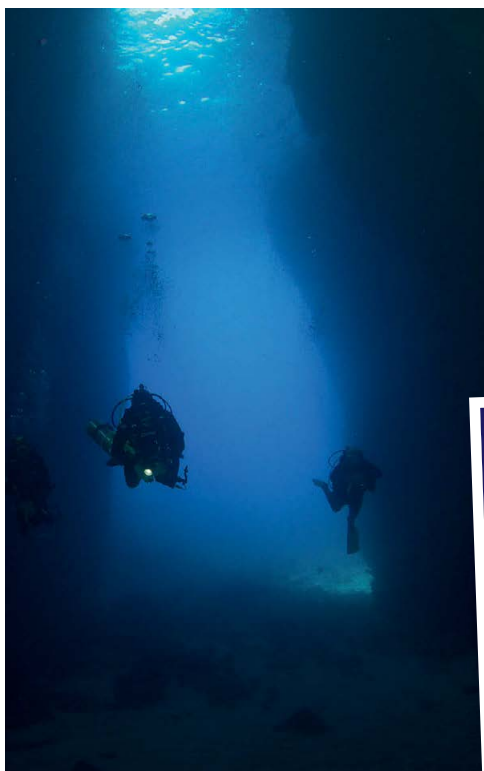
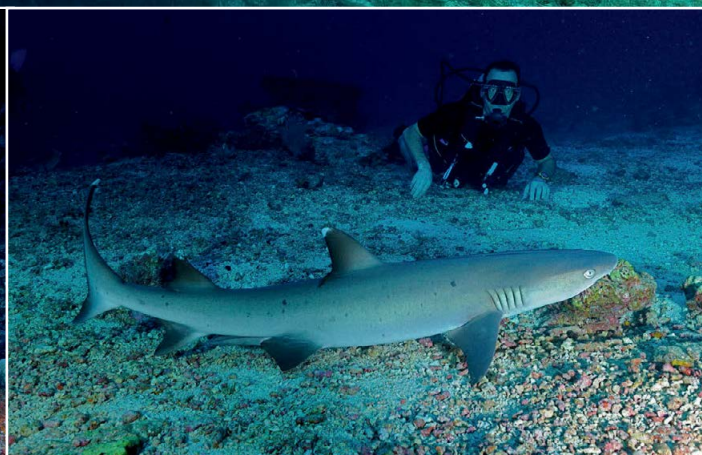
At that depth, sting rays and eagle rays can be spotted as well as reef sharks and turtles, all in search of food and/or resting on the edge of the reef.

Pay attention to the cracks and caves on the reef, because they

provide shelter for many lobsters and, sometimes, sleeping nurse sharks.

To spot some of the species more active after dark, such as the nurse sharks and morays, night dives are organised around the reef and offer a great experience.

Luigi is TGI dive-school manager at OBLU by Atmosphere at Helengeli, atmospherehotelsandresorts.com



THE CAVE IS

located in a submerged reef 200m south of the Ortholosis sea stack, in the Petriti area.

This dive is possible only in calm seas, and the boat is anchored in about 6m of water on top of the small reef

We slip south, down a vertical wall, dropping all the time, past some big cracks. Entry is about 30m but the floor drops way deeper.

As we enter the cave, the scale is impressive.

Devil's Cave

Paxos, Ionian islands, Greece

by Angelos Moumoris



The blackness is split only by our lights. The bare walls drop vertically out of sight and the 5-8m-wide roof is at about 24m.

We stick to the left and, as we move further in, we round a bend losing sight of the mouth, then it seems even darker.

After 45m there is a sharp bend to the left into a kind of chamber. Keeping the wall on our left, we work our way out again.

On the walls are starfish, the odd shrimp and occasionally a rock lobster. Many other caves in the area have brightly coloured walls when lit, but "The Devil" is dark.

It's really nice to see the entrance again but our exit is up the chimney, a vertical tunnel in the roof about 1m in diameter, starting at 25m and opening out at 17m.

This is a different world, bright and warm (above the thermocline). There is a lot of vegetation and small fish. We gently meander





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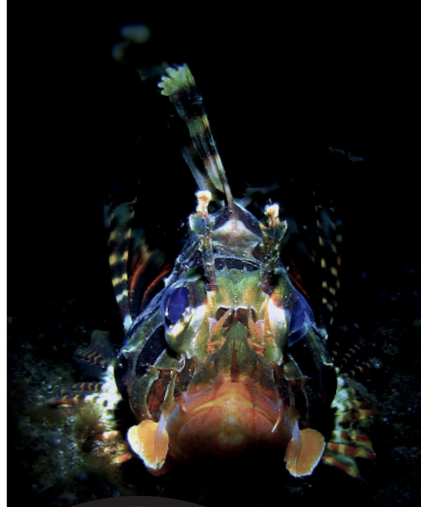
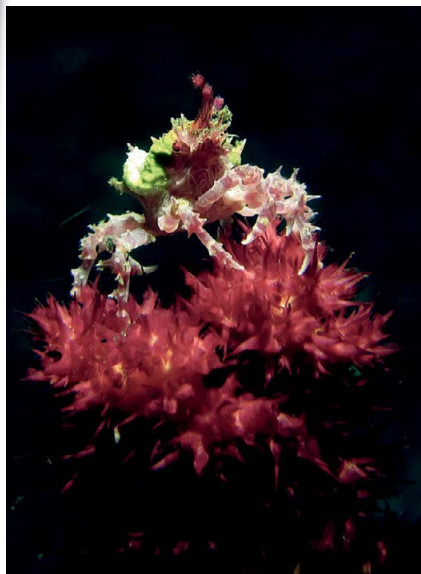
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up the reef, around rocks and up through a nice arch where you can see scorpionfish and nudibranchs, turning stones to look for octopuses.

Past a few shallow caves, interesting rock formations can be found at 5m. They look volcanic but this is unlikely in limestone so we guess they are petrified trees. Perhaps this is where the name Petriti comes from.

Back to the anchor and onto the boat for our surface interval, to change tanks and head for our second adventure of the morning...

Angelos is an instructor at Paxos Oasi Sub, paxosoasisub.com



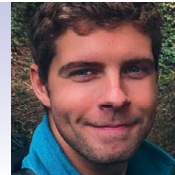
SOLITUDE LEMBEH RESORT'S private jetty juts out into one of the sheltered bays of the Lembeh Strait and the midst of the dive-site known as Jahir, making it our virtual house-reef. One of the most convenient aspects is its suitability for all divers from bubble-makers to advanced open-water divers – there is plenty to discover at any depth!

Jahir offers a variety of fascinating marine life. Divers are greeted by the sight of numerous vibrant coral bommies teeming with reef fish. One of the highlights is our "Seahorse Hotel", established under

Jahir

Lembeh, N Sulawesi, Indonesia

by Henry Collister

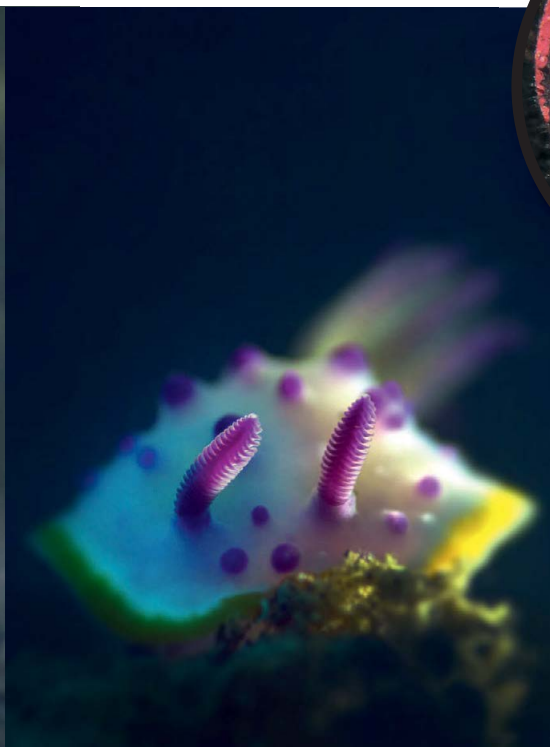
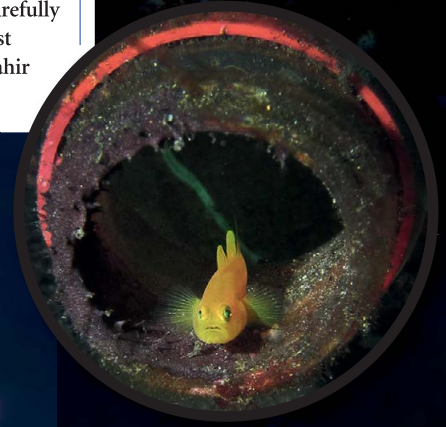


the guidance of expert Dave Harasti, where we frequently spot common and thorny seahorses as well as the occasional frogfish lurking.

After indulging in this initial shallow part of the dive, we continue deeper, following the black-sand slope. Divers can then head right, for remnants of wreckage offering

excellent opportunities to find various species of nudibranch and eel, or take a favoured route to the left and the iconic muck-diving more associated with Lembeh.

Here we progress slowly, carefully scanning the sand for the most highly sought-after critters. Jahir is a dive you can do time and



time again and yet it feels different on each occasion – from one dive to the next, the critters you see can be completely different.

Look out for mimic, coconut, mototi, long arm and hairy octopuses as well as diver favourites such as flamboyant cuttlefish, ghost pipefish and hairy frogfish.

This is my favourite Lembeh dive-spot, and one I would dive daily simply for the plethora of rare creatures that could be lurking.

Every dive here feels like a new treasure hunt!

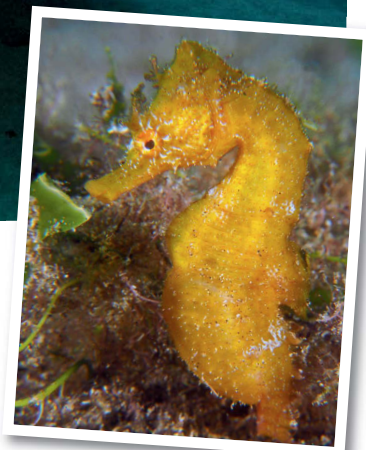
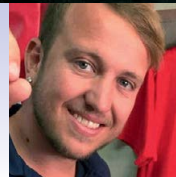
Henry is marketing & creative manager of Solitude Liveaboards & Resorts. Photos by Virson Mait ●



Playa Grande

Lanzarote, Canary Islands

by Dennis Rabeling



I F THEY ASKED ME to dive every day at Playa Grande, I would say yes!

Every day is a different day there, with varying life. We even find new species – every other week.

We can reach Playa Grande from our dive-centre by walking with the kit through the water – it's super-relaxing, so we can take our time.

We go down from the beach onto a sandy plateau where we can get up close with many small lifeforms, but also big ones such as the typical angel shark (*Squatina*

squatina) and many species of ray: eagle, sting, butterfly and torpedo.

When we reach a depth of around 20m we find a drop-off that just keeps on dropping – to about 1500m! Here we find reef fingers with spectacular swim-throughs.

On the reef we're bombarded with the colours of sponges, little corals and much more. Many critter species can be found, including moray eels, crustaceans and my favourite nudibranchs!

When we reach our deco limit or are getting low on air, we have a

small house-reef at shallow depths between 5 and 10m where we can fin around until we finish our air.

This reef too is full of life, and often we're able to find a seahorse in the shallow rocks, as well as octopuses, cuttlefish and many

other creatures.

If you'd like to come diving with us here at Playa Grande, I can assure you that I'm up for plenty more dives there. I hope to see you soon!

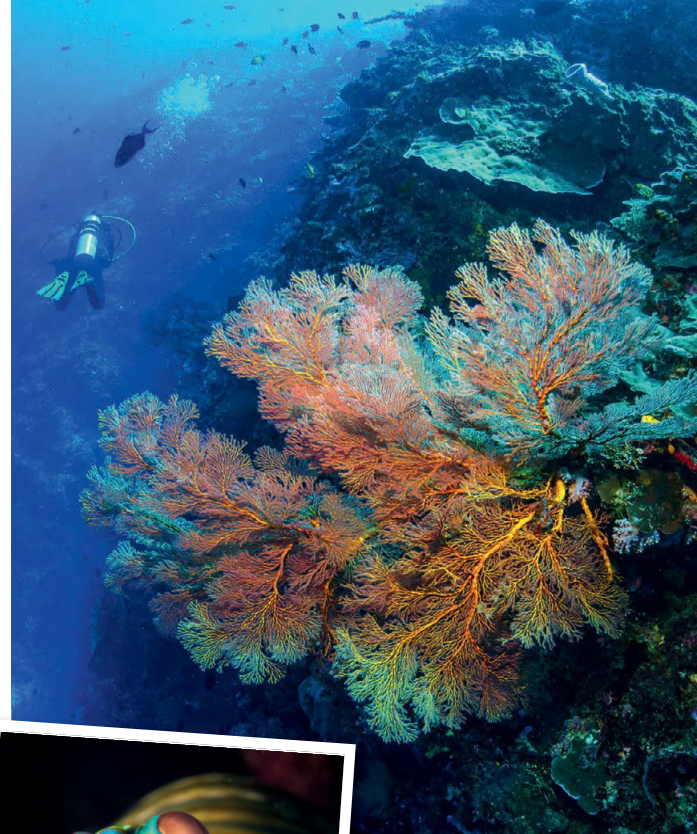
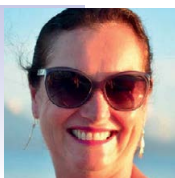
Dennis is owner and an instructor at Euro-Divers Lanzarote, euro-divers.com. He took the photos. ●



Mandolin

Bunaken, N Sulawesi, Indonesia

by Elaine Wallace



WHEN ASKED to write about my favourite dive-site around Bunaken, I thought it would be easy. Then I changed my mind at least five times a day for a week, because we're so spoilt for choice – we have drift dives and walls, sloping reefs and muck-diving rich in critters.

In the end I chose Mandolin. Why? Because this is a site (wall and drift) abundant in dazzling coral and possibly the most impressive variety of marine life I have ever experienced.

Pelagics cruise the drop-off, eagle rays glide serenely along the reef, a large school of black snapper lurks menacingly, coral overhangs provide shelter for whitetip sharks, and the only constraint to seemingly limitless visibility are the dense schools of butterflyfish and red-toothed triggerfish.

And then there are the turtles; unruffled by divers, they rest on ledges or contentedly munch coral – a photographer's dream! – while for macro-lovers, the soft corals are



home to a bewildering variety of crabs, shrimps and nudibranchs.

