

# Underwater

# Photography

a web magazine

Issue 28

Jan/Feb 2006

Ikelite HDR HC-1  
Patima EOS 350D  
Backscatter 360ND  
Inon D-2000-W  
Fantasea FD-50

Ikelite 8" dome  
Olympus PT030  
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Little miracles  
Compact v DSLR

Nudis of Palau  
Manatees  
Shooting fish  
D100 retrospective  
DSLR TTL



Ikelite Digital SLR-DC Housings

# OFFER TTL FLASH

## CANON

EOS Digital Rebel (300D)  
EOS Digital Rebel XT (350D)  
EOS 10D  
EOS 20D

The Ikelite SLR-DC housing takes full advantage of the digital SLR cameras innovative features. The housing is injection molded of clear, lightweight polycarbonate for strength, visual access to the camera, LCD screens and camera controls. The housing provides controls for most camera functions. The versatility of this housing shows in the interchangeable port system which allows the use of a wide variety of lenses from macro to wide-angle to zoom. The rubber handles provide excellent grip and a quick release system for multiple strobe attachments to meet the needs of the most demanding professional.

## NIKON

D-50  
D-70  
D70s

## OLYMPUS

E-1  
E-300

The Ikelite SLR-DC housings have Conversion Circuitry built into the camera housing. When used with an Ikelite DS Substrobe; the Conversion Circuitry provides TTL flash exposure.

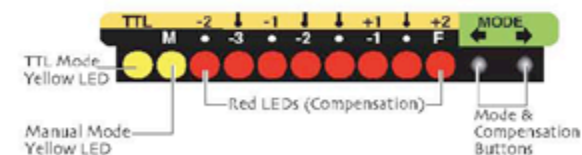
The Ikelite SLR-DC housings for Canon and Nikon also include a Flash Compensation Module which provides over and under-exposure compensation in the TTL mode.

At the push of a button, switch to Manual Exposure Mode which provides eight power settings in one-half stop increments. All exposure compensation is done with 2 buttons on the back of the housing, no accessing complicated camera menus.



Underwater Systems  
50 W 33rd Street  
Indianapolis, IN 46208  
317-923-4523

[www.ikelite.com](http://www.ikelite.com)



The Ikelite SLR-DC housings for Olympus have conversion circuitry and provide real Olympus TTL when used with Ikelite DS Substrobes but do not include the Flash Compensation Module.

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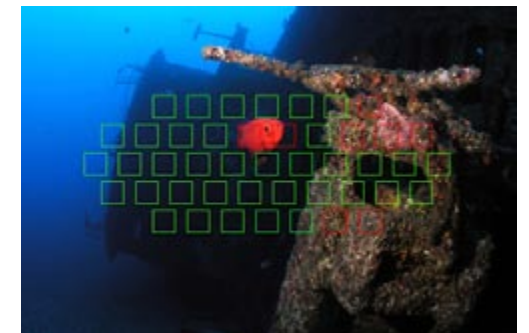


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# News, Travel & Events

## British Underwater Image Festival March 17-19th 2006

Underwater imaging is to enter a new golden age in Britain, with the introduction of a festival to celebrate the best in video and stills. The British Underwater Image Festival will run from 17 to 19 March next year at the Birmingham NEC as part of the Go Diving! show.

The competition has been designed for everybody from professional television documentary makers to first-time photographers. Plans are underway for the entries to be shown in an event that will mirror the Antibes underwater imaging festival in the South of France.

Organisers of the show are currently putting together a set of lavish prizes for the winners, which will include top-end liveboard trips, holidays and diving equipment. The best 50 prints will be displayed on the walls outside the dive theatre, while six finalists in the film categories will be shown throughout the show on Friday and Saturday.

'Britain used to have high-quality imaging festivals representing the work of divers, but there hasn't

been anything of note for a long time,' said DIVE editor Simon Rogerson. 'Now we are putting on something which could grow into a showcase for the incredible talent I know is out there. In France, they have the Antibes Festival, which is a red-letter day for anyone who makes pictures underwater. I believe the British Underwater Image Festival could grow into something just as important.'

Entries need to be submitted by 31st January!

[www.divemagazine.co.uk](http://www.divemagazine.co.uk)

## The Zale Parry Scholarship

The Academy of Underwater Arts and Sciences (AUAS) announced The Zale Parry Scholarship at the NOGI Awards Banquet in Las Vegas in October.

Zale Parry herself made the presentation of this new scholarship in her name that will award \$1500 per Recipient and a \$500 voucher towards travel expenses to the Scholarship Presentation Ceremony.

[www.auas-nogi.org](http://www.auas-nogi.org)

## Digital Shootout Palau

April 1-11, 2006

Join Dan Baldocchi, Eric Cheng, Berkley White, and Jim Watt



Improve your underwater photography skills at the 5th annual Digital Shootout. Learn the latest digital imaging techniques from some of the industry's top professionals while diving the legendary waters of Palau.

Berkley White, owner of Backscatter Underwater Video and Photo, Eric Cheng of Wepixel, professional underwater photographer Jim Watt, and Dan Baldocchi of Light & Motion will be your team of experts for week. Seminar topics include: Underwater photo techniques, Lighting and composition, Adobe Photoshop – multiple sessions, Workflow and file management, Printing, slide shows, and sharing on the web

In addition to instructional seminars the Digital Shootout ends with a photo contest that includes some major prizes for the best images taken during week. Prizes include photo gear, trips, software, and more.

We've created the perfect environment to learn new skills and apply them immediately while diving in paradise. Come join this fun and educational event.

For more information go to:

[www.thedigitalshootout.com](http://www.thedigitalshootout.com)

Space is limited so sign up today!

## Humpback Whales of the Silverbanks with Mauricio Handler April 1 - 8, 2006

During the winter months, primarily between January and April, the North Atlantic Humpback Whales migrate south to the Caribbean to mate and rear their young. One of the best places to observe these whales is around the shallow waters of the Silverbanks just 90 miles north of the Dominican Republic.

It is here that you can go to witness these magnificent animals during moments of courtship, tail and fin slapping, male rowdy behaviour and finding cooperative whales to have “soft in-water encounters” while snorkeling.

This is a non-scuba trip. All in-water encounters are done with mask fins and snorkel only (and your camera of course!). There is little free diving done, as the whales tend to come right up close!

While you wait and search for whales onboard the large day boats, you will have the opportunity to listen and digitally record their song. In addition you will be able to use land (dry) camera gear to obtain surface images while you wait to jump in with



© Dr Steve Jenkins

cooperative whales.

You will enjoy truly first-class luxury in Nekton's air-conditioned cabins with private baths and spectacular ocean views in every cabin.

The price is \$2495 per person /all inclusive except for crew gratuity.

Contact Mauricio directly with all detailed questions regarding this trip.

[mauricio@handlerphoto.com](mailto:mauricio@handlerphoto.com)

## Bunaken & Lembeh North Sulawesi



Dive Operator/Retailer.

Host of Asian Diver Magazine's Photo Shoot-Out  
(July/August 2005).

UK-owned dive operator in North Sulawesi.

Specialist in underwater photography. Three resident European photo pros offering photo seminars, rentals, courses & sales.

Bunaken National Park, winner of British Airways' Global First Prize for responsible tourism, offers world-class wall diving. The Lembeh Strait is arguably the most diverse and rich muck-diving destination on the planet.

Two-centre stays available to dive and photograph both unique environments. Quality resort accommodation available in both locations - Tasik Ria Resort in Manado, for diving Bunaken and Kungkungan Bay Resort in Lembeh.

Guaranteed small dive groups with knowledgeable local Divemasters who understand the needs of photographers. E6 processing, digital downloads, camera room on jetty with 220/110v charging.

North Sulawesi's only PADI 5 Star Gold Palm IDC Resort.

[www.eco-divers.com](http://www.eco-divers.com)

[info@eco-divers.com](mailto:info@eco-divers.com)

## snapmania online photo manager



The online photo manager snapmania reaches another milestone with new applications for digital pictures. Design stamps with a personalized portrait, enhance your Weblog with your best party photos or surprise your friends with a giant poster of your most beautiful vacation photo.

For USD 39.90 per year, with 2 GBytes of storage, or for USD 59.90 per year, with unlimited storage space, snapmania offers you triple storage redundancy, editing, management and comprehensive use of digital pictures on the Internet.

snapmania is the ultimate online photo manager. Securely saved photos, practical editing, clever organization, uncompromised useability. And all of this without any software installation on your computer as snapmania is online!

[www.snapmania.com](http://www.snapmania.com)



## Raja Ampat Archipelago 21st April - 6th May 2006 with Malcolm Hey

Unlike Captain Cook, you will arrive in this land from the steps of a scheduled aircraft at Sorong Airport, situated on a small island separated from the mainland of the Bird's Head peninsula, Papua's westernmost point. You will be met by the smiling and welcoming faces of Papua Diving staff; your dive bags and camera gear will be stowed aboard their speedboats and you head off in a northwesterly direction into the Raja Ampat archipelago some 40 miles out to sea and seemingly on the very rim of the Earth.

One and a half hours later, after cutting through a millpond sea splattered with picture postcard islands, you reach your destination - Kri Island, uninhabited and accessed only by boat. There can be few places in our oceans that have remained undiscovered by scuba divers yet this, to all but a few adventure travellers and liveaboard divers who have been lucky enough to call en passant, the Raja Ampat archipelago, has been left virtually unexplored.

[www.divequest.co.uk](http://www.divequest.co.uk)

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Bali, Komodo, Wakatobi,  
Manado, Kungkungan Bay

Palau, Yap, Truk  
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## Wetpixel Picture of the Week



Wetpixel is proud to announce the return to an interactive Picture of the Week contest, with public, member submissions and voting. As before, members may enter up to 2 images per week, and each weekly contest will enter a voting period for a week before the results are tallied and presented. It's the perfect opportunity to enter some of your hard-earned images into a friendly, public contest.

During testing of the system last week, their tireless staff uploaded some beautiful images for you to vote on. There is already a new POTW contest accepting entries, so ... go show off! The contest can be found at

<http://wetpixel.com/competition>

[www.uwpmag.com](http://www.uwpmag.com)

## Beneath the Sea's 30th March 24-26th 2006



In celebration of Beneath the Sea's 30th Anniversary Undersea Exposition and Dive Travel Show at New Jersey's Meadowlands Exposition Center in Secaucus, New Jersey we shall take as our theme: Legends of the Sea. If you are to tell Legends of the Sea, it is best to begin at the beginning, and the people who began it all way back in the early 1930's are Hans and Lotte Hass, the first people in the sea. Now in their eighties, they continue in their spirit of adventure and will voyage from their home in Vienna, Austria to be at Beneath the Sea and help celebrate our 30th Anniversary.

Discover for yourself what's going on Beneath the Sea at

[www.Beneaththesea.org](http://www.Beneaththesea.org)

## Fathoms Expedition to Similan Islands, Thailand 14-25th March 2006



Join Ethan Gordon, Fathoms' editor and experienced photojournalist, on an eleven-night expedition to Thailand aboard the areas premier live aboard, the Ocean Rover. Explore the Similan Islands where you'll dive into a world of pinnacles and giant underwater boulders with over 500 species of hard and soft corals and a vast array of marine life. Mantas, Ornate Ghost Pipe Fish, Leopard Sharks, nudibranchs, Whale Sharks, Harlequin Shrimp and Guitar Rays are just some of the creatures that you might encounter while exploring these exotic waters.

\$3750.00

Optional Land Excursion March 25-30, 2006 additional \$995.00 per person

[www.reefrainforest.com](http://www.reefrainforest.com)

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[www.ReefRainforest.com](http://www.ReefRainforest.com)

## Wakatobi & The Pelagian Savings



Sayang Holidays and Singapore Airlines have teamed up and chosen Wakatobi Resort and the Pelagian to be their exclusive dive destination partner. In celebrating this partnership, they are offering super saving packages for select dive holiday dates. The super savings package includes roundtrip airfare from San Francisco or Los Angeles, two nights at Bali, round-trip airfare to Wakatobi, all diving, meals and accommodations. If you've always wanted to dive the incredible reefs of Wakatobi but needed a good excuse, now is the time to take advantage of this special offer.

These deals are being offered for a limited time, for limited dates, and with limited availability. Once these spots are sold out, that's it! As these packages are priced at a significant savings, full payment is due at time of booking and there are no refunds.

Here are the trips available

for this super special rate (note that package rates include roundtrip airfare from San Francisco or LAX):

2006 Wakatobi Dates:

Trip #1a: March 10, 2006, return March 25, 2006. Package price \$3,459.

Trip #1b: 7 nights at Wakatobi Resort. March 20, 2006, return April 1, 2006. Package price \$2,759.

Trip #2: 7 nights at Wakatobi Resort. March 27, 2006, return April 8, 2006. Package price \$2,759.

2006 Pelagian Dates:

Cruise #2: 7 nights on the Pelagian Liveboard (Bali - Komodo - Bima). Depart March 1, 2006, return March 13, 2006. Package price \$2,959

Cruise #4: 10 nights on the Pelagian Liveboard (Bima - Komodo - Bima). Depart March 22, 2006, return April 6, 2006. Package price \$3,659

Cruise #9: 10 nights on the Pelagian Liveboard (Wakatobi - Wakatobi). Depart May 12, 2006, return May 27, 2006. Package price \$3,659

[www.wakatobi.com](http://www.wakatobi.com)

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# cameras

## UNDERWATER

[www.camerasunderwater.co.uk](http://www.camerasunderwater.co.uk)

+44 (0)1404 812277

# New products

## Ikelite Sony HDR HC-1/A1 video housing



The new Ikelite Sony HDR HC-1 video housing measures 6" wide, or 10.5" wide with the removable handle bar attached; 8" high including the removable base; and 11" deep including knobs and port. Weight above water is less than ten pounds.

Super Eye magnifier for the optical viewfinder is included, providing enhanced viewing while wearing a diving mask. External #9290.94 Side Mount Mirror is included to provide viewing of the color monitor through the clear housing. Reversing electronic circuitry shows correct left-to-right image.

All camera controls can be accessed with this housing, including both manual and auto focus. All touch screen menu functions are provided which allows white balance. The A1 allows assigning white balance to the right-front push button for which a control is provided.