The reef-top is spectacular, and I often spend half the dive cruising through one of the loveliest coral gardens I have ever seen with my camera at the ready, because the fish and critter life here is simply stunning.

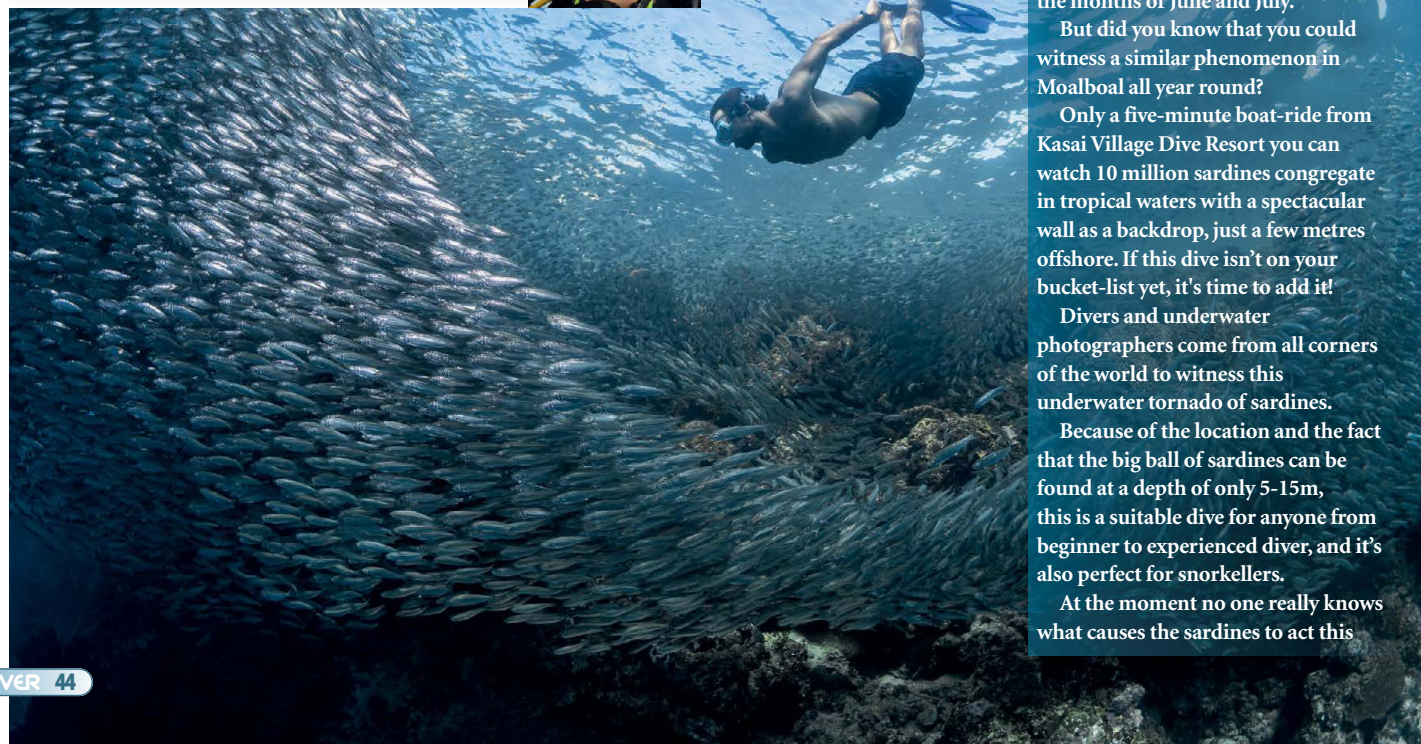
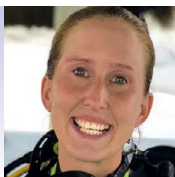
I could dive Mandolin every day, and every day have a different experience. Indeed, it has given me some of the most incredible dives of my life. Mandolin is special.

Elaine is co-owner of Bunaken Oasis Dive Resort, bunakenoasis.com

Sardine Run

Moalboal, Cebu, Philippines

by Caroline Sandstedt



I'M SURE YOU'VE all heard about the magnificent Sardine Run in South Africa, where you can watch a massive, migrating baitball between the months of June and July.

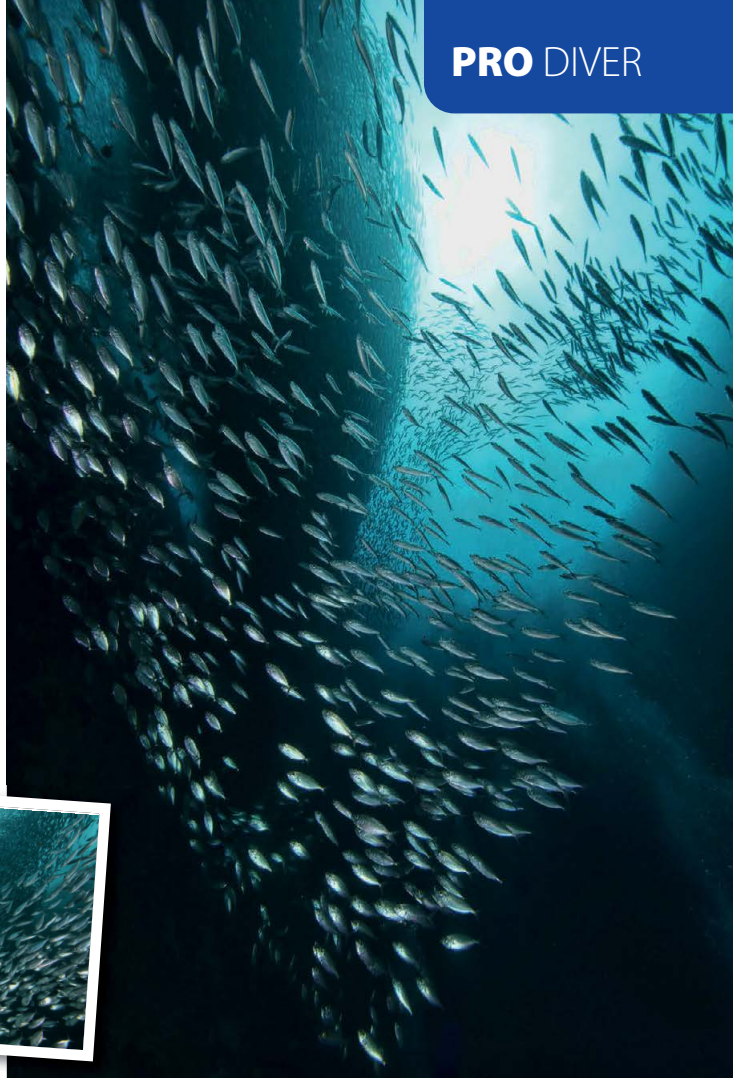
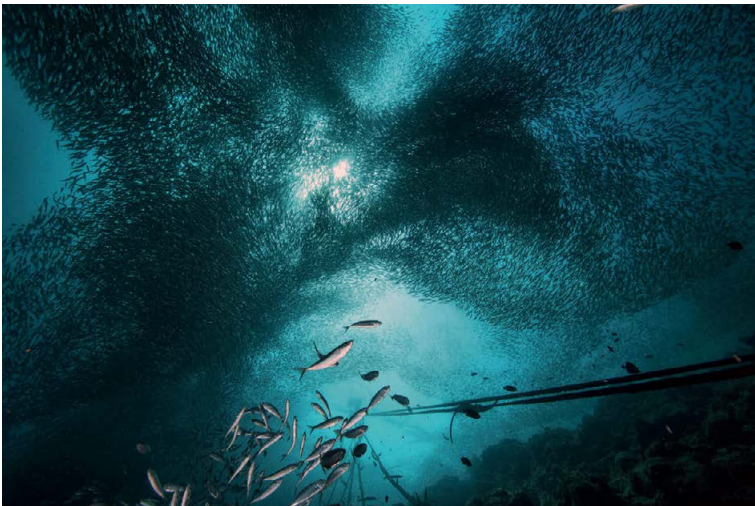
But did you know that you could witness a similar phenomenon in Moalboal all year round?

Only a five-minute boat-ride from Kasai Village Dive Resort you can watch 10 million sardines congregate in tropical waters with a spectacular wall as a backdrop, just a few metres offshore. If this dive isn't on your bucket-list yet, it's time to add it!

Divers and underwater photographers come from all corners of the world to witness this underwater tornado of sardines.

Because of the location and the fact that the big ball of sardines can be found at a depth of only 5-15m, this is a suitable dive for anyone from beginner to experienced diver, and it's also perfect for snorkellers.

At the moment no one really knows what causes the sardines to act this



way – the phenomenon is poorly understood from an ecological point of view.

But importantly the sardines attract a lot of tourists and the locals understand the positive effect of this, so no net-fishing is allowed in Moalboal.

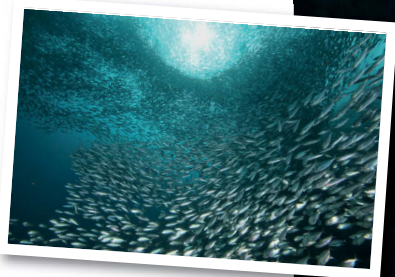
The traffic is heavy down here, but it's the sort of traffic you wouldn't mind and is perfectly organised.

The sardines are all effortlessly coordinated, creating alien formations and moving together to perfection.

The sight will keep you hypnotised

for the better part of your tank. It's the top attraction for the resort's divers, and it's easy to understand why.

Caroline is an instructor at Kasai Village Dive Resort, kasaivillage.com



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BLACK CORAL

RE-CREATING DANGER



Re-creating danger can be almost as risky as the real thing, and that means more than just cut fingers, says filmmaker **BRETT WINN**, producer of a documentary film that gets under the skin of black-coral divers



WHEN WE SET OUT to make the film *Black Coral*, neither I nor my brother, the director, were dive-certified. We had been pitched on the idea of going out to Maui and filming an elite group of divers whose stories involved the beauty of the deep ocean, diving to insane depths, and the curious addiction they felt for coral-diving.

We wanted the film to be about the divers and, unlike most documentaries, to be entirely in their own words.

We knew it would be far less impactful simply to show talking heads for the entire runtime, so we decided to re-create as many of their stories as best we could.

We had no idea what was coming our way. It turns out that trying to safely recreate inherently unsafe situations in

an environment in which fundamental things like breathing are not guaranteed sometimes creates difficulties and dangers all on its own.

Invariably people ask about certain shots, such as one in which a tiger shark swims right up to the diver, wondering how we managed to get it.

In actuality these scenes are among the least technical, least complicated in the film. Most of them are composites of two or more shots blended together.

The real challenges of recreating dramatic and often dangerous moments under water are often the things least likely to be noticed by a casual viewer.

What follows here are some highlights from our experiences making the re-creation scenes for *Black Coral*.

The other question that comes up consistently concerns the conservation and sustainability of the black-coral fishery. The film does address these issues, but it is brief and neither comprehensive nor conclusive. We presented the facts from experts in their field to allow viewers to make up their own minds about the relative merits and morality of black-coral harvesting.

The purpose of the film is to present the stories of the divers, rather than praise or condemn the industry or its practices.

'Nothing like normal filming'

It's one thing to drop down into the ocean's blue alien world and have some fun filming its denizens. It's quite another to take a crew of divers down and try to recreate specific events and situations.

Unlike filming on good old terra firma, you can't just call out directions to actors under water – or, if you do, they will have no idea what you're saying.

Swimming over to them to show them a small slate in the middle of a wide shot (when the camera and actor are furthest away) is a little like crawling over to them on your hands and knees to show them a short, hastily written Post-it note in a normal shoot.

We chose re-creation shoot depths of 20-27m because we wanted the sequences to look as true to life as we reasonably could. But at that depth you can't just rocket up to the surface every time you need to give instructions. That's a great way to waste air and, worse yet, get everyone, cast and crew, wickedly bent.

Decompression illness and its long-term consequences were something we wanted to get the black-coral divers' opinions on, not first-hand experience for ourselves.

Above: Black coral.

Below: Black-coral divers in their heyday.





Add to these complications limited vital resources, such as air, and an uncommonly short amount of time to film because of the limitations of safe diving, and you have crazy-difficult circumstances for filming.

It limits your time so dramatically that under water every time is crunch time.

The only thing you can do is have the most organised, comprehensive pre-shoot meeting possible, then hop over the side and pray that things go less badly than they could. And those are just the general filming problems. The specific ones are far more interesting.

'The most technical'

There are a few shots in the film that are filmed using mixed-gas rebreathers and

Jetboots to soar along the twilight terrain of actual 60m-deep coral-harvesting locations. That is quite technical, but it isn't strictly speaking a re-creation.

The most technical re-creation scene was one in which a diver was being dragged to the surface by a lift-bag.

We wanted to recreate the chaos and disorientation of being pulled through the water at speed.

The crew created a special rig and tow-line attached to a crane, so that the diver and cameraman would be dragged alongside the boat while mitigating turbulence from the propeller in the shot – and ensuring that they wouldn't get chopped up into chum by the blades.

In the story, the black-coral diver ascends so fast that his knees come out of the water. To accurately recreate that

moment we brought in a competition swimmer wearing a giant monofin who was able to perform the breach.

In the end it took dozens of shots and three different diver/actors to portray one coral diver in one brief re-creation.

'The most frightening'

Black-coral divers use lift-bags to bring the harvested coral up from the bottom to the surface. We were shooting re-creation footage using these bags and one of the crew got caught in the line attached to it.

Tied to a 90kg lift-bag and with nothing to grab onto, like it or not, he was going for a ride. He was dragged from 27m to the surface in a few seconds.

As a trained dive instructor he knew exactly what to do, and opened his

Above, clockwise from left: A still from *Black Coral*, the film-crew on the boat; shooting footage of a diver being dragged alongside it.

Below left: Diver on an uncontrolled ascent.

'TIED TO A 90KG LIFT-BAG AND WITH NOTHING TO GRAB ONTO, LIKE IT OR NOT, HE WAS GOING FOR A RIDE'

Right: Ornaments made from black coral – the filmmakers didn't set out to make judgements on the ethics of the trade.

Below right: Hawaii's black-coral divers.

mouth and exhaled – screamed – all the way up. Once he reached the surface, he disentangled himself and immediately came back down.

The B-cameraman on the shoot happened to be filming and caught the entire event. It should be noted that being pulled to the surface with a lift-bag was one of the stories we had been planning to re-create, because of the inherent danger for the diver.

As a result of that accident, we obtained the most realistic and most frightening re-creation in the film.

I later asked the diver how much we would have to pay him to do another intentional take of that unintentional shot – you know, just to make sure we got it right, just to be on the safe side.

He said that no amount of money would have been sufficient.

I suppose he likes having fully functioning lungs far too much to gamble with them on a stunt like that.

'The most gone wrong'

We were at a place called Cathedral just off the coast of Lanai, completing several scenes. That was the day on which, because of a choppy sea and large amounts of diesel fumes, I threw up 19 times while waiting on the boat.

Anyone who has experienced that sort of thing knows that after the third or fourth time vomiting becomes pointless and even more painful because there is nothing left to throw up. Getting into the water was a profound relief.

Most of the shots had been completed and, true to the efficient nature of filmmakers, we were trying to squeeze in a few more before packing it in for the day.

One scene we filmed depicted a diver accidentally cutting his leg wide open under water. Wherever possible we used the appropriate vintage equipment,



meaning without current gauges, computers or BCs, and in this case this meant that the actor thought he had more air than he actually did.

While being filmed he took a short, difficult breath, tried to breathe again and found that there was nothing left in the tank. He broke character, panicked and frantically swam for the cameraman's secondary regulator. (A real professional would have finished the scene, right?)

His vintage tank had a J-valve, which the dive safety officer pulled to release more air into the tank and allow them to finish the scene.

But squeezing out one more scene just wasn't enough. This crew had to get more. Resources waning and tanks draining, we set out to get the last few shots. Several involved filming inside the Cathedral – an underwater cave with black coral hanging from the ceiling like a chandelier.

During this shoot two more people ran out of air, the camera was accidentally sucked through a crack in the rocks and miraculously saved from damage by a diver on the other side, and one of the props was claimed by the sea, never to be seen again. It was an eventful shoot.

'The most dramatic'

Running out of air was not always unintentional. There was a particular

scene requiring a diver to be passed out on the bottom and another diver to swim down, grab him, and swim back up.

We thought that this would be amazing if we could get it in one wide-angle shot.

For that to work, the camera couldn't start rolling until the diver on the bottom had taken a breath and let the bubbles float out of frame.

Then, on a signal, the second diver could swim down into frame.

People do not move fast under water. Neither do bubbles. It took an amazing amount of breath control for the diver to hold his breath that long at depth.

It also took an incredible amount of strength for one diver to swim another diver up without the assistance of a BC, which the black-coral divers did not use.

To top it all off, this scene was shot at 30m to accommodate the wide angle of the camera. It was the deepest re-creation shot of the movie.

The challenges of working and filming under water are immense. Producing the very best re-creation scenes we could made shooting *Black Coral* very difficult, but it also made it meaningful.

From the moment my brother and I heard the idea pitched, we knew that if it was done right the divers' stories would make a riveting, intense documentary unlike any other. And stories like that are worth telling. ▣



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With her high profile, Miranda Krestovnikoff was named a PADI AmbassaDiver 2021 – while nobody in the UK was diving because they were locked down. Tough challenge? One attraction is that it offers an excuse for ‘stress-free’ returns to favourite UK dive-sites, she tells **STEVE WEINMAN** – and also to get the family involved. Portrait by **ADAM FRADGLELY**

DIVING

HAVE TO ADMIT THAT I'm not a regular viewer of BBC's *The One Show*, and I'm quite surprised to hear that it's now been running for almost 15 years. Which is why I hadn't realised that since the show started one of its regular reporters, Miranda Krestovnikoff, has filmed nearly 350 wildlife stories, many involving diving at sites all over the UK.

Add this to all the segments she filmed for the BBC's *Coast*, which ran for 10 series and remains on repeat, and before that the two series of *Wreck Detectives*, plus many sundry projects, and by stealth she has become one of the UK divers with the broadest range of experiences. And she has never flagged in her enthusiastic advocacy of diving in home waters.

So it makes perfect sense that PADI should name Miranda as one of its 2021 international line-up of "AmbassaDivers".

As we know, scuba-divers tend not to loom large on the public's radar, so as it goes she is very hi-vis. But what exactly does an AmbassaDiver do?

"Wave the PADI flag wherever I go, I should think!" she says merrily as we chat over Zoom. "I want to tell everybody about how amazing the ocean is, and to increase awareness of the ocean environment and the threats it faces.

"But what I'd particularly like to do through having this role is inspire younger people to take up diving.

"There's a real problem nowadays, especially in the UK, in that they're just

more recently lockdown, Miranda clearly craves more "recreational" diving.

"Everything I do is with a full-face mask and a film-crew, and though there might be a bit of that, it'll be on my terms."

She laughs, perhaps wondering just how easy it will be for a diver conditioned to being under close scrutiny to slip into full recreational mode while any camera is running.

GIVEN THAT HER mission is to get more young people into diving, she also feels that Amelie and Oliver have a part to play in her new role.

"I'm going to get Oliver qualified this year," she says. "Last year everything just fell apart, so he's doing it online. I don't know if he'll do his open water in the UK or abroad – maybe we can split it a little depending on how things go.

"But later in the year he'll get his ticket, and that'll be all the family signed up."

Amelie qualified in Gozo three years ago as her brother enjoyed a Bubblemaker experience. "We couldn't stop him. You're only supposed to go to 2m, and every time the instructor let go of him he'd just sink to the bottom. She'd drag him back up and he'd go: oh, that's really boring. He's a natural, and really good at freediving as well."

Once qualified, the idea is that the young Krestovnikoffs join their mother under water. "I don't want it to be 'look at my kids, aren't they amazing?'

she was propelled into primetime as one of the presenters of the Channel 4 series *Wreck Detectives* in 2003.

I remember members of the UK wreck-diving community, satisfied that they already knew the answers to the "mysteries" being solved weekly onscreen for a mainstream audience, being quite sniffy about this appointment at the time.

"Every now and then I get a random email from somebody saying: do you remember when you were diving this wreck? It feels like a million years ago but I do look back on it very fondly," she says.

"That was my foray into the world of marine archaeology and I was so incredibly lucky to get that job. If I hadn't, maybe my career would have been completely different.

"We'd have a whole week to go to a dive-site and film, and we might have four days under water, two dives a day.

"We had a big crew of 14, big boats, access to some protected wrecks and some cutting-edge research – it was awesome. I don't know how they had the budget.

"I compare it with what we do now for *The One Show*. I get up at 5am and head down to the South Coast, squeeze in a couple of dives and some interviews and then at 10 put my wet gear in the back of the car and come home again.

"I'd love the opportunity to work again on something with a really big budget!

"*Wreck Detectives* started a whole generation of wreck-diving shows as well. There wasn't really anything else like that on telly, and since then loads of people have done the same sort of thing.

"*Coast* again was an amazing opportunity. Nobody had done anything like that before, and again with the budgets and fantastic access opportunities. I was unbelievably lucky."

DIPLOMACY

not taking up diving as a career. I see my two kids [Amelie is 15, Oliver just turned 12] and how much excitement and enjoyment they get out of diving.

"We need the next generation to be following in our footsteps, taking up this sport and falling in love with the oceans."

And what Miranda is looking forward to is the opportunity to revisit favourite UK dive-sites but with a new approach.

"I'm hoping to generate some content for the YouTube channel, doing some of the dives that I filmed before for *The One Show* and *Coast* but in my own way.

"That means without the stress of having a BBC crew behind me; just going off with some mates, having a great day out and coming back with a film as well.

"We'll try a few out to see if PADI likes them, and then I hope to ramp it up as the year goes on."

Between the pressures of work and

but I feel they can play a part in inspiring other kids their ages to take up diving.

"I just want to tell people how accessible diving is, and how easy with a bit of training. The marine environment is in big trouble, so anything we can do to connect people with that environment a little more is good news."

MIRANDA STUDIED ZOOLOGY at Bristol University, where she learnt to dive through a familiar route in the 1990s with the British Sub-Aqua Club.

Following an internship assisting a wildlife cameraman on a *Natural World* project for the BBC Natural History Unit, Miranda became a runner and then a researcher.

The NHU, like PADI, is based in Bristol, and she still lives near the city.

She had made only a couple of appearances in front of the camera when

IN THE EARLY DAYS of *The One Show*, Miranda would be filming 50 stories a year. "Yes, we've been everywhere and filmed everything – the best job ever, though I know it sounds cheesy to say it.

"But it's all about being out and about with wildlife, preferably under water.

"Occasionally you get some unique access but usually it's just what anyone could see by themselves. I think that's the beauty of it – people watch and think: I can go off and do that too."

Which of course has struck a special chord under coronavirus pandemic restrictions. "I really hope that people have fallen in love with wildlife and their local patch a little bit more.

"From what I see and hear people have become more connected with nature.

"I hope that carries on, and that when the world's opened up they don't only think: let's get on a plane and dive abroad.

"I want to be in that queue too, but 🐠"

let's also celebrate the diversity of wildlife, wreck-sites and different habitats we have here in the UK."

MIRANDA IS HAPPIEST when she's outdoors. Through lockdown she has had the solace of birdwatching with the children in woodland behind the family home, and has appreciated having the time to do that.

She also happens to be the president of the RSPB, and bird-watching has been a big beneficiary of lockdown.

"We've done things like *Big Garden Birdwatch*, and at the end of January 2020 500,000 people took part," she explains. "This year we had 800,000, a massive increase in people engaging with nature.

"Figures like that make me feel really happy. There's not much we can say that's positive about Covid but some things have changed for the better. We've got to hold onto all these little nuggets."

Other outdoor activities she enjoys include sailing, wild swimming, horse-riding, camping and cycling, but diving has that special place in her heart, and there are always fresh UK sights to see.

"I might think I've done it all but it's one of the joys that there are still places to visit – lots of boxes I still have to tick."

However, high on her list once free of Covid restrictions this year are two familiar locations.

"We're hoping to see the Lundy seals in August, which I love to do, and also to go out to the Smalls in Pembrokeshire with Dave Kennard, who leads the group called Neptune's Army of Rubbish Cleaners [NARC]. I'm hoping to do a piece on them for PADI as well.

"I have so much respect for them. Every dive they do, they're picking up rubbish from the bottom of the ocean, working hard to keep the place clean for the rest of us.

"They're a really down-to-earth group but they don't shout about what they do loudly enough, so I try to do that for them."

Mind you, a past NARC experience does count among Miranda's worst dives.

"There have been plenty of dives where things have gone wrong – I've got tangled up, run out of air, couldn't find the wreck, lost the contributor etc.

"But I think for most divers the worst diving is when you can't see anything. You've gone to all that effort of getting kitted up and jumping in only to find that the vis is thick pea soup.

"We did a rubbish-clearance dive for *The One Show* that went really well. We filmed the recovery of lots of fishing-line that had become wrapped around dead men's fingers, plumose anemones and spider crabs, along with lots of bits of plastic and beer cans.



"I went back several months later to do a similar story for Radio 4's *Costing the Earth*. Bit unusual to have diving on radio, but it was very atmospheric!

"That's all I can say about this dive, because we didn't see a single thing – literally. I could barely see Dave, let alone concentrate on clearing any rubbish.

"I think we might have held hands for most or even all of the dive – thank goodness it was radio and not TV!

"Thankfully, much of what we talked about was that previous dive we'd done together. You can do the same site several times and the experience can be completely different – I think that's what I love and hate about British diving!"

SUCH EXPERIENCES are outweighed by the many positive ones, and when I ask about UK highlights it's another seal hotspot that leaps to Miranda's mind – the Farne Islands.

"It's the place I try to visit every year, though last year I didn't manage it. The grey seals are just so used to humans, and so inquisitive.

"I remember diving there for the first time with *Coast*, after everyone had been telling me how amazing these encounters were. We spent 20 minutes in the water, didn't see a single seal and I remember thinking: this really isn't that amazing.

"Suddenly all that changed, with one seal coming in to play and interact, pulling on every hose and every bit of kit.

"They just want to be with you in the water, and we've filmed some really unusual behaviour with them.

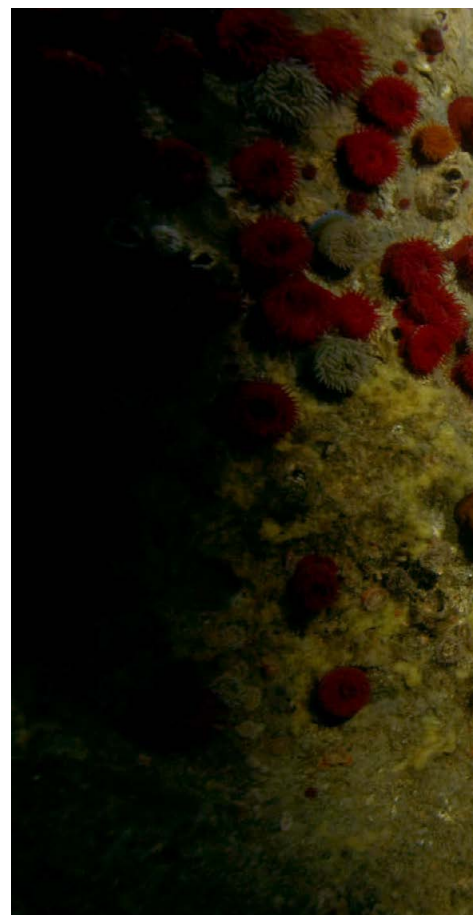
"We filmed up there a couple of years ago for *The One Show* with Ben Burville, who dives with them all the time.

"He showed us where the juvenile seals would cross this patch of gravel and rub their tummies or their backs on it.

"We sent this footage to various seal scientists. Some said it was posturing, others that they were trying to get parasites off their skin – every one had a different idea of what this behaviour was.

"So we can still dive a familiar site with a familiar animal and see behaviour we haven't seen before, because we just don't spend enough time in the water.

"Watching something like that gets me really excited, and I'd love to dive with the seals at night to see what they do."



THE FARNES ARE well-documented, so what about a “best-kept secret” dive-site?

“Well, a total secret actually. At the other end of the country is a site in Dorset so secret I can’t even tell you where it is.

“I was with Paul Naylor to do a piece about tompot blennies for *The One Show*. He took me to a rock with horizontal crevices like high-rise flats, all covered in weed and very pretty and colourful.

“In every crevice there were just stacks and stacks of tompot blennies – males guarding their eggs. Paul explained that you could identify every individual through their unique facial markings.

“He had photographed them and given them all names beginning with B, so there was Benny and Byron and Billy – brilliant!