The housing accepts external wide-angle lenses and NP-FM50, NP-FM70 or NP-QM71 optional batteries.

[www.ikelite.com](http://www.ikelite.com)

## Cameras Underwater Gift Voucher



Cameras Underwater offer a range of vouchers in denominations of £5.00, £10.00, £20.00, £50.00 and £100.00. They make ideal presents for underwater photographers to put towards any of the wide range of underwater photo equipment which Cameras Underwater stock.

Their Gift Vouchers may be redeemed both at their London showroom and at their Devon, mailorder address.

The voucher may, on payment of the difference, also be exchanged for goods of a higher value.

The voucher cannot be exchanged in full or in part for cash and is valid for 12 months from the date of issue.

[www.camerasunderwater.co.uk](http://www.camerasunderwater.co.uk)

## Patima EHC-350DX for Canon EOS 350D



Patima have announced the EHC-350DX, an underwater housing for the Canon EOS 350D.

The housing is compact and solid, manufactured from aluminium alloy and ergonomic placement of all important controls provides convenient and comfortable handling of the camera functions.

They produce a 60mm macro port and 160mm dome-port. They are both optical glass ports with anti-diffused reflection and anti-fog coating

A particular attraction of the housing is that it can connect with their strobe housing Patima 580EX, so that you can fully enjoy E-TTL flashing at underwater photography.

[www.patimahousing.com](http://www.patimahousing.com)

## Backscatter 360ND Filter System



Fisheye lenses such as the Nikon 16mm and Canon 15mm are the standard wide lenses used on cropped sensor cameras. Unfortunately, these lenses don't offer front filter threads and require use of the rear filter

mount. This is a problem when using various types of split neutral density filters both above and below water.

The 360ND is a custom solution that provides a 77mm filter thread in a geared rotating ring. The entire assembly is precision machined to press fit onto the lens. The geared collar can be rotated by hand on land or controlled by the focus knob in an underwater housing.

Current production models include: Nikon 16 / Subal D2x, Nikon 16 / Light & Motion D100

Price: \$300 (without filters)

[www.backscatter.com](http://www.backscatter.com)

## Nexus D70 Digital

*Anthix/Nexus since 1979*

*Nexus offers amazing features with compact size.*

- Glass Optics
- Dual Sync ports
- Aluminum housing
- Full controls
- 2 Extra external glands
- Adjustable handles

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See all the features for the Nikon D70 that Nexus has to offer.



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Macro Lens

.54x Wide Lens

## INON D-2000-W TTL



The New Inon D2000-W is an extremely compact strobe offering wide angle coverage and high power. It provides TTL automatic exposure via a reliable fibre optic cable with consumer and prosumer cameras. Manual exposure is provided for D - SLR's using a Sea and Sea Nikonos type sync cord.

Based on the original Inon 220 series, the new strobe combines the best features of the 220 range and the D-2000. When used with digital consumer and prosumer cameras, the camera's own lightmeter is used to ensure correct flash exposure. This takes advantage of the sophisticated metering built into modern cameras which are highly accurate. By using

TTL the problems of auto sensors are avoided such as having to remember to change apertures on both the camera and the gun or having to cheat the system when deviating from the "correct" film speed. It also prevents problems with the auto sensor not seeing the subject with some flash angles and consequently getting the exposure totally wrong.

Because even state of the art TTL can still be fooled by some subjects, the D2000-W has a built in exposure compensation feature. If TTL yields an exposure which is too light or too dark, you can easily adjust the exposure.

[www.oceanoptics.co.uk](http://www.oceanoptics.co.uk)

[www.uwpmag.com](http://www.uwpmag.com)

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Now you have your Olympus, Canon, or Sony digital housing, how do you hold onto it underwater? Ultralight makes a tray and handle to accomplish this.



Would you like to use a strobe or spotting light adapter with your new digital housing? Now you can, Ultralight makes arms and spotting light adapters to attach to the handle.



Maybe you would like to have two strobes, their tray makes into a double tray with the quick addition of two pieces.



Do you have Ikelite strobes and manual controllers and need to be able to attach those items to your housing. Ultralight makes adapters for the manual controllers that have a ball on the end so you can then add arms.

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## Fantasea FD-50 Nikon D-50 housing



The Fantasea FD-50 is a compact, lightweight, injection molded polycarbonate housing.

The FD-50's interchangeable port system accommodates a wide variety of SLR lenses, allowing photographers to capture the widest variety of superior underwater images. Operating depth is to 60 meters/200 ft.

[www.fantasea.com](http://www.fantasea.com)

## Multi-Chem Fast Charger

Light & Motions new charger is 50% faster than 2004 (1-3 hours charge times), auto selects between Nimh and Li-ion, 110/220v compatible and backwards compatible to year 2000 Light & Motion batteries.

[www.uwimaging.com](http://www.uwimaging.com)

## "Da Bigga Doma" 8" (4" radius) Dome Port for Ikelite SLR and dSLR housings



*Shown mounted on dSLR housing for Canon 20-D*

Ikelite will soon have available an all new dome port system utilizing a new 4" radius dome and interchangeable mounting stalk lengths.

Ikelite report that most lenses do not perform any better with a larger dome than with our exceptional 3" radius dome ports, but some of the new digital lenses do show an improvement and these are marked as recommended in the port charts.

Over-under photos may be easier with the larger radius dome.

[www.ikelite.com](http://www.ikelite.com)

## Sea & Sea HDR-HC1, HVR-A1J housing



Sea & Sea have announced their Sony digital HDR-HC1, HVR-A1J video housing.

It is depth rated to 60m / 200ft and weighs approx 4,800g / 168oz

Made from ABS resin it can take NP-FM50 and NP-QM71D batteries.

[www.seaandsea.com](http://www.seaandsea.com)

## UK Nikon D70 housing



UK Germany's Nikon D70 housing is coming soon!

190 mm x 165 mm x 120 mm, it weighs approx 2kg and is rated to 80 metres.

[www.uk-germany.com](http://www.uk-germany.com)

## Olympus PT-030 and PT-031



Olympus have announced their PT-030 underwater housing for SP-310 and SP-350 digital cameras and the PT-031 for the SP-700.

Waterproof to 40m, all camera functions can be controlled and there is a detachable LCD hood for LCD monitor on the PT-030.

[www.olympus.co.uk](http://www.olympus.co.uk)

# Sea Shepherd gives the whales a Christmas gift.

**No whale will be killed on Christmas Day.**

The Sea Shepherd Conservation Society flagship Farley Mowat intercepted the Japanese whaling fleet at 0400 Hours on Christmas day. Captain Paul Watson calculated a possible interception course by dropping out of the chase behind the Greenpeace ships Esperanza and Arctic Sunrise. He headed due west and caught the fleet as they attempted to head south towards Porpoise Bay.

At 0200 Hours they were spotted on radar. The Farley Mowat passed the Esperanza and headed to the Japanese factory ship, the Nisshin Maru, coming alongside.

The Nisshin sped up as the Farley Mowat came alongside. A few moments later the factory ship turned and came towards the Farley Mowat despite the fact that the Farley Mowat on the starboard side of the Nisshin Maru had the right of way.