“He’d created this soap opera, in which the bigger, more aggressive blennies would have more females’ eggs to guard, right next door to marauding velvet swimming crabs that were always trying to nick them if the blennies turned a blind eye.

“It’s just a rock with some fish on it but that’s what I love. If you didn’t know what was going on, you’d just swim past it. We sat there for an hour in 6m of water, watching these beautiful, charismatic fish.

“And that’s why I’m always banging on about how amazing the UK is. We have incredible marine life in amazing locations that are really accessible.



“You can be mesmerised at sites like that. It’s only when someone taps you on the back and shows you the time that you remember what you were doing. I can totally lose myself.”

IF MIRANDA is unlikely ever to exhaust the possibilities of UK dive-sites, there is also the big wide world out there.

“There is a possibility of going to Lake Malawi in October – a 10-day trip with two or three days’ diving in the lake. It’s

full of cichlids and incredibly hot at the surface. If I can get the whole family in the water that would be quite amazing so I’m crossing fingers, but if that can’t happen I’ll hope we can do it next year.”

What about big projects for the future? “I haven’t done enough swimming with big things. I’d like to spend months on a boat finding mass aggregations of whale sharks or manta rays and feeling like this tiny thing in this huge ocean of huge creatures in the middle of nowhere.

“More than anything, I want the kids to experience some of the things I’ve experienced, like the manta rays in the Maldives. I want to make sure that world is still around for them to see.

“I think about going back to places I dived 20 years ago, telling them how amazing it was but realising that the diving isn’t as good any more.

“I hope there are enough places that haven’t changed in that way; that there is enough conservation going on.

“But we’ve got to think really positively and just do what we can. Consume a little bit less and look after the planet a little bit more.”

I ask Miranda if she’s optimistic about a green dividend emerging from the pandemic. “I hope so. If there’s one thing we can take away from the past year it’s the value of nature, of open spaces and open water. Perhaps when things open up people will remember that they found all these really good things local to them, or just decide that they need to reduce their carbon footprint.

“It’s really hard – there are so many people around us doing their bit, and then you look at the bigger picture and think: oh no! But I am optimistic.”

And if an AmbassaDiver doesn’t think we can change the world for the better, where would be?



ROB FRANKLIN

UK WONDERS

Snakelocks Anemone Shrimp, Swanage Pier, Dorset / MATT DOGGETT

The snakelocks anemone shrimp (*Periclimenes sagittifer*) is a warmwater species ranging from the Mediterranean to the Azores and, prior to 2007, was found only as far north as the Channel Islands.

Since then the shrimp has become well-established along the Dorset coast. It's a favourite among local Seasearch divers and underwater photographers alike, and always a joy to find under water.

Despite its extravagant colour, the shrimp can often be very hard to spot. It lives protected among the stinging tentacles of the snakelocks anemone that also frequents warmer waters.

When not lit with a torch or a flash, these tiny shrimp can be quite transparent.

Breeding females can often be much larger, with more vivid pink and white colours along their bodies. Non-divers might be able to find these shrimp among some of our deeper rockpools – so keep your eyes peeled this summer!



IN PICTURES

WE HAVE THE Marine Conservation Society to thank for this colourful and inspirational collection of images from home waters, as well as the leading photographers who took them, many of them during 2020.

"From the Jurassic Coast of Dorset to the northernmost waters of Scotland, there is a

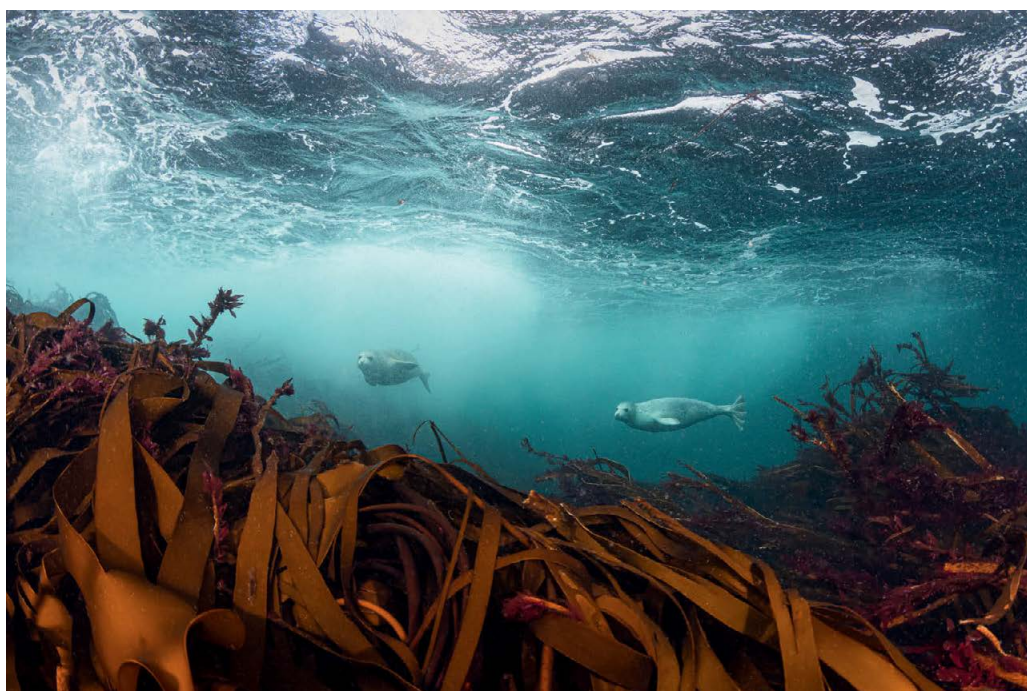
huge array of incredible landscapes and animals beneath the water's surface in the UK," says the MCS, which hopes that divers will read the stories behind the photographs, enjoy some unexpected sightings and get inspired to head to the UK's coasts and seas as lockdown eases and summer draws closer.

The MCS runs a sightings programme,

asking beachgoers to report animals including jellyfish, turtles and basking sharks when they spot them in UK waters. mcsuk.org/sightings

Meanwhile divers are invited to join Seasearch, the volunteer diving programme that monitors underwater life, with the added opportunity to hone underwater photography skills. mcsuk.org/get-active/seasearch

FORESTS OF THE SEA



Grey Seals in Surge,
Eilean Cluimhrig, Loch Eriboll /
KIRSTY ANDREWS

The grey seals on the north coast of Scotland are not as accustomed to divers as in some UK locations, but it was fun to watch them enjoying themselves at a distance.

They were far more comfortable in the surging waves than I was, as I clung on to kelp to capture this photo.

Young Lump sucker,
Kinlochberrie, Sutherland /
ALEX MUSTARD (4 Nov, 2020)

This young lump sucker was about the size of a tennis ball and was living attached to the blades of sugar kelp.

My buddy Kirsty Andrews found this one and I photographed it with one of my flashes backlighting the kelp to reveal its golden colour.

As always with great finds, it was at the end of a long and chilly November dive, so I had time only for a few pictures before I had to bid it goodbye.

I like the featherstar arms peeking into the background of this image, which are so characteristic of this area in the far north-west of Scotland.



FORESTS OF THE SEA (contd)



Spiny Starfish, Wembury, Devon / PAUL NAYLOR (4 June, 2020)

This starfish (*Marthasterias glacialis*) slowly walking up to the top of the kelp canopy was seeking a good vantage point from where it could release its spawn. A chemical sent out by females with their eggs prompts neighbouring starfish to join the party.



Common Sun Star, Loch Carron, Wester Ross / DAN BOLT (8 Sept, 2020)

I spotted this large common sun star at the end of a dive in the loch. It was quite hard to miss, actually! It was on the vertical face of the slipway I use to enter and exit the water.

More often found on the seabed or on reefs, this one spent a few hours snuffling around on the pier. At the end of my third dive it had disappeared – quite a hard trick for such a large, brightly coloured animal!



Brown Crab Among Dense Animal Turf, Falls of Lora, Loch Etive / JAMES LYNOTT (15 Aug, 2020)

Situated at the narrow entrance to Loch Etive, near Oban, the Falls of Lora has a reputation of being a bit of a scary dive.

Given that the tide races through creating upwells, whirlpools and standing waves, it's easy to understand why. But done at the right time, it's an excellent site and easily a favourite shore-dive of mine. There is such amazing underwater topography and proliferation of life at this site, and there was plenty to admire and photograph.

While swimming along one of the gullies this crab caught my eye as it seemed to be comfortably nestled into the yellow breadcrumb sponge and hydroids surrounding it.

CREATURES OF THE DEEP

Flabellina pedata Nudibranch, Swanage Pier, Dorset / DAN BOLT (14 July, 2020)

The colours of this nudibranch make it not only one of our most flamboyant, but also easiest to spot! In a dark area under the pier, this individual was making its way along a stalk of kelp.

A flash of pink and purple in my torch-light caught my eye, so I had the pleasure of observing it for several minutes before I moved on.

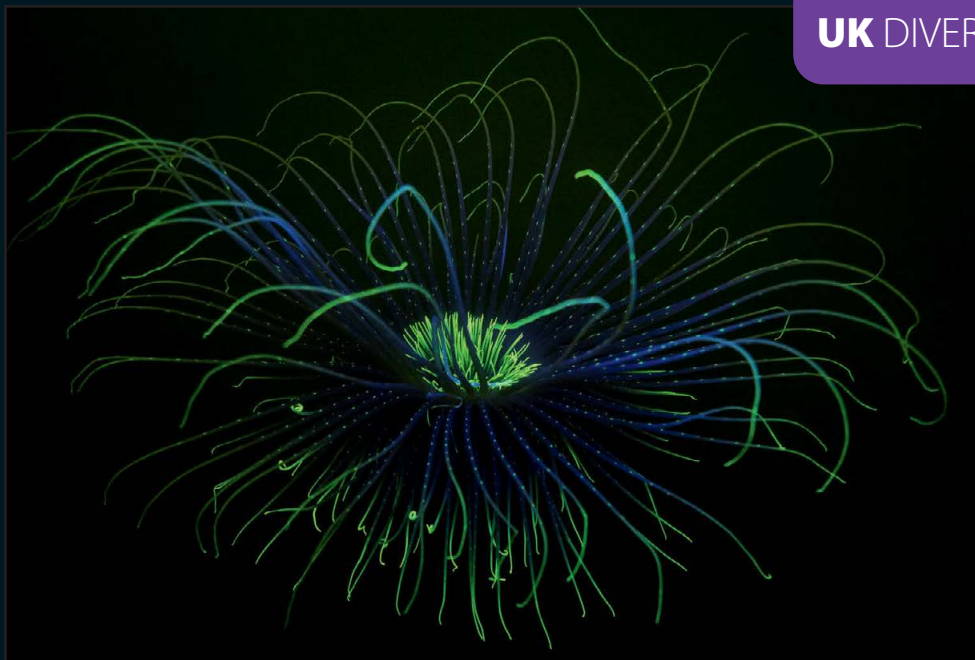


**Fluorescent Fireworks Anemone,
Inveraray, Loch Fyne /
JAMES LYNOTT (19 July, 2020)**

Over recent years underwater fluorescence photography has become a passion of mine, particularly in British waters. I never know quite what I'm going to find that will fluoresce under the blue (near-UV) light.

After spending the day diving at the Garvellachs, my buddy and I decided to stop for an evening dive in Loch Fyne. The site we decided on at Inveraray slip is fantastic for fireworks anemones.

This particularly large individual was a favourite of mine from this dive, because I was able to capture the whole anemone with its long tentacles stretched out within frame.



**Tompot Blenny, Babbacombe
Beach, Torquay, Devon /
KIRSTY ANDREWS (June, 2020)**

This tompot blenny is presenting a smiley face to the camera but he's actually carefully guarding a stash of eggs in the crack behind him.

Male tompots can be quite feisty in guarding their territory, which they keep clean and tidy, ready for several females to lay eggs in, if they're lucky.

They will fertilise the eggs and guard them for around a month in the early summer.



**Bobtail Squid, Loch Long /
MARK KIRKLAND (Sept, 2020)**

I was solo diving at a site called A-Frames, which gets its name from the huge sunken concrete blocks that once formed a large pier.

They're a great anchor point for marine life, so there's usually something interesting going on. It's only an hour's drive from Glasgow so I dive there regularly.

Within minutes of entering the water I found my first one, then my second – and my third. They were everywhere!

They're quite comfortable around divers, but will burrow in the sand when they've had enough. That's exactly what this one was starting to do when I snapped this shot.



**Sea Hare, Swanage Pier, Dorset /
KIRSTY ANDREWS (June, 2020)**

Sea hares look brown and sluggish at first glance but if you look closely they have delicate patterns and colours. I used a snooted spotlight effect to show this off and highlight the head tentacles, which do resemble a hare's ears.

INTO THE BLUE

Blue Shark, Penzance, Cornwall / ALEX MUSTARD (29 Sept, 2020)

I had seen blue sharks in British waters only once before, so was delighted to get the chance on a sunny day. After a few hours waiting the sharks started arriving.

As their numbers built up they became more confident and rewarded me and my buddy with plenty of close passes.

This frame of a beautiful female slicing through the autumnal sun was a favourite and stands out because of the blobs of atmospheric lens flare.

Blue sharks are sadly the world's most fished shark, so it was a real treat to see them.



Bib or Pouting, Jurassic Coast, Dorset / MATT DOGGETT (15 Aug, 2020)

Photographing these large shoals can be a challenge because the fish are highly reflective and change direction constantly. One summer day I was drifting through crystal-clear waters over an area of huge boulders, the tops of which were covered with red seaweeds, sponges and antenna hydroids.

Suddenly I was joined by this small shoal of bib (*Trisopterus luscus*) which swam alongside and just in front of me for several minutes.

They would often bunch together nicely, allowing me to snap away as we floated along in the gentle current.

Relaxing dives like this give you fond memories of British diving and keep you coming back for more.

Atlantic Puffin, Fair Isle, Shetland / KEVIN MORGANS

When photographing an animal, eye contact is a critical component, allowing your viewer to connect with the image.

This image breaks many of the traditional rules. The setting sun, the uneasy pose of the puffin and scene all throw up many questions and thoughts.

Where is the puffin looking? What is it thinking? What lies beyond the horizon?



Basking Shark, Isle of Coll / MARK KIRKLAND (July, 2020)

I've been to the Island regularly in the past few years to photograph this huge fish as it migrates up the west coast of Scotland. I wanted to do something different from the classic head-on open-mouth shot, so I had a custom bit of photography gear built to try to take split shots – something rarely seen.

It was two years in the planning and a real technical challenge because of the dark, plankton-rich waters but I had a glorious week on the island with multiple dreamy encounters. This shot was taken on the last night, just as the sun was setting. 



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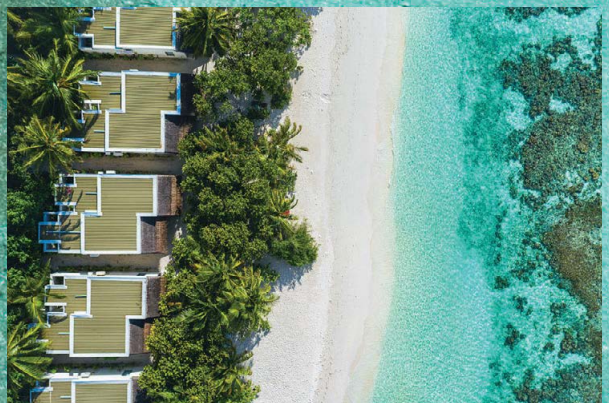
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THOSE WERE THE DAYS!



CROWN OF THORNS by Peter Vine (1973)

"I have the poisonous and infamous crown-of-thorns starfish to thank for five years of living on and under the Red Sea. The poison never worried us – in fact after weeks of almost daily stings, we began to experience mild 'highs' that were far from unwelcome," says Dr Peter Vine.

"The Cambridge Coral Starfish Research Group, of which I was a member, studied many aspects of the spiny starfish's life, including its vulnerability to predation.

"Living literally on the reef, on a flimsy platform (*opposite page*), enabled us to get to know individual fish by their given names – not just scientific (*Acanthaster planci*) but more personal, like Popeye the puffer (*Arothron hispidus*).

"My photograph of Popeye chewing on a crown-of-thorns starfish provided the evidence that scientists were seeking regarding this important natural predator.

"The picture made it straight onto the cover of one of the most prestigious scientific journals of the day: *Nature*."

Dr Vine is a marine biologist with a

special interest in coral reef ecology. Author of four books on the Red Sea and a number of scientific papers, he recently published his memoirs, *Spirorbis: Stories From My Life*.

He began his underwater photography in the central Pacific, on Tarawa, then part of the Gilbert & Ellice Islands – now Kiribati.

As well as taking marine life stills he has been actively involved with underwater filming and shares the credits for *Nightlife*, which was nominated for an Academy Award. He is currently executive producer for a film about climate change.

Inspired by the period diving tales in Peter Vine's new book *Spirorbis*, he and his dive-buddies reminisce over some memorable photos – and we also bring you two extracts from the book



DOUBLE EXPOSURE

by Hans Sjoeholm (1985)

Hans Sjoeholm is a well-known diver, instructor and photographer based in Jeddah, Saudi Arabia. He is known for his technical expertise in underwater photography and remembers techniques that have since been replaced by the vast capabilities of digital enhancement.

The image below from his archive is a double exposure with film. First, he shot the scene with the brilliant Nikonos 15mm wide-angle lens, then followed up with a macro shot made with the help of an extension tube on a 35mm lens on the same film frame.

As he says himself, it was “old school – the days before Photoshop, when these effects were all captured under water”.





FREEZE FRAME

by Doug Allan (1980)

“My memories of diving for the British Antarctic Survey more than 40 years ago were frozen into my mind and captured for posterity with my trusty old Nikon F2 in my Oceanic housing,” says Doug Allan.

“A 10mm wetsuit, twin-hose Mistral regulator, and Fenzy lifejacket was the height of chic for us back then.

“The ice by the end of winter could be 75cm thick and you needed a long blade to cut all the way through it. Two parallel cuts about 1m long and 75cm apart, then three cuts at 90° to the first two left you with two free-floating blocks in the hole.

“Blocks were too heavy to lift out, so we just pushed them down and to the side of the hole, where they refroze to the underside of the ice.

“The diver was on a safety-line with an apple float about 1m out from him to keep the line off the seabed.

“Life was not without its risks, and we were often on thin ice, both figuratively and literally – resulting in rescue missions to retrieve lost equipment, or even the odd snow machine. We recovered this one using oil-drums as lifting bags.”

Doug Allan spent seven years down south working for the British Antarctic Survey, before changing direction to full-time freelance filming in 1984.

He has since worked for the BBC, Discovery, National Geographic and many others, filming to great acclaim for series including *The Blue Planet*, *Planet Earth*, *Frozen Planet*, *Ocean Giants* and *Forces of Nature*.

His awards include eight Emmys, five BAFTAs and an Honorary Fellowship of the Royal Photographic Society, and his book *Freeze Frame: A Wildlife Cameraman's Adventures on Ice* is available through dougallan.com



JEDDAH

by Hagen Schmid (1977)

“Memories of diving 40 years ago are dominated by a fixation with black – black wetsuit, black fins, black boots... even the snorkels were black – and this colour fatigue was repeated ashore by the searingly hot desert sands,” says Hagen Schmid.

“But under Saudi Arabia's tepid Red Sea waters, we were regaled by a magnificent kaleidoscope of colours, inviting us to explore the reef's hidden treasures.

“We didn’t need much persuading. Scuba was still in its infancy, and when local engineers needed underwater construction or repair jobs, they were as likely to call on us amateur sports divers as they were with the few ‘hard-hats’ still plying their trade.

“Coastal cities such as Jeddah depended on large desalination plants that converted sea water to fresh drinking water. Any restriction of flow through the intake pipe could cause a shutdown in the city’s water supply, and storms regularly created mounds of loose rubble in the pipe.

“We had the task of clearing blockages resulting from fallen rocks, washed up plastic or even jellyfish – a good money-earner at the time.

“We constructed an underwater cable-car to ease the removal of rocks into deeper water. Thanks to water temperatures of 28-30°C, we could dive in T-shirts and old jeans all year round, and the black neoprene was saved for more sporty Friday-morning pleasure dives.”

Schmid is something of a legend in Arabian diving, having opened the region’s first dedicated dive-shop and filling station near the old Jeddah airport.

He took up photography at an early stage and played important roles in



several conservation initiatives, including the Saudi Arabian Natural History Society.

Author of several highly illustrated books on the Red Sea and co-author, with Peter Vine, of *Red Sea Explorers*, Hagen

assisted on several films and scientific expeditions in Sudanese and Saudi waters. A fearless champion of the marine environment, he has long urged conservation legislation and its enforcement.

...and here are two stories extracted from Peter Vine's book *Spirorbis*, set in the Solomon Islands and Sudan...

I NEARLY SANK THE ROYAL NAVY

The loud *whoosh* as air stored at high pressure gushed out of the inflatable’s hull came as a complete shock to everyone, not least myself, who was, by any measure of law, the guilty party.

I believe I was also the first to predict its potential consequences. The stakes were higher than I cared to imagine.

But my guilty feelings did not seem to communicate themselves through the protective layers of wetsuit, mask and breathing hoses.

It took just a few seconds above water to realise that my culpability was not apparent to observers and, most importantly, the boat’s crew. The crew were now in rapid response mode, intent on saving both their inflatable and themselves.

Had nobody noticed that the rapid deflation of their now-sinking vessel coincided, in faultless synchrony, with my own emergence at the side of the dinghy? Based on a quick look around, I realised that this was indeed the case.

My heart sank, however, when I learnt the identity of my unsuspecting and unintended victims. I had just mounted a one-man attack on the British Navy, and it wasn’t over yet.

“Number one: emergency kit,” I heard the voice of authority belch out in a clearly identifiable Liverpool accent.

I should explain at this point that the events unfolding had the potential to cause

an international incident. These were not British waters but the heart of the Sudanese Red Sea.

The British Navy had sent a warship on a peace mission to Port Sudan – something that not everyone had welcomed. Was this incident going to be interpreted as a hostile act by local forces?

I slipped back under water and let go of my grip on the offending weapon. It was a short swim to my own boat, tethered to the same historic wreck that the Navy divers had been visiting.

As I climbed on board, the spray of air and water was still spurting out from just beneath the waterline; the naval dinghy’s form had begun to collapse into something more like a deflated plastic turtle than a fast offshore launch.

My mind raced through the irony of this bizarre situation. I had been diving on a ship full of bombs, shells and other armaments that had

been scuttled in 1940 when Italy joined World War Two.

On that occasion the British had arrested the *Umbria*, only to be outsmarted by its Italian captain, who scuttled the ship, opening some water intake valves, flooding its holds, and placing its cargo of munitions beyond wartime use.

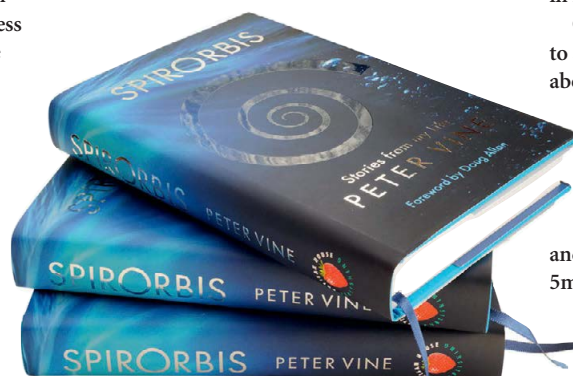
Thirty-five years later, British sailors were once again under attack, but this time by their own side, scoring something akin to an own goal.

Only a few minutes earlier I had been swimming at about 35m depth inside the bridge of the historic ship, making my way along the corridor leading to the first class accommodation.

It was a dive I had undertaken on numerous previous occasions, always with an eye for objects that could form part of a collection for display in a mooted *Umbria* museum that would be set up in Port Sudan.

On this occasion my attention had been drawn to a window that was precariously balanced, about to fall from its rotting frame. A large grouper swam back and forth through the window opening.

Imagining how appropriate it might be to construct display cases from the sunken ship’s own glass windows, I rescued the panel and pushed off from the ship’s side. At around 5m depth I looked up through the clear sparkling waters of Wingate reef to the glittering surface, recognising – or so I thought – our dive boat’s hull, and stretched



up my arm to grab the surrounding rope rail.

Pulling myself clear of the surface, a corner of the window made contact with the rubberised float, triggering this calamitous *whoosh* – a near-fatal blow to someone else’s boat. Who was going to believe the innocence of this act?

My offer of assistance politely declined, I held my breath as what was left of the beleaguered vessel limped back to the mainland, barely buoyant enough to keep the outboard afloat.

By this stage, the crew had roped themselves together and had been allocated a series of tasks that appeared to form part of a well-practised emergency routine.

Later that afternoon, our team was invited on board the naval destroyer for a cocktail reception. Nothing was mentioned of the near-sinking, and I decided that silence was my best defence.

RISKY SCUBA

Scuba-diving in the early 1970s could be quite haphazard in terms of skills, knowledge and safety. I have already referred to regular dives to 60m or more, casual decompression discipline and unaccompanied dives, together with use of explosive shells instead of prongs on spearheads.

The Solomons provided a wake-up call that my diving buddies in New Zealand would have simply not tolerated.

I joined a Sunday gathering of the newly formed association. Almost 30 folk gathered

at the *Bonegi One* wreck-site. For most of the afternoon they chased fish in a relatively small area, loaded spearguns pointing at each other almost as often as at a fish.

There had recently been a snag with the type of gun they were using, which had been firing automatically without pulling the trigger.

I saw several loaded guns leave the water – a cardinal sin. Most spearfishing was done with scuba tanks on their backs.

The divers had kindly arranged for me to have a scuba dive, and I waited until the shark-feeding hour, just before sunset, to know who would be my buddy. Then I learned that I would be alone on the dive.



Reluctantly I set off along the surface with Ray, who was snorkelling. About 200m out from the shore, he stopped.

“OK, Pete, if you head straight down from here, you’ll hit the stern of the wreck on the bottom. Shouldn’t be any problem.” And I dived.

I knew this was wrong but felt that a quick dive by myself, to 20m or so, would be safe enough.

I kept swimming straight down. Surely I should be near the bottom by now? I must be 30m deep.

I already felt a mild narcosis. It was dark, too, since the last rays of sunlight were glancing off the sea’s surface.

I could see the wreck now but, Jesus, it was at least 40m deep. I checked my depth gauge: 39m, and the wreck still below me.

The intensifying narcosis accentuated my anxiety. *I must be careful*, I thought.

My lips were numb, and I could not feel the mouthpiece that was delivering my air.

I hit the wreck. Alone and lonely. A giant grouper lurked in a massive hole, created by salvage divers, at the stern of the ship. Pearl oysters clung to the tangled metal.

I tugged at these to fill my sample sack and felt narcotic fuzziness cloud my mind.

That’s enough, I thought as I pushed off and made for the top.

Back ashore, I tackled my friend. “How deep is the stern of the wreck, Ray?”

“Oh, about 50m, Pete. Why do you ask?”

There was little to be gained by an argument. █

DIVER

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BOOKING NOW

WINDJAMMER EXPERIENCES

Windjammer Landing Villa Beach Resort on St Lucia is showcasing two new educational diving excursions for certified Open Water divers or above.

They have been devised with research organisation Perry Institute for Marine Science and PADI 5* dive-centre Eastern Caribbean Diving, which is based at the resort.

The Family Experience package, for divers aged 10 and above, includes three days of two-tank dives that allow visiting families to opt for preferences such as reef, drift or wreck dives, and coral, fish or invertebrate exploration.

Educational briefings take place before each dive and the package costs US \$275pp.

The resort's other new option is its Environmental Package, created for divers keen to get involved in coral-restoration diving. The six dives include the PADI Reef Rescue Diver



course and hands-on experience. The price is \$305pp, including certification registration and marine-park fees.

A Lionfish Experience is also offered, including diving, hunting, cleaning and cooking of the invasive species.

Rooms start a US \$266 per night with villas from \$448. A 10% donation from each package price goes to the Perry Institute to support its programmes on the island.

▶▶ windjammer-landing.com

Talking of diving in Portugal – and doing it

An “international diving congress” called Diving Talks takes place in the Portuguese resort of Tróia, a bus-ride south of Lisbon, from 8-10 October.

Attendance, accommodation and dive-packages are on offer, with the opportunity for guests to extend their

long-weekend stay for more diving.

Diving Talks features presentations from 26 divers, including Ahmed Gabr, Jill Heinerth, Marissa Eckert, Mark Powell, Martyn Farr, Natalie Gibb and Phil Short. It's based at the Aqualuz Tróia Family Hotel, where two sharing



can pay 580 euros for B&B and full weekend tickets covering the two days of talks, exhibition, three lunches, refreshments – and a dive each.