Both ships were on a collision course and the Nisshin Maru's bow was plunging high out of the water as she came at full speed towards the Farley Mowat.

Captain Watson ordered a mooring line deployed behind the Farley Mowat. As soon as the Nisshin Maru saw the line they turned and backed off to avoid their prop being fouled.

At 0600 Hours the Nisshin Maru was heading west into heavy seas with the Farley Mowat on her tail. Captain Watson notified the Nisshin Maru that they were in violation of International law and that acting under the authority of the United Nations World Charter for Nature, he was ordering them to depart the Southern Oceans and return to Japan.

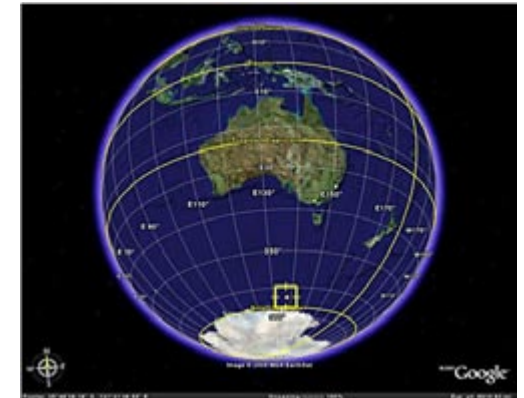
The Farley Mowat and the Esperanza are



chasing the Nisshin Maru in heavy weather. The chase is expected to last all day and chances are good that no whales will die in the Southern Ocean on Christmas Day.

Sea Shepherd Conservation Society welcomes your support. To learn how to support their conservation work, please visit their donation page.

[www.seashepherd.org/donate.html](http://www.seashepherd.org/donate.html)



*Location of the confrontation is highlighted in the yellow box. This year Farley Mowat has air power -- a helicopter and a flying inflatable boat.*



**The Japanese are violating the Southern Ocean Sanctuary. They are violating the International Whaling Commission (IWC) moratorium on commercial whaling. They are targeting endangered fin and humpback whales that are protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. (CITES). The Japanese are also in violation of the Australian laws protecting the Australian Antarctic Territorial waters.**

# Olympus E-300 digital SLR and housing

by Charles Hood

One of the issues when testing digital cameras is by the time I have had one for a sufficient number of months to make a detailed report they have been superseded. The E-300 from Olympus falls into this category and is now being phased out for the E-500.

However, there isn't yet an underwater housing for the E-500. Moreover, the E-300 is still available and the street price has dropped considerably so there are huge bargains to be had for what is now a relatively good value system. A quick search on Google revealed the camera and lens kit listed above being offered for under £400 and I suspect the housing will also attract similar offers.

The E-300 is Olympus's second stab at a digital SLR (single lens reflex) and the good news is that they made an underwater housing to go with it. To date Olympus have dominated the 'point and shoot' underwater market but have had no offering in the semi-professional range. Specification wise how does it compare to its competitors?

At eight million pixels it stacks up well against its rivals from Nikon and Canon in this price category. When it comes to the functions the E-300 follows the similar menu format found on their compact range so anyone who is familiar with these will get to grips with the SLR fairly quickly.

You get the usual array of far-too-many automatic features, however, I like many other underwater photographers choose to shoot in manual mode underwater which this camera allows you to do with ease. There is a built in light meter that is displayed on the screen at the back making it



easy to judge your exposure although I would have also preferred it to be displayed in the viewfinder as well.

The greatest advantage this camera has over the compact cameras is that the shutter delay is almost negligible. Thus when you press the shutter it takes the picture about 1/10s later compared to anything up to two seconds with a 'point and shoot'.

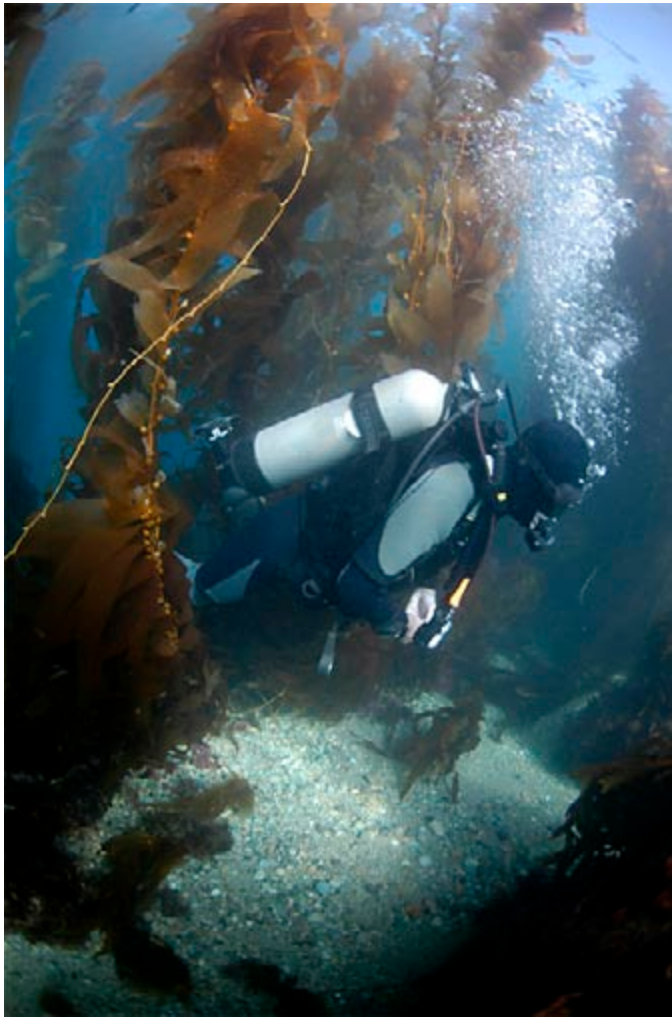
The bad news is that, after taking four shots, the buffer fills up and takes quite a while to clear. You may expect this when in RAW mode but I found it also happened when shooting in best jpeg.

Olympus manufactures a good range of lenses and I chose the 14-45mm zoom, which I thought would be a good all rounder for underwater use. I found it a bit slow at f3.5-f5.6 but considering its price tag its on par with similar offerings in the market. There is also a wider 11-22mm zoom, 8mm Fisheye and 50 macro lens available.

The housing is made from transparent polycarbonate similar in design to the consumer casings only bigger and with more controls. The



screw threaded port supplied is machined out of aluminium and is of superb quality. The only drawback is that it is flat rather than domed. This means, due to defraction (the bending of light that takes place underwater between the water/air interface)



like any other housing. Its compact design fits in a gloved hand well and all functions can be easily used thanks to the large buttons, knobs and levers.

What particularly impressed me was the double O ring seal on the back plate that gives that extra bit of security against water ingress.

One criticism is that the optical viewfinder is quite small and I guess you only get around 70% viewing at best so framing is a bit hit and miss. The LCD viewing screen is 1.8" , slightly smaller than the Nikon D70s.

Back in the studio I found that the camera requires you to load the supplied software onto your computer in order to download the images. Not wishing to have yet another camera manufacturers software cluttering up my hard drive I chose to use a card reader and imported them without any problems from the compact flash.