Guests are also invited to arrive early or stay late and add one of many week-long packages offered by tour operator Portugal Dive, which covers mainland Portugal as well as the Azores and Madeira.

Or take it to the limit: its “Scuba Diving Portugal from Top to Bottom” package from 2575 euros pp involves 19 boat-dives over 13 days, taking in Porto, the Berlengas Archipelago, Sesimbra, Fonte da Telha and Praia da Rocha.

Two share B&B in a 3* hotel, a hire car with GPS and various extras. Tech divers can be accommodated too.

▶▶ divingtalks.com,
portugaldive.com



SARDINE FEAST FOR NEXT YEAR

Mega fauna specialist Amos Nachoum has been attracting even more attention than usual through the documentary on his polar-bear dives, *Picture of His Life*.

If you want to go on a small-group trip with him or his Big Animals Expeditions team, it might not be cheap but it will be memorable.

“Come with us to South Africa and witness the unforgettable wildlife spectacle that is the Sardine Run, the greatest show on Earth,” he suggests, and it's a tempting offer if you have US \$9800pp to spare.

The stars are the baitfish that gather each year on South Africa's Wild Coast in KwaZulu Natal, while the significant players are the sharks, dolphins, whales, game fish and seabirds that come along in hopes of a square meal.

The 14-day expedition starts on 11 July, 2022, by which time we hope travel will be largely back to “normal”. The price covers accommodation, scuba and extensive freediving and car and boat transport.

There are also eight-day striped marlin trips set for Baja Mexico in October 2021 and 2022, and seven-day sperm whale trips in October and December of both years.

▶▶ biganimals.com

Blue online

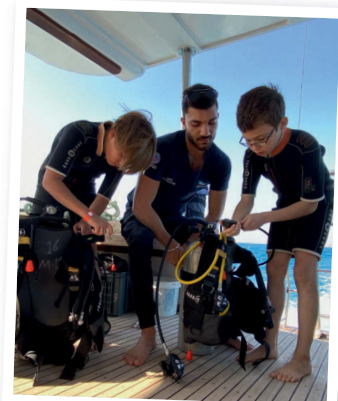
“It's not that we don't want to talk to you – we just wanted to make it much easier for you to book with us,” says Blue O Two, announcing its introduction of online booking.

“We've finally moved with the times so you can make the most of yours.”

Follow the pink button on the operator's website home page to book with immediate confirmation – it's easier, quicker, more efficient and you can manage your booking online, according to Blue O Two.

▶▶ blueotwo.com

MASTERING THE ART OF DIVING IN HURGHADA



If you're planning a trip to the Egyptian Red Sea, Master Diving Centre is part of the 5* Serenity Makadi Beach Hotel in Hurghada and says that it welcomes divers from anywhere in the area. It arranges recreational dives from the marinas in both Hurghada and Safaga as well as from the hotel, and offers the full range of PADI training courses.

Daily two-tank dive packages start at 50 euros pp, including transfers, lunch and refreshments, and equipment hire is available.

▶▶ masterdivingcentre.com



Megamobula action in the Sea of Cortez

From mid-May to July, thousands of mobula rays aggregate in the deep south of the Sea of Cortez off Mexico, and Nautilus Dive Adventures has unveiled seven-night expeditions to witness the migration first-hand

aboard the 35m *Nautilus Gallant Lady*.

The Nautilus crew have been plying the Sea of Cortez since 1974, and say they know some of the best secret spots for unique animal encounters.

Guests will be able to snorkel and freedive not only with the rays but with predatory pods of orcas.

Dolphin pods and even sperm and fin whales are possible sightings.

But also on the week-long agenda is the possibility of



swimming with whale sharks off La Paz and snorkelling and diving with sea-lions at Los Islotes.

There will also be a day's diving at Cabo Pulmo National Park, home to a reported 6000 marine species,

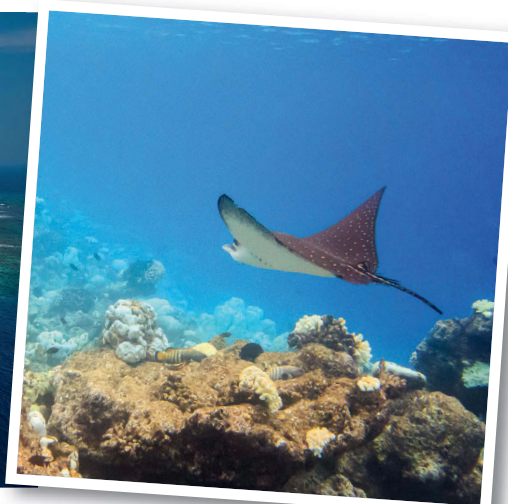
and snorkelling at protected Isla Espiritu Santo.

The liveboard accommodates small groups of 12 divers in six large suites, and the trip costs US \$4000.

►► nautilusliveboards.com



MALDIVES FOR DIFFERENT FOLKS



A key budgetary consideration ahead of travelling to the Maldives is whether to choose a resort with all-inclusive, half-board or pay-as-you-go offerings, says Atmosphere Hotels & Resorts.

It adds that what sets it apart is that its four resorts all have all-inclusive resort plans to cover accommodation,

all food and beverages, spa treatments, snorkelling excursions and activities (though not scuba-diving!)

It suggests laid-back Atmosphere Kanifushi as well-suited for first-timers and families; OBLU Select at Sangeli as ideal for honeymooners and vow-renewers; and newest resort VARU by

Atmosphere, with its authentic Maldivian cuisine, architecture and visits to inhabited islands, as a good bet for culturally curious travellers.

All provide opportunities for diving and snorkelling, but the resort most dedicated to that cause is OBLU Helengeli, with its 116 villas & suites in

easily accessed North Male Atoll.

The most recent rates show beach villas on the island plan from US \$259pp per night (two sharing) and a package of 10 dives costing \$510.

►► atmospherehotelsandresorts.com

Insight into Azores

From August 5-18 DIVER contributor Daniel Brinckmann, with a solid year of Azores diving experience under his belt, leads a 13-night group trip for eight to Pico.

The idea is to combine local highlights (two day-trips to Princess Alice Bank, three shark dives, four local dives, two whale-watching and two dolphin snorkelling trips) with citizen science.

Guests will be there for the tagging of megafauna such as sharks and mobula rays for "Project Megalodon", a joint venture of Pico Sport with the University of the Azores to track the migratory routes of these species.

The price, which includes flights from London, B&B in a guesthouse (two sharing), diving and presentations by a marine biologist and Brinckmann, starts at 2549 euros.

The trip is organised by Absolut Scuba.

►► as-tauchreisen.de



PLAN AHEAD FOR GALAPAGOS

Amid current travel uncertainties, one sound idea is to book bucket-list trips to look forward to well into the future.

Down for 2022 is Ultimate Diving's specially negotiated date to send divers onboard *Galapagos Aggressor*, with the first eight to sign up promised a £350pp saving.

The trip departs on 13 October, and you're fairly unlikely to return without having seen sea-lions, turtles, penguins, eagle rays, iguanas, golden rays, seals, hammerhead or even whale sharks.

Seven nights (two sharing) with diving costs from £4795pp.

▶ ultimatediving.co.uk



House party delayed

We told you about the "Sunset Submersion" extravaganza in May at Sunset House in Grand Cayman in December's *Booking Now*. Like many a grand plan that's been postponed to 2022 now, though the resort was still "tentatively planning" to reopen this month.

The resort and Sunset Divers are now selling holiday places in advance as \$750 vouchers. When the trip comes off you get \$250 of that back – \$100 off the package, \$100 dive-credit and \$50 off food & beverages.

▶ sunsethouse.com

Waiting it out in Mexico

In Mexico, the resorts linked with Pro Dive International are open, and the dive-centre chain reports being "back in full swing with our diving operations" – though it then goes on to add that the divers are benefitting from going out in small groups with few other boats or divers in sight!

It is offering 10% off all diving pre-booked online for whenever you can fly. It can be found at six resorts in Riviera Maya, another six in Cozumel and one in Cancun (it also has two in the Dominican Republic) and all are now open.

▶ prodivinternational.com



Happy returns

Big welcome-back savings and "worry-free" bookings are promised by the Atlantis Philippines dive resorts in Dumaguete and Puerto Galera.

Atlantis says many previous guests asked how they could help out during the pandemic, and its answer remained: "Please book a trip and come as soon as you can."

If you book a new holiday to be taken during 2021 it has been offering 35% off normal rate for deluxe and upgraded accommodation with meals and up to five dives a day.

And Atlantis says you'll be able to reschedule your holiday for up to 18 months at the same rate.

▶ atlantishotel.com

Before you check in... check out

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TRAVEL

Back in the Air... back in the Swim

The vaccination programme is well underway and it's time to start thinking about shaking the moths out of your dive gear and checking the time left on your passport. Gill Fishery offers her six top tips for planning dive travel in 2021.

[Read more...](#)

Diving Talks on Portuguese coast

An "international diving congress" called Diving Talks is to be held in the resort of Tróia, just south of Lisbon in Portugal, from 8-10 October this year.

[Read more...](#)

Inland Sites Diver's Guide 2021

The year of coronavirus caused many divers who would normally slip away to warmer waters to consider options closer to home.

[Read more...](#)

Volunteering to get away

There are still ways to get away to more exotic climes for long periods, especially for younger divers.

[Read more...](#)

Remote working – from the Maldives?

The trend towards offering extended diving holidays for those in a position to seize the opportunity – particularly the well-paid who can work remotely, and retirees – is continuing.

[Read more...](#)

Worldwide's small-group trio

Dive Worldwide has introduced three group trips, each to a small resort where it's hoped that the 6-10 guests will enjoy on land the type of bonding usually associated with liveaboards.

[Read more...](#)

Big Blue beckons in March

Pharaoh Dive Club owners Clare and Steve Rattle have been working and diving around the Egyptian Red Sea for nearly 30 years and run the popular Roots Red Sea centre which, as they fairly say, put the town of El Quseir

Lily on the bright side

"For the past year my staff have been whispering to me that we needed to part with our faithful RIB... It was time for a new, fresh boat with more options and possibilities."

[Read more...](#)

www.divernet.com

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WELL AND TRULY TESTED



A new crossover wing from Mares gives STEVE WARREN the chance to reflect on contrasts between rec and tech diver requirements – and also how they can coincide.

Plus: a regulator combo suitable at all levels

BC

MARES XR-REC SILVER BACKMOUNT SINGLE CYLINDER SET

BEFORE WE TALK ABOUT THIS BC, let's talk regulators. In 2005 a major brand introduced a twin-hose reg, a modern take on the original regulators that, for very good reasons, had been eclipsed by single-hose models by the late 1960s.

A **DIVER** reader bought one, then wrote in to complain about how badly it breathed. Of course it did – it was a twin-hose! Using such regulators requires the diver to put up with that, and know the tricks that make it “less worse” to use.

A twin-hose remains the first choice of some underwater photographers and film-makers, me included, because it exhausts bubbles behind your head, out of your field of view. But using one only because it looks cool is to invite disappointment.

Buying a technical BC without understanding how it differs from a recreational model does the same. The two might look broadly similar, but the differences are important.

The Mares XR-Rec Silver Single Backmount back-inflation BC is an extended-range recreational wing designed to appeal to divers planning to progress to technical diving, or those already there who are looking for a travel-friendly wing for single-cylinder diving.

Technical divers adopt philosophies that are still ignored or cherry-picked by recreational divers like me, and some tech BC features can seem to be overkill. But their inclusion reflects that an equipment-failure in a cave, for example, might be far more dangerous than in open water, and that simplifying equipment can reduce fail-points at the expense of convenience. Inconveniences can be overcome through training and practice.

So, given that this is a crossover BC, I'll try to explain those differences.

The Design

The first big difference is the use of an aluminium backplate rather than a conventional plastic backpack. The claimed advantage is better trim, achieved by counteracting the

tendency of the buoyancy of your lungs to raise your head.

The plate has lots of slots for customising it to different divers' builds and heights and to reduce its weight for travelling. Other holes allow you to install accessories such as stages and battery-packs for lights, equipment recreational divers don't normally carry.

It's substantially padded for your comfort.

As a technical wing, the XR-Rec is designed to be modular. Although it's an off-the-shelf model, a different air-cell could be fitted to the backplate to provide more lift for diving twins, for example.

The webbing isn't sewn into the backplate, so it can be unthreaded to make it easy to add D-rings along most of its length.

It comes with a medium-sized pre-bent D-ring on each upper shoulder, which can be adjusted along the strap.

The idea is to allow you to make discreet adjustments to ensure that accessories such as torches are within the easiest reach possible or kept out of the way.

Another standard D-ring hangs off the lower end of the left shoulder-strap; another sits on each side of your waist. These four are sewn in and can't be repositioned.

A small roll-up pocket hangs from the right hip. The harness has a single shoulder-release buckle on the left, made from alloy like the D-rings to minimise weight. The conventional cam-buckle on the waist-strap is stainless steel.

There's also a jock-strap with a loop for the waist-strap to thread through. A metal D-ring at the front serves as a scooter-ring and another in back can serve to clip on a light canister or reel.

The air-cell is a doughnut type, so air can freely migrate to the highest point regardless of your



changing attitude in the water. There is 16kg of lift, in the ball-park for many medium-sized recreational single-tank BCs.

It's a double-bag design, so the urethane air-cell is protected by an outer shell of 1200-denier and 600-denier nylon.

1200 is a tight weave and puncture-resistant. It's used where the shell might come into contact with sharp edges – as you penetrate a wreck, for example.

600 is a less-dense pattern, abrasion-resistant and used where the shell might rub against the suit or weights while walking or swimming.

Most recreational BCs have a single-bladder air-cell. For a brief period, double-bladder rec BCs were common, but this was only because it became cheaper to make them that way, before a more economical manufacturing process heralded a return to single-bag air-cells.

In technical BCs, the outer cover is felt to provide more protection against abrasion and punctures than can be achieved with a single bladder. The polyurethane air-cell is very heavy-duty in its own right.

The XR-Rec has a direct-feed that differs from

recreational Mares BCs. The inflate and deflate buttons are metal, not plastic, as is the body beneath its rubberised cover.

A length of bungee, rather than a fixed clip, holds the oral-inflation hose and direct-feed whip against the shoulder-strap.

There is no rapid exhaust valve built into the oral-inflator hose. I guess it's felt that this could attract silt and its wearable parts could represent a potential fail-point that could leak air.

Instead, you dump through the mouthpiece or the dump on the lower right of the doughnut.