The image quality is good. Not outstanding but on a par with my previously owned Nikon D100. So considering the price tag you get an excellent image for your money.

Who is this system aimed at? I would say it fills an important gap in between the consumer

market and the semi professional market such as the Nikon D70 in an aluminium housing. The housing is rated to 60 metres. E-300 & 14-45mm lens kit £629.99 Housing £799.99 Port £249.99

**Charles Hood**

[charleshood@mac.com](mailto:charleshood@mac.com)

the 14-45mm becomes more like a 20-60mm. Or to put this in context similar to a 30-90mm lens when comparing it with 35mm film equivalent, which makes it nowhere near as attractive as I first thought.

Olympus have also chosen to use their own flash connection system rather than the industry standard five pin Nikonos style so my strobes wouldn't fit and I chose to shoot natural light.

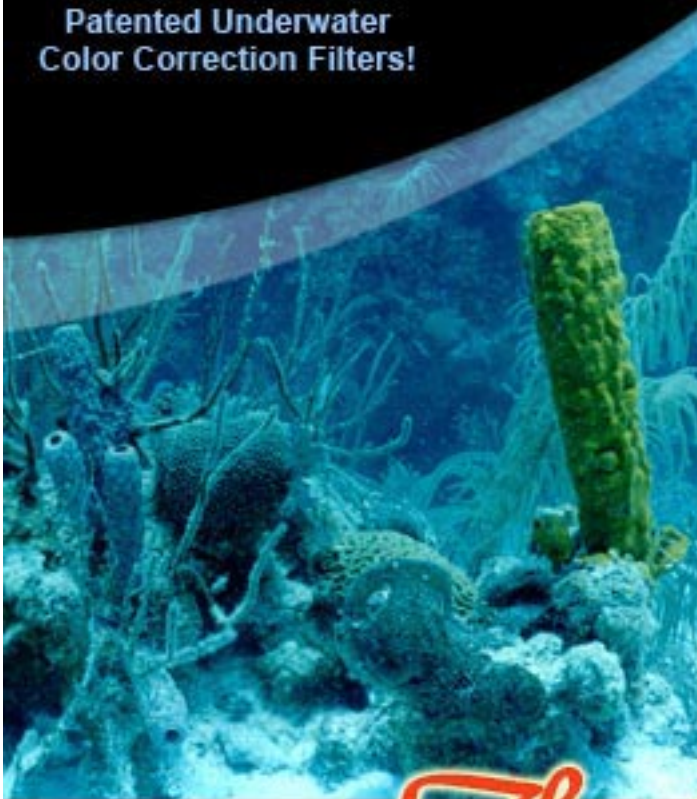
What's it like to use? In a nutshell very much



Charles is Senior Correspondent at Dive Magazine in the UK and author of 100 Best Dives in Cornwall.



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# Little miracles

by Peter Rowlands

I think it's fair to say that there has never been an easier time to start underwater photography and also that it has never been simpler to get good results straight away.

When I started, disposable flash bulbs were the order of the day, the Nikonos 15mm didn't exist and most of us made Perspex housings as there was very little commercially made equipment. We had to invent solutions as we went along and this made producing good shots very frustrating but, when it worked, very exhilarating.

Nowadays with the advent of compact digital cameras and, more importantly, their amazing plastic housings, underwater photography is not only easier but first timers can also get good images at the push of a button for very little money. The result is that more and more divers are taking cameras underwater and again, more importantly, are encouraged by the pictures they see so they keep taking pictures.

In the old days it was so difficult to get good shots that the drop out rate was extremely high but nowadays not only is the take up rate phenomenal, the drop out rate is far less.

Whilst a large part of this success is undoubtedly due to the capability of compact cameras I think that the plastic housings for them are nothing short of little miracles.

Traditionally underwater camera housings were custom built by individuals and small companies. They had little capital to invest and most were hand



*Depending on the number of controls, these housings are made up of over 200 individual parts!*

manufacturers like Olympus, Sony and Canon to name but a few we have seen large investments being made to mass produce plastic housings which not only work very well but end up being incredibly inexpensive.

When something is cheap we tend not to value it too much but I maintain that these plastic housings are nothing short of revolutionary and from my experience they are amazingly reliable and extremely robust.

From my associations with the underwater photo trade I have seen literally thousands of these housings being sold yet very, very few have caused problems or needed repair. As someone who has earned a significant part of my income from servicing underwater cameras, this has proved a very frustrating trend!

The design of these housings required new mechanical problems to be solved. Traditionally



*Excellent results can be achieved right out of the box. This shot was taken with the standard lens on an Olympus C40 in a PT-012 housing using the built-in flash with Auto exposure.*



*A balance has to be achieved to allow the user to push a spring loaded control yet not allow water pressure to do so as well. The solution is a combination of spring strength and O ring tension to achieve waterproof operational success.*

most camera functions were controlled by fixed O ring sealed shafts which rotated but the new compact cameras are covered in small push buttons, the controls for which not only need to be very accurately positioned but also designed to work under water pressure.

A balance had to be achieved to allow the user to push a spring loaded control but not allow water pressure to do so as well. The solution was a combination of spring strength and O ring tension to achieve waterproof operational success.

With modern computer controlled design and production there is a precision and consistency which was just not possible financially in the old days. The result is housings which

perform very well yet cost very little.

I recently got hold of an Olympus housing which had been written off due to damage to the small plastic lugs which retain the front port. This is a weak design despite all the computer controlled wizardry! I wanted to use some of the controls on a video housing I was making but, rather than just remove the controls I wanted, I decided to strip the housing completely to find out how many individual parts they were made of. This particular one had well over 200 individual parts!

I'd rather not think of how these housings are assembled. I very much doubt that machines are involved once the parts have been made, rather there are banks of low paid workers assembling these housings for us to enjoy the end product. That, I guess, is capitalism for you.

So the next time you dive with your compact digital camera, spare a thought for the time and investment which have gone into producing these little miracles.

We've never had it so good!

In the next issue of UwP we'll look at how these small inexpensive setups can produce amazing results.

**Peter Rowlands**

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# Compact or DSLR?

by Peter Rowlands

For anyone taking up digital photography for the first time there is a lot to take in but in terms of camera choice there is really only two – ‘compact’ or ‘DSLR’ (digital single lens reflex).

A compact digital camera, as the name implies, is usually small and light yet photographically speaking they are far from lightweight. The top end models boast 8 megapixels resolution which will satisfy the needs of most people in terms of output and print size and nearly all come with a useful zoom lens and flash built in. Even the lower megapixel models will produce excellent results and are much less expensive.

Compact cameras work best taking when ‘jpg’ pictures. These are compressed image files with negligible quality loss and can be processed quickly by the camera’s electronics. Some compacts let you shoot ‘RAW’ images where the data is left untouched but the image processing time is not really practical for most purposes.

Compact cameras have LCD screens at the rear for viewing images before you take them. This is a major

benefit and the same screen then displays the result once you have taken a shot.

Most compacts are designed to be used in ‘Auto’ mode but some of the top end ones allow manual adjustment of aperture and shutter speed.

Finally many compact camera manufacturers produce underwater housings for their cameras, most of which can be used down to 40 metres and include controls for most, if not all, of the camera’s functions. In addition, for what you are getting, the cost of them is extremely reasonable.

There are a wide range of accessories for these housings including close up and wide angle lenses as well as external flashguns (strobes) and colour correcting filters so there is almost no limit to the subjects you can capture.

Bearing in mind all of the above, why would anyone want to spend more on a DSLR? Well the main reason is that compact cameras have a significant shutter delay. This is the time from when you press the shutter to when the picture is taken. This can be as much as 2 seconds but newer



*£5000 or £500? Is it worth it?*

models are improving. During this time the camera focuses and adjusts exposure before finally recording the image.

For many subjects this is not a major drawback but fast moving fish, for example, would be really hit and miss affair!

Many underwater photographers progress from a compact to a DSLR camera purely to eliminate shutter delay but this comes at a significant cost increase. However for most people, eliminating the shutter delay is well worth the extra cost.

DSLR cameras use conventional prism viewfinders to view the image then, when the shutter is pressed, a mirror flips up and exposes the CCD chip to the light. The resulting image is then displayed on an LCD screen at



the back of the camera.

DSLR cameras consist of a body and a lens so there is extra expense buying the lens or lenses which suit your subject requirements. Having said that there is virtually no subject you cannot shoot successfully, finances permitted.

As you would expect from a more expensive camera, a DSLR processes jpg images much quicker, almost instantaneously in fact, and can capture several sequential images in a



*One shot was taken with a compact camera and accessories costing less than £1000 whereas the other was taken with a DSLR system costing nearly £4000. Can you tell which one? The answer is bottom right.*

motordrive burst. Finally they allow you to shoot 'RAW' images which, for most serious shooters, is the preferred format. This unaltered datafile can be manipulated later to an amazing degree to correct colour balance and exposure as well as sharpness to a certain extent.

In terms of housings they are much more expensive and tend to only be available for Nikon and Canon DSLR cameras. I suspect that these two manufacturers have the lions share of the land camera market so maybe this isn't much of a limitation.

Ports are available to house almost any lens so you have a system which a truly capable.

Unlike compacts, DSLR cameras do not have useable built-in flashes as, if they have one, the housing renders it unuseable. Instead they have sockets to connect external flashguns but most amphibious flashguns can only be used in manual exposure mode so you have to set the lens aperture to suit the output of the flashgun. Despite getting instant results on your LCD screen from which you can make any necessary adjustments



some underwater photographers still rely on TTL flash automation and this can only be achieved by housings a manufacturers flashgun or using a Fuji S2 which, to my knowledge, is/was the only DSLR to offer TTL automation with amphibious, Nikonos compatible flashguns.

Whether you choose manual or TTL flashguns there is the additional expense of sync cords and mounting arms.

Which camera type you choose is up to you but both are capable of taking excellent pictures and, unlike conventional film cameras, once you

have bought one there are virtually no running costs so you can take as many shots as you like and not worry about the finances anymore!

**Peter Rowlands**

[peter@uwpmag.com](mailto:peter@uwpmag.com)



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# Nudibranchs of Palau

by Ethan A. Daniels

Over the past decade the Palau archipelago has become one of the most famous destinations on the planet for serious divers. There are few locations on earth that can compare to the overall marine biodiversity found within such a confined area, all within a 45-55 minute boat ride from Koror, the nation's capital. This group of islands, uplifted during volcanic activity caused by tectonic plate shifts, is over 30 million years old. Subsequently, coral reefs have been growing ever since the uplift, creating a myriad of habitats for marine life.

Divers arrive in Palau looking forward to the reliable and exhilarating shark encounters, schooling fishes, manta rays, and World War II wrecks. Few people visit the islands anticipating the amount of invertebrate life that proliferates throughout the mangroves, seagrass beds, and coral reefs surrounding the islands. Whatever people's underwater interests may include, Palau accommodates them.

One of the most conspicuous groups of marine invertebrates are the nudibranchs, naked-gill sea slugs. Nudibranchs fall within the Phylum Mollusca, Class Gastropoda, subclass Opisthobranchia, order Nudibranchia. The majority of people who are attracted to these colorful sea slugs make their way to areas in the Philippines, Malaysia, or Indonesia where thousands of species of opisthobranchs are known to be found. This geographic region seems to be the bio-geographic



*Glossodoris atromarginata* is found frequently on wrecks within the inner lagoon.

center for sea slug diversity, as well as most marine fauna. Geographically, Palau is in an excellent spot to collect marine organisms from diverse areas, located about 600 miles northeast of Irian Jaya, and 600 miles east of the Philippines. The reefs and inner lagoon of Palau, better known for large fishes, are home to a wide variety of nudibranchs and other mollusks that can readily be found by visiting the right spots and having a keen eye.

Nudibranchs are considered by many knowledgeable divers to be the most attractive and fascinating of invertebrates due to their strange, vibrant colors and life histories. Scientists have just begun to comprehend the most basic pieces of nudibranch life histories. The wonderful aspect for divers who become interested in these tiny predatory jewels is that they have produced endless variations of behaviors, morphologies, and colors.

New species are found, photographed, and described from all over the world's oceans each year. New records of nudibranch species in Palau should be anticipated as more recreational divers



*H. bullocki* a species with variable colors, tends to be translucent white and is uncommon in Palau's waters.



*Notodoris minor* is one of the larger and unmistakable species of nudibranchs easily spotted on Palau's reefs.

and researchers seek them out

Through millions of years of natural selection, nudibranchs have reduced their protective calcium carbonate shells, allowing greater mobility. Over time, rare, beneficial mutations have allowed nudibranchs to invade and succeed in narrow niches



*Ardeadoris egretta* is another fairly common chromodorid whose geographical distribution ranges from the Arabian Sea to Palau.



*Chromodoris coi* can regularly be seen along the walls and current-swept channels of the outer reefs.



*Miamira sp* is one of the most seldomly encountered nudibranchs in the archipelago.

to which their ancestors, shelled gastropods, were unsuited. Instead of the protection provided by a hard shell these slugs have opted for other defensive weapons. Potential predators are faced with various armaments including noxious chemicals, acids, or stinging cells. Nudibranchs advertise their

defensive wares to possible predators with a wide array of magnificent colors and patterns arranged on their bodies. Some species without such obvious warning colorations may burrow into the soft bottom, emerging only at night to feed. Nearly all nudibranchs are specialized carnivores that have one, or a small group of prey species. They locate prey using their rhinophores, antennae located on their head, which detect chemical compounds emitted by other organisms. They may also track down mates, or potential prey, by following the mucus trails left behind by the animals as they slime their way across the reef.

Locomotion is accomplished by transversal contraction waves traveling through the nudibranch's foot. These contraction waves propel the slug forward on a mucous film that is produced by a gland near the head. This would be like a mammal's nose continuously dripping fluid in order that the animal could move around its environment. Some nudibranchs, like the Spanish Dancer, *Hexabranchus sanguineus*, are powerful enough to

actually swim away when disturbed. This species is relatively rare in Palau, but can be found at night crawling on the drop-offs or coral gardens along the barrier reef.