There's a very small pull-tab on this, presumably because anything bigger creates a greater potential snag-point. Opposite is an overpressure relief valve.

Weights

The XR Rec is weight-integrated. The Mares SLS system, used on its recreational line, is impressive.

On recreational BCs, the two most common ways to ditch weights in an emergency are pinch-clip releases or, as with SLS, grab-handles pulled outwards to jettison the weight-pockets.

The conflict for the manufacturer is how to provide a mechanism that's easy and fast to operate and difficult to activate by accident, such as by snagging on wreckage.

With the XR-Rec you dispense with the SLS, eschew pinch-clips and go with a touch-fastener flap.

This requires you to grab the free end on each side and pull clear, then the weights slide out.

The weights load directly into the pouches, rather than into additional pockets. Optional trim-weight pockets can be added to the two tank-bands, which are provided for stability and security should one band loosen, and closed with stainless-steel over-centre catches.

There is no loop to go round the tank's neck to set the correct height. There is a nylon strap between the bladder and backplate for lifting your set, though I found it easier to use the cylinder-valve.

In Use

The nylon webbing for fitting the BC to your tank takes some effort to adjust. It's easier when the bands are wet.

I dived using a 15-litre steel cylinder and with two 3kg kidney weights loaded into the ballast pouches. I had not been expecting to dive, so did not have the trim-weight pockets for the tank-bands with me. With the weight-pouches already full, I grabbed a weight-belt to add two 1kg weights and get myself properly balanced for my coldwater wetsuit.

Heavy-duty direct-feed with metal buttons and rubberised finish.



Left: Integrated weight set for fast ditching, with release-tab laid over D-ring. Right: Integrated weights set for non-ditchable diving, with strap passed through D-ring.

This amounted to an all-up weight of around 35kg, all bolted onto the XR-Rec and then supported by me. A 300m walk to and from the dive-site, including a very steep 40m slope, proved this to be a very comfortable BC.

Sod's law dictated that my first dive with it was in a nasty chop. I measured the height it would give me above the surface, which turned out to be about 16cm to my lower lip – a very good performance, especially as this was at the start of a dive with 4kg of air in the tank.

The XR-Rec supported me vertically, so I wasn't finning to stay upright, and I was able to ride the swells very nicely.

On many recreational BCs you can rest your left hand on the mouthpiece and press a button to add buoyancy or pull down to vent. It's convenient one-handed BC control.

With the XR-Rec, if you're head-up, venting requires you raise the mouthpiece to dump air.

Many divers do this anyway, despite all those dumps designed to do the job on recreational BCs. They end up letting lots of water into the air-cell. It's not really necessary to hold the mouthpiece overhead to vent – slightly above the level of the air in the BC is enough.

With practice, you can achieve a very controlled and constant ascent rate using this method, by keeping the valve open and the mouthpiece held out nearly straight from your chest. This allows excess air to bleed off automatically as you rise.

The rear-dump toggle, small as it is, is easily found and operated. The direct-feed takes around 10 seconds to fill the air-cell.

Normally, I test BCs to check that the upper dump-valves can vent air faster than a direct-feed that jams open from silting or freezing can deliver it. This is to ensure that a skilled diver can maintain a controlled ascent.

I also hang onto the seabed, fully inflate the BC and let go, checking to see how long a distance is required to fully vent it and stop the ascent.

I didn't do these tests with the XR-Rec, because dumping through the mouthpiece is so fast that it negates the need.

Ditching Weights

There are two ways to rig the integrated-weight closures. The first is for fast, emergency jettisoning; the second prevents ditching by design or accident.

Estimates from safety authorities are that around 80% of recreational divers

who die do so by drowning, something that might often be avoided simply by dropping weights.

This figure has remained constant for decades. Basically, if a recreational diver runs out of air, the desire to reach the surface trumps everything else. The scandal is that training to ditch weights is so dire.

The XR-Rec has long Velcro-tabbed flaps that pass over the weight-pouch D-rings, so these are no longer usable for accessory management.

To ditch, you grab the free end, pull forward and out drop the weights. It's easy to do with or without gloves. However, it's not obvious to a rescuer, because the pull-tab isn't highlighted with a hi-vis strip. There is a reason for this.

Inside wrecks, caves and under ice obviates an escape to the surface, but should a diver's weights accidentally self-release, perhaps by snagging on wreckage or a guideline, the diver might be pinned against the ceiling.

To counter this risk, the XR-Rec releases can be fed under the D-rings and made impossible to release quickly. Diving with "locked in" weights requires that you have both a good reason to do it and systems in place to ensure that you won't ever need to emergency-ditch, such as a bail-out gas supply.

Using the XR-Rec therefore demands that you properly explain to your buddy how your weights are rigged.

Having a hi-vis "pull here" tab could lead an uninformed buddy to desperately attempt to drop your lead in an emergency, when there's actually no prospect of being able to do so.

Another part of your buddy-check should be to explain the shoulder-release. This has a small lever on each side of the buckle, and both must be pushed down for the shoulder-strap to separate. Were fishing-line to catch one release lever, as a real-world example, it would probably skip off the rounded edges anyway, but if it didn't and tripped the release, the other would still hold the shoulder-strap together.

The rear dump-valve toggle is small, but easy to use with gloves.





The metal shoulder-release buckle requires both levers to be depressed to open.

Under Water

The XR-Rec proved to be a star performer. The harness is secure, so it doesn't allow the air-cell to pitch, roll or yaw. At 20m or so, with a bit of air added to neutralise buoyancy loss from my suit, the BC felt streamlined.

Trim was excellent, which helped, and saves on air by reducing the effort expended to move forwards. Because you aren't held in a head-up, feet-down position, you can hug the bottom without kicking up the sand if you fin properly, which is great for looking for artefacts and creatures buried in the seabed.

Stability is near-perfect, so it's an attractive BC for underwater photographers and videographers craving accurate framing, especially when shooting macro. Want to look into a crevice just off the seabed? No worries – just hang upside-down.

Remember that nasty chop I mentioned? It was still there at dive's end. On the surface-swim back to the beach, I was able to confirm that the XR-Rec is a stable and comfortable BC, should you need to fin on your front or back because you came up "near" the exit...

Conclusion

The Mares XR-Rec has a lot of fine qualities. It reflects the tekkie philosophy of adjusting the BC to fit the diver's needs precisely – whether that is getting the perfect fit or the ideal placement of accessories – rather than making do with rough sizing and clipping off kit randomly.

It's comfortable, has superb underwater and surface buoyancy attributes, is rugged and lightweight. While marketed as part of Mares' Extended Range line, it's perfectly at home as a recreational BC. Highly recommended. ■

SPECS

PRICE ▶▶ £539
SIZES ▶▶ One fits all
BUOYANCY ▶▶ 16kg
WEIGHT ▶▶ 3.6kg
CONTACT ▶▶ mares.com

REGULATOR

SCUBAPRO MK25 EVO / D420 / R195 PACKAGE



DURING THE

1960s, '70s and '80s Scubapro produced some of the most recognisable regulators around.

Often at the forefront of design, the brand can lay claim to many innovations we take for granted today and is highly regarded.

More recently the regulator market has seen makers increase their ranges and change models more frequently. Modern regulators rarely get to stand out and become classics. They lack identity.

The D420 slightly bucks this trend. The underslung second stage has been a fixture in Scubapro's line-up since 1977, when it bought the rights to manufacture a regulator developed by a US engineering PhD called Tony Christianson.

The Pilot had a servo or "pilot"-operated second stage, Scubapro's only dalliance with that design. The US Navy Experimental Diving Unit considered it the best regulator for "extreme deep diving". It was incredibly expensive, but it began the distinctive low-diaphragm design we see in the latest D420.

The Second Stage

Is the underslung design just a nod to a bit of imaginative styling to make the D420 stand out? No, it's more than that. It's claimed to offer a mechanical advantage that reduces inhalation effort compared to a conventional hockey-puck second stage.

High-pressure air naturally flows towards areas of low pressure. When we swim in prone position, or ascend or descend head-up, our lungs are surrounded by water at a higher pressure than that acting on the diaphragm inside our mouth-held second stage.

To inhale we have to make up this difference, which contributes to "work of breathing". We have to suck harder. Water is around 800 times denser than air, so its weight is significant – that's why we can't breathe through long snorkels. We don't have the strength.

What the Pilot and ensuing Scubapro D type

second stages do is to locate the diaphragm a little lower than a regular puck design. By sitting against your chin, when you're horizontal or have your head raised it's nearer lung level. So it should be a really easy breathe, reckons Scubapro.

Otherwise, the D420 is a conventional downstream second-stage design. The inlet valve is pneumatically balanced. Compared to an unbalanced second stage, the spring needed to keep the valve closed when you aren't inhaling to prevent a freeflow can be weaker.

In unbalanced designs, the spring must be strong enough to hold back the incoming air from the first stage. Because the pressure of this air increases the deeper you dive in line with surrounding water pressure, the spring is stronger than it needs to be most of the time. To crack the valve to inhale, you must use lung effort to overcome the opposing force of the spring.

In the D420's balanced design, air pressure is used to help close the spring, which it surrounds.

This pressure automatically increases as you descend and decreases as you ascend, "balancing" the opposing air coming from your first stage that is trying to force the valve open. The effect is the same as having an adjustable-strength spring.

This means that the effort you must make to open the valve and get the air flowing is always minimal and consistent for easy breathing.

Cracking effort is non-adjustable, unlike with many of Scubapro's other models. I have owned a number of adjustable second stages and have never found a need to detune performance.

It's theoretically useful if your second stage starts to freeflow when you're facing into strong current, but I've faced off against those when I've been strung out on current-hooks in the Maldives or riding scooters, and it's never happened.

There is a dive/pre-dive control, a meaty lever atop the second-stage casing rather than the usual switch on the side. The purge is unusual too. It's really a rocker switch, and it's huge. Exhalation is through large moulded ports.

Scubapro D420 venturi dive/pre-dive switch.



The D420 hose can be led from left or right, giving you options for configuring for sidemount diving, for example.

Scubapro has eschewed the increasingly common flexi-hoses, so it's less convenient to coil up than some rivals.

The First Stage

Scubapro lets you mix and match second and first stages. Along with a budget unbalanced-piston model, there is a selection of balanced-diaphragm and piston designs.

With good-quality balanced-piston or diaphragm first-stage performance differences are subtle, and few divers will detect them.

I was supplied with the top of the line Mk25 EVO balanced-piston first stage.

Scubapro feels that a balanced-piston design is better for very deep diving, responding faster to the diver's inhalation than a diaphragm-valve does. It favours diaphragm engineering for extremely cold or heavily silted water.

As a balanced design, pressure drop in your cylinder as your dive progresses won't noticeably affect ease of breathing, even when near-empty.

The Mk25 EVO has five mp outlets, all with standard 3/8th fittings. Four are on a swivel collar; the fifth leads off the end of the first stage.

This port optimises air-flow, because air passing through the piston doesn't have to turn a corner as it does to exit the other ports.

Two 7/16th outlets are provided for pressure gauges or transmitters. There is no right way up or right way round with the Mk25 EVO, so you should be able to lay out your hoses exactly as you want. The option to run the D420 second stage from the left complements this.

As a conventional piston design, the spring and part of the piston is open to the water. This is why the piston design is more prone to problems from silt and icing than a sealed diaphragm model.

While silt can enter the Mk25 EVO's water chamber, icing is confronted by Scubapro's Extended Thermal Insulating System (XTIS). The first stage is also ribbed and sculpted to increase its surface area. These features draw cold away from the first-stage parts, such as the spring, into the warmer water and delay the onset of icing.

The D420 / Mk25 EVO combination is EN250A-rated. It meets the EU standard for a single diver breathing moderately hard at 50m, or two sharing at 30m, in water as cold as 4°C.

EN250A does not share whether a regulator scraped through or aced it with lots of performance in reserve, as I would expect this combo will have done.

In Use

When I started diving independent singles in the early 1990s to increase duration for photography, I ran both regs from the right.

I chose an D420 ancestor, the D350, as one of my regs, because the shape was so different to my puck second stage that I couldn't mistake one for the other. That reasoning still holds up.

For comfort, the D420 is excellent. It's light-weight, the exhaust T works as a chin-rest and the mouthpiece is barely noticeable.

The top-mounted pre-dive switch is very easy to use with gloves, as is the purge. The exhaust T does a good job of diverting bubbles away from your field of view in most attitudes.

Less impressive is performance when inverted. Why would you want to breathe from an upside-down reg? You wouldn't, but if it's dislodged or grabbed by an out-of-air diver it can happen by accident. In this situation, the underslung design means that the exhaust T might interfere with the mask-seal.

More importantly, the D420 won't fully clear upside-down, either by a forced exhalation or by purging. You or your buddy will inhale an air-and-water mix that could trigger, panic and/or a laryngospasm, closing off the throat and preventing breathing in or out.

The only solution is to remove the D420, put it in the right way up and clear it. Major problem? That's your call.

Octopus Test

In normal use the D420 is an easy breathe, smooth and responsive to light inhalations that pumps up the volume as soon as you need those harsh, fast breaths in a current. The real tell, of course, is the unbeloved **DIVER** deepwater octopus test.

Scubapro supplied me with a set that included an R195 octopus, a package it offers off the shelf. The R195, a budget puck-shaped second stage, is mechanically simple – a conventional downstream venturi-assisted second stage with dive/pre-dive switch. It isn't pneumatically balanced.

Like the D420, you can run the R195 hose from left or right, so you can stow your octopus to face towards you or your buddy without having to also commit to the side from which it feeds.

Gibraltar SAC officer and instructor Robert Sherriff, a technical diver who likes premium-quality kit, also services members' regulators and helped me with the octopus test.

The objective is to get a feel for how well a regulator breathes under the duress of two divers breathing heavily using two second stages fed from a single first stage.

Covid restrictions on the Rock meant that we could only estimate breathing rates, because we couldn't have a dive-team big enough to include a note-taker to monitor time and pressure fall.

Previous tests have indicated that we do hit the 500 litres per minute rate specified by EN250A. So we dived to 30m, grabbed a piece of wreck each and started finning as hard as we could to make our breathing rates soar.

As when sprinting, you feel your legs getting heavier and your breathing more laboured as drawing dense air into your lungs becomes more difficult. CO₂ levels also climb, because your

circulation can't remove it quickly enough.

My job is to determine if the regulator is getting harder to inhale and exhale from because its performance is becoming compromised under load, or if the discomfort is caused by my body.

Using the D420 second stage I received as much air as I could demand, and never felt that the regulator was dragging in any way. Premium engineering and performance go hand in hand.