Reproduction in nudibranchs is an entertaining aspect of their life histories that divers may have the opportunity to witness on any given day. All sea slugs are either simultaneous or sequential hermaphrodites and tend to reproduce all year round in the warm tropical waters of Palau. They copulate in pairs, arranging themselves right side to right side, each individual internally fertilizing the other's eggs with sperm. Once fertilized, eggs are laid by each individual, usually, in a tight ring expanding counter-clockwise. In many cases the eggs may look like brilliant red, or yellow flowers. These brightly colored spirals are easily spotted by divers due to their prominence on the reef. Certain species lay eggs in gelatinous masses, e.g. *Pteraeolia ianthina*.

Eggs are usually found near the food source of the adult and incubate there for various time periods, depending upon the species of nudibranch and/or water temperature. The veliger larvae that hatch from the eggs drift and swim with ocean and local currents for some time, eventually settling on or near a food source, i.e. sponge or hydroid colony. Larvae then metamorphose into juvenile nudibranchs, looking much like the adults. Unfortunately for them, nudibranchs have somewhat short life spans on average. The majority of species live for less than one year and many only survive a few months or weeks. The populations of certain species may vary greatly due to the natural life cycles of their prey.

There are two important suborders of nudibranchs found in Palau, Doridacea, the largest



*Nudibranch eggs on Polycarp sp ascidian*

group, and Aeolidacea. Two other suborders are present but much less common. The Dorids are the most common and recognizable nudibranchs found in Palau. Most have a pair of chemosensory rhinophores on their head and gills on their back. This group contains the Chromodoridae, the largest family of nudibranchs in the Indo-Pacific region. Chromodoris species feed on sponges and transfer toxic chemicals produced by their prey to glands in their tegument (along the dorsal side) making them a rather noxious meal for predators. The chromodorids contend with a few other families for the brightest and most aesthetically pleasing to human eyes. While in Palau, divers most commonly find *Ardeadoris egretta*, *Risbecia tyroni*, *Glossodoris atomarginata*, *G. cincta*, *Hypselodoris bullocki*, *H. obscura*, *Chromodoris coi*, *C. kuniei*, *C. fidelis*, *C. verrieri*, *C. leopardus*, and *C. geometrica* and a few other species in all types of habitats, including walls and dropoffs, coral gardens, sand and rubble bottoms, and wrecks.

The most common family of nudibranchs found throughout Palau is Phyllidiidae. There are a



*Hypselodoris obscura* is another rarity, photographed at 35m on the silty bottom of the inner lagoon.

handful of species that can be seen on almost every reef habitat. These sponge predators are easily identified as a group by the absence of gills on their backs. The mantle encloses the gills making them invisible to divers. This unique family of slugs lack teeth and must secrete digestive enzymes onto their prey before they consume them. Rarely are Phyllidia species pointed out to divers because they are so frequently found. Several of the species are very similar morphologically and hard to tell apart. *Phyllidia varicose*, *P. elegans*, *P. tula*, *Phyllidiella pustulosa*, *Phyllidiopsis annae*, *P. fissuratus*, *P. kremfi*, *P. striata*, and *Reticulidia fungia* are all easily located. Few species grow larger than five or six centimeters.

The third most common family found in Palau is the Notodorididae. This group contains Notodoris species (*N. minor*, *N. gardineri*, and an undescribed species) that feed on sponges and somewhat resemble mutated sponges themselves. These species grow fairly large for nudibranchs, greater than 10 cm, and have three appendages



*Phidiana indica* can usually be found on wrecks or reefs within Palau's Rock Islands.

protecting their fragile gills. Their bodies are clay-like and moderately colorful. The Notodorids found along the drop-offs of the barrier reef lay bright yellow egg masses that can be seen from a long way off. The nudibranchs that laid the eggs are often found nearby. Notodoris species have been found at all recreational dive depths where their preferred food source lives, from three to over 200 feet.

The suborder Aeolidacea is made up of nudibranchs that have narrow bodies with pairs of oral tentacles and chemosensory rhinophores found on their heads. It is easy for divers to identify this group due to the cerata, tube-like projections along the nudibranchs backs. The cerata are digestive gland extensions with extremely thin walls to allow the exchange of gases with the surrounding waters. The cerata therefore act as the gills. The aeolids feed on cnidarians: soft and hard corals, hydroids, and anemones. Aeolids have an amazing way in which they defend themselves. While feeding on cnidarians, they will digest the prey tissue that they consume except for the juvenile stinging



*Chromodoris kuniei* is one of the most prolific chromodorids in the Western Pacific and makes an excellent photographic subject.

cells, called nematocysts, which all cnidarians possess. The nematocysts are moved through the digestive system to the cerata and arranged within the nudibranchs tissues to be used for their own defense. Two of the more common families are the Flabellinidae, containing the species *Flabellina exoptata*, and Facelinidae, containing the species *Pteraeolidia ianthina*). These nudibranchs can be found along most walls and drop-offs. *Flabellina exoptata* is a tiny pink nudibranch, about three cm long, with yellow-tipped cerata that lives on walls and dropoffs. *Pteraeolidia ianthina* looks like a small pipe-cleaner and is especially common in the channels close to the main inhabited islands of Palau.

Several of the families and many species found throughout Palau's limestone "Rock Islands" and inner lagoon, patch reefs and barrier reef have not been mentioned because they are not easily found. Divers who are interested in finding the less common species of nudibranchs must find



*Chromodoris leopardus* has exquisite coloration and is found infrequently among various Palauan dive sites.

their food source and then have patience and sharp eyes. Night diving is one way in which to increase chances of finding these animals. Many species are nocturnal predators.

Closely related species are extremely difficult to distinguish merely by looking at morphological, or physical features. Comparing their genetic structures (DNA sequences) is the best way nudibranchs can be divided or grouped together into families, genus, and species. The taxonomy of nudibranchs is in desperate need of revision. The future certainly holds more discoveries and surprises for scientists and laymen alike.

Not only should divers appreciate locating and observing these unique creatures in their natural habitats, but also their fascinating life histories and evolutionary history. Looking at nudibranch morphologies, it is easy to wonder about the mutations and natural selection that has taken place over millions of years. How and why did they evolve into the forms that divers observe



*Flabellina exoptata* a common aeolid throughout the Indo-Pacific, is unmistakable with its purple coloration and yellow-tipped cerata.

today? What role do they play within their small, but diverse marine communities, and how have they been so successful over time? Divers should also contemplate the larger picture, beyond the aesthetic beauty of nudibranchs, and think about the range

of environments in which they live and how to preserve them. Ecologists almost completely agree now that the best way in which to save a particular species is by preserving their habitat. Who knows what the effects of losing these incredible species would be as their habitats are degraded.

We are living in an era of astounding biological diversity, yet extinction is also a common event in this age. This may be due to the combination of several factors, such as changing climatic conditions, habitat diversity and destruction, pollution, and chance (to name just a few). We, as divers and explorers of the marine world, should not only admire and be in awe of the large conspicuous creatures that inhabit the Earth's oceans, but also the smaller, less prominent, but just as exquisite, species that play important roles within their ecological communities.