However Robert, using the R195 octopus, was aware of a slight restriction to air flow whenever our inhalations coincided. He could get as much air as he needed, but an increase in resistance was noticeable.



This calls for some explanation. The R195 meets and presumably exceeds the EN250A specification. On a previous **DIVER** test one performed flawlessly during the sharing exercise with the Mk25 EVO.

So perhaps Robert and I simply achieved higher breathing rates than on the previous test.

Or, unlike on a machine test, which splits the demand to each second stage evenly, Robert demanded more than 250 lpm. I don't know.

Perhaps this underlines that EN250A criteria are based on moderate breathing, not the highest rates achievable. At 30m, a hard-working diver might pull 400 lpm. I have long argued that divers should not skip on safe seconds, any more than sky-divers should buy cheap reserve chutes.

I'd go up a level to a Scubapro puck-shaped pneumatically balanced second stage, such as the £185 C370, for my octopus.

Conclusion

The D420 second stage is an evolution of a long-standing design of second stage that is, I think, unique to Scubapro. It's also distinctive and has that aura of exclusivity.

The Mk25 EVO is a development of Scubapro's most famous first stage, which originated in 1968 and is renowned throughout its iterations for its reliability, ruggedness and ease of breathing.

The combination is formidable – a high-end performer that's an easy breathe, whether sipping air or gulping it. It has its quirks, but if you're smart enough to use it the right way up, it's an excellent regulator for serious diving. ■

SPECS

PRICE ▶▶ Mk25 EVO / D420 DIN or yoke £705, with R195 £840

FIRST STAGE ▶▶ Balanced piston

PORTS ▶▶ 2hp, 5mp

SECOND STAGES ▶▶ Downstream, left- or right-handed. MK24 EVO pneumatically balanced

WEIGHT ▶▶ 1.2kg, 1.6kg with octopus

CONTACT ▶▶ scubapro.com

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The latest kit to hit the dive shops



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The latest timepiece in the extensive Certina fleet, this stainless-steel timepiece is 300m-rated and features PVD bezel accents, Super-LumiNova markings and Certina's DS Double Security crown protection. The Swiss ETA automatic movement provides an 80hr power reserve. Prices start from £670.

>> certina.com

Sealife Reefmaster RM-4K Camera >>>>

Sealife reckons it has put easy, high-quality underwater stills and videography in every divers' hands with this new housed camera. It uses a Panasonic sensor providing 14mp stills and 4K video, and has a 140° super-wide-angle lens. The housing is rated to 40m. Camera with housing are priced at £299, and with a 2000F light set the total is £589.

>> sealife-cameras.com



Weefine WFS-05 Strobe <<<<

Weefine reckons that this strobe combines all the features required by the serious underwater photographer. The circular flash tube is said to offer soft, even lighting, with 120° coverage and a guide number of 24. Exposure is controlled automatically by your camera for ease of use, and there's a built-in 200-lumen modelling light with additional red night vision mode. The price is £490.

>> mikesdivecameras.com



Cressi Start BC >>>>

Budget-priced at £251, Cressi's Start BC weighs in at around 2.5kg, making it travel-friendly. It features a tough 1000-denier Cordura aircell and 13-20kg of lift, depending on size. Accessory management is catered for using the large zipped cargo pockets and dedicated octopus and pressure-gauge holders.

>> cressi.com

OrcaTorch SDO1 Mini Glow Tank Marker >>>>

This flashing product is meant to add extra safety in low-vis, overhead and night-time environments. Available with blue, white, green, red and orange LEDs, the SDO1 can be colour-coded to mark buddy-teams, shotlines and exit-points. A single AAA battery is said to run it for more than 100 hours and it's also claimed to be safe to 500m. It costs £19.

>> sea-sea.com





Suunto D5 Copper Computer ▲▲▲▲

New from Suunto is the £595 D5 Copper computer-watch. With air and three-mix nitrox operation and optional wireless gas-integration, this unit is claimed to be perfect for advanced recreational and entry-level technical divers. For helium mixes you can use its gauge settings, says Suunto, and there is a fully specced Freediving mode. A digital compass is built in. Designed to be used with the Suunto app, there is plenty of connectivity to allow you to host your dives on social media too.

▶▶ suunto.com

Seahorse Micro Protective Case ▶▶▶▶

There's so much we need around the dive-site with which water just doesn't mix. This 24 x 15 x 7cm case provides space for small cameras, phones, wallets, glasses and other knick-knacks. Waterproof to 3m, it's built from crush-resistant polycarbonate and comes with a pluck foam insert and combination lock. Available in red or black, it costs £30.

▶▶ cpspartnership.co.uk



Cressi Mini Palau Bag Jnr Snorkelling Set ▲▲▲▲

This set designed for younger snorkellers and scuba-divers has a retail price of £54. For that you should get peace and quiet while your offspring gets the benefit of an Estrella Jnr mask, Palau Kid fins and a Colorama snorkel with holdall. Also available in pink.

▶▶ cressi.com



IF WE ONLY KNEW WHERE TO LOOK...

Join enterprising Cornish diver Ben Dunstan as he uncovers more shipwreck treasures in home waters

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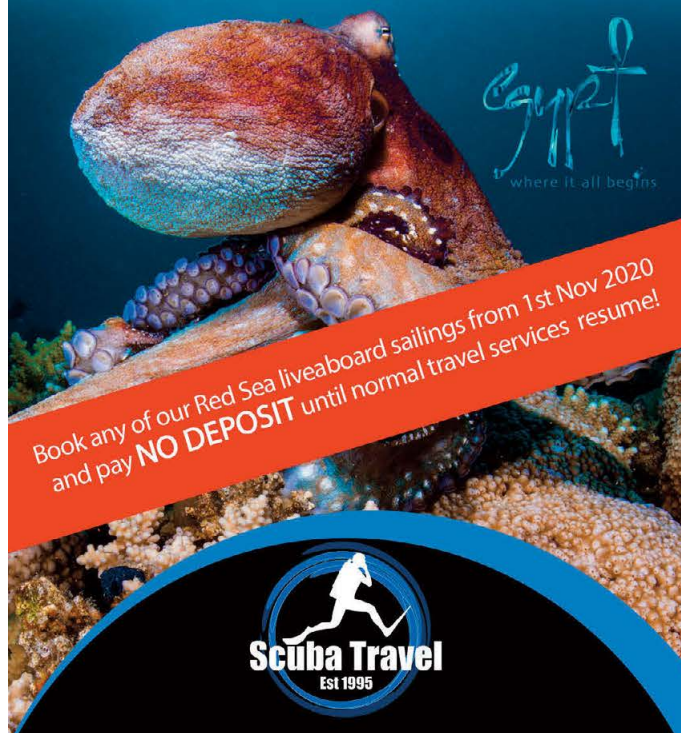
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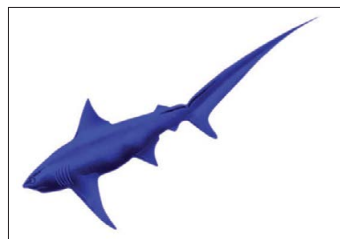


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Active and friendly BSAC club. All year diving in local lake. New and qualified divers of all agencies welcome. Own clubhouse with 7m RIB and compressor. For further information visit www.mksac.co.uk (64403)

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.fwright2@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.chelmsforddiveclub.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)

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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 our website: www.esacdivers.co.uk (65879)

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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)

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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)

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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: welshtflinty@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.nemodivertraining.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)

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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)

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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 diving officer@plymouthdivers.org.uk to join a dive. 72219)

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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: arannel23@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)

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Steining Scuba Club, West Sussex. All divers welcome. Steining 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.bathbubbleclub.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)

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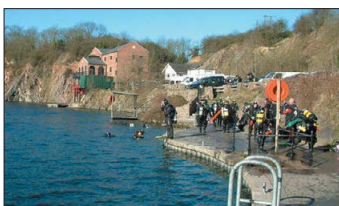


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Are you one of the many divers fascinated to watch cuttlefish behaviour? DR ALEXANDRA SCHNELL is too. This research fellow at Darwin College, Cambridge says she is happiest under water, but it was in the lab that she recently discovered that these surprising cephalopods still have big secrets to reveal. Her article first appeared in *The Conversation*

Clever cuttlefish show advanced self-control, like chimps & crows

WHEN I ENTER the marine laboratory in the morning, there's always a chance I'm about to get soaked. You see, our crankiest common cuttlefish, called Franklin, has recently taken to squirting a water jet at me from her tank.

I've decided it's her grumpy way of saying she doesn't want to participate in experiments, because Franklin never hoses me during my evening visits, which is when I'm only in the lab to give her dinner.

Cuttlefish are clever creatures, and squirting saltwater is not their only party trick. They're experts at camouflage, adjusting the colour and texture of their skin to match their environment.

Plus, cuttlefish possess a range of advanced cognitive abilities, including a sophisticated memory, to help them optimise their foraging behaviour and adapt to changing prey conditions.

But Franklin's selective squirting inspired me to test for another cognitive ability in cuttlefish: self-control, which might be what stops Franklin's impulse to drench me during my evening visits.

The ability to exert self-control varies across species. Rats, chickens and pigeons find it difficult to resist food and can delay gratification for only a handful of seconds. Primates and brainy birds, meanwhile, can tolerate delays of up to several minutes to obtain food of higher quality or quantity.

My team, including colleagues Nicky Clayton and Roger Hanlon, decided to test the self-control of cuttlefish by adapting a famous psychology experiment used to test toddlers' willpower. We found a significant capacity for self-control in cuttlefish, which is the first evidence of this cognitive ability in an invertebrate.

TO TEST OUR CUTTLEFISH, we adapted the Stanford marshmallow experiment, in which children are presented with a choice of taking an immediate reward – a single marshmallow – or waiting for the superior but delayed reward of two marshmallows.

In human children aged 3-5, about half cave in and take the first marshmallow, and half wait to receive both.

We presented cuttlefish with a similar dilemma. To test their willpower, they were presented with two desirable prey items, each contained within a separate



Rogelio, the cuttlefish that showed the greatest self-control.

Perspex chamber. One chamber was baited with a piece of king prawn, their second preference, which they could eat immediately. The other was baited with a tastier live grass shrimp, their first preference. They could eat it only if they waited and didn't eat the piece of prawn.

We tested a range of delays starting from 10sec and increasing the delay by increments of 10sec. All six cuttlefish waited for the better live shrimp and were able to tolerate delays up to 130 seconds, which is comparable to what we see in long-lived social species such as chimpanzees, crows and parrots.

Long-lived social species – species that live for many years and form social bonds – draw a number of obvious benefits from self-control. Temporarily denying their impulses could lead to a longer and better life. Resisting temptation so that they can help a social partner could strengthen social bonds that lead to reciprocated favours in the future.

The same rules don't apply for cuttlefish. They're not social, and they're short-lived. The average cuttlefish lifespan is just two years. So why would a cuttlefish

be a discerning eater, prepared to exert self-control?

Perhaps the answer lies in their eating habits. Cuttlefish stay motionless in camouflage for long periods to avoid detection from predators. This "sit-and-wait" behaviour is punctuated by brief bouts of foraging.

The need to optimise these foraging bouts might have influenced evolutionary expression of self-control in cuttlefish, because individuals who wait for better-quality prey could forage more efficiently at the same time as limiting their exposure to predators.

The concept of "less is sometimes more" is not something that all animals can appreciate. Those that have learned to avoid temptation in the present to enjoy a better outcome in the future – like humans and chimpanzees – perform better in tests of general intelligence, too.

WE DECIDED TO TEST the learning performance of our cuttlefish, an indicator of intelligence, in a separate reversal-learning task. We placed two markers that differed in colour in two random locations in their tank.

First, we had the cuttlefish associate one of the coloured markers with food, by rewarding them with food when they went to it. Then, we reversed the experiment.

That meant the cuttlefish had to associate the other coloured marker with an edible reward. Cuttlefish that were quicker at learning both the first association and the reversed association were also better at resisting temptation in our marine marshmallow test.

These findings are the first demonstration of a link between self-control and learning performance outside of the primate lineage.

Finding that cuttlefish are capable of some of the facets that are thought to be fundamental to the evolution of human intelligence is an extreme example of convergent evolution, where animals with completely different evolutionary histories possess the same cognitive feature.

Finding cognitive similarities between such distantly related animals is an important piece of the evolutionary puzzle. It could bring us one step closer to pinpointing the origins of intelligence.

And it gives me a newfound appreciation for Franklin, despite her insistence on drenching me each morning. █



Alex Schnell with cranky Franklin.

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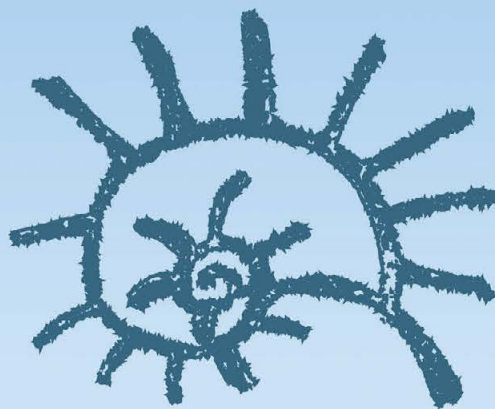


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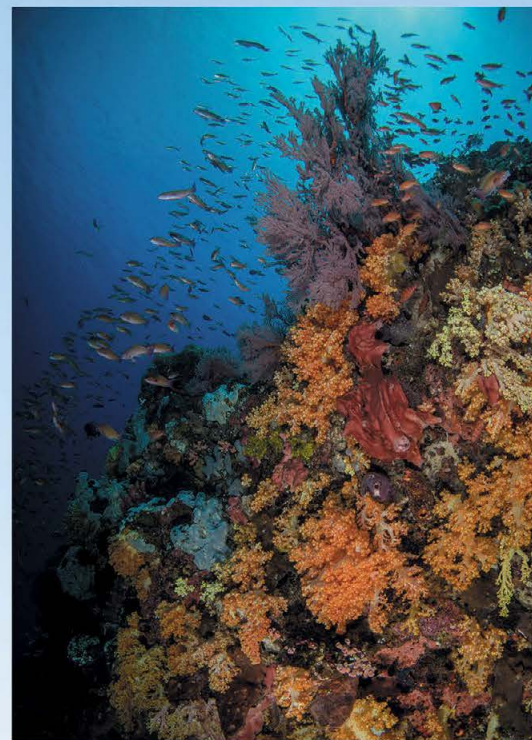


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