## Shooting Nudis

Capturing an outstanding nudibranch image on film or flashcard is more difficult than it may seem. The trickiest part is actually finding them among all of the other bright and cryptic reef organisms. Though they may not move as fast as a shark or billfish, most nudibranchs are constantly on the prowl for food and keep chugging along in that pursuit. At least most of them have such vibrant coloration that it's hard to lose them while framing and focusing, unlike a pygmy seahorse. After setting up and shooting one shot, it's likely you'll have to adjust your position to get the right angle and background. Be patient and careful with your fins and body position, there's absolutely no need to



*Reticulidia fungia*, within the Phyllidiidae family, has a unique but variable pattern and is a rare find amongst the diverse reefs of Palau.

lie on the bottom to shoot any subject! Obviously, buoyancy control is key to becoming not only a proficient nudibranch shooter but an all round good diver as well.

Regarding equipment, you'll need a decent macro setup. There's little point in using a lens wider than a 60mm. I still use an old, beat-up Nikon N90 with a 105 mm lens, housed in an Aquatica 90 with two Sea & Sea sub-30 strobes on short TLC arms which are easy to move around on ball joints. I always use manual focus because the body of the nudibranch may be at an angle where it will be slightly out of focus. Be sure to focus on the nudibranch's rhinophores! Even though the pros use housed cameras I still see great shots coming from extension tubes and framers once in a blue moon. It just depends on if the photographer pays attention to the limitations of his or her setup.

The technical aspects of photographing opisthobranchs is fairly straight forward. Personally, I keep it simple, usually shooting on manual at



*Nembrotha cristata* has a black body and green gills and pustules. This species is often confused with its close relative, *N. kuaryana* which may have a bit of red around its margins.

1/60th at f/16, 22, or 32 depending how close I am to the subject and what film is in the camera. I'm still using Fuji Velvia 50 ASA while shooting underwater these days. I haven't broken down and picked up a housing for my Canon 10D quite yet. The strobes are kept about 2 feet from the subject and are moved around quite a bit depending on how I want to light the scene. As with all images, the background is extremely important. This is an aspect of photography I can't stress enough. Pay attention to what the organism is on and what's behind it! The background can make or break an image even if everything else is technically correct, in focus and well lit.

**Ethan A. Daniels**

[daniels\\_ethan@hotmail.com](mailto:daniels_ethan@hotmail.com)



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# Gentle giants

by Gregory Sweeney

It's a wintry, bone-chilling day just before dawn; our warm breath is as thick as the early morning fog on the cold air. We quietly slip into our wetsuits, don our masks and fins. Just then two large snouts appear from beneath the water surface and quickly disappear. Cautiously we abandon our small rental boat and enter the water with camera in hand.

Below the surface, we are surrounded by gigantic creatures as big as 3 meters (10 ft.) and weighing 454 to 1,600 kg (about 1,000 to 3,500 lbs). Cautious curiosity brings these giants close to us. I slowly reach out my hand, touching their thick, rough skin noticing the flat paddle-shaped tail and small black eyes. Is this the famous legends told by sailors reporting seeing half-fish and half woman resting on rocks and cruising the river ways?

In reality those sailors probably saw manatees. Manatees are forever linked to the Greek myth of women who lure sailors by using the name Sirenia in the Latin name for one of the species.



*A playful manatee comes in to greet us with a characteristically slow pass.*

The West Indian manatee has two subspecies; the Florida manatee (*Trichechus manatus latirostris*) and the Antillean manatee which can be found throughout the Caribbean. There are two other manatee species: one along the west coast of Africa and another in the Amazon. There is also a close relative called the dugong. It is found in the Indian and Pacific oceans. The Amazonian manatee can only live in freshwater lakes and rivers, has no fingernails and its belly

has white and pink patches. The West Indian and African manatee have three or four fingernails on each flipper. They can live in fresh or salt water. The dugongs are dark-grey, smooth-skinned, have a split flipper-like tail, and are about half the size of the Florida manatee.

Manatees are tactile. When together they greet one another by pressing their snouts together, touching tail, or giving each other friendly bumps. They also



*Manatee mail delivered rain or shine.*

communicate by sound: a whistle, grunts, or chirps. Manatees have transparent eyelids to protect their eyeballs from saltwater. They can grow new teeth when the old ones become worn.

For a close-up encounter with this endearing, endangered gentle giant, the sleepy west central Florida town of Crystal River is one of the best places in the world to photograph manatees. The water visibility can be as clear as gin in the warm springs





*Florida automobile owners paid \$20 extra for a “Save the Manatee” license plate. Some 95,000 were sold in 2002 with proceeds going toward marine research.*

*Tony gets comfortable photographing manatees in the crystal clear springs.*



*We had the honor to work with fellow photographers and our friends Tony and Emiko Wu who traveled half way around the world from Singapore to photograph and be enchanted with these peaceful gentle giants.*

By 1768 they were rendered extinct by hunters who prized its meat and skin.

The current fight to save manatees has shifted from hunting to boating. Since manatees swim near the surface and do not always react very quickly, they often fail to get out of harms way caused by an on-coming boat. Boat propellers slice their hides often with fatal consequences. Boat hulls and their keels crack manatee skulls and break their ribs. Manatee lungs are unique: they are flattened and elongated, extending horizontally along their back. The lungs help provide buoyancy in the right place to float horizontally. Because of this position, lungs can easily be

punctured by ribs broken during a boat collision.

In 2003 there were 380 known manatee deaths. One of the known leading causes has been collision with watercraft. These collisions have resulted in 73 deaths. Other causes of death are cold stress, natural (red tide), and perinatal. A natural threat to manatees called red tide is a water bacterium that turns the water red and can paralyze manatees preventing them from surfacing for air. Manatees have a thin layer of fat (blubber) and since they move very slowly they can become very hypothermic at water temperatures below 20°C (68°F) which could lead to shock and then death.

Since manatees are nomadic with no permanent home and are not territorial, nobody knows the exact manatee population in Florida. Aerial surveys are conducted in winter to get an approximation of their population. In 2004, the aerial survey counted 2,568 manatees. Manatees are protected under the federal Endangered Species Act and this makes killing a listed animal a crime. Recently there has been a fierce fight over the manatees. Advocates of the manatee say the creatures are barely hold their own and may be in peril while developers, anglers, and many boaters say that the population has rebounded and should be taken off the Endangered Species List. The dispute

concerns new regulations, intended to ensure the species survival, further limits not only development but also boater’s access to certain water inhabited by manatees.

French filmmaker Jacques-Yves Cousteau read a story in September 1969 issue of National Geographic Magazine by Daniel Hartman called “Mermaids in Peril”. Cousteau produced a 1972 television documentary that heightened public awareness about the manatees. Then



©Gregory Sweeney

*A gregarious, acrobatic manatee going for the barrel-roll*

*Severe propeller damage to manatee tails.*



©Gregory Sweeney

in 1981 tropical troubadour Jimmy Buffett and then Florida governor Bob Graham met backstage at one of Buffett's concerts and decided to help start Save the Manatee Club. Today it has 41,000 members and Buffett still serves as co-chairman.

Archaeologists have inferred from the fossil records that manatees have been around the state of Florida for 44 million years. They are distant cousins of the elephants. With a slow reproduction rate at best, the female manatees give birth every 3 to 5 years: usually to one calf.


With a low reproductive rate, loss of habitat, and heated public discussion, these are critical times for

the manatee; a shy, chubby, peaceful, marine mammal, whose only defense is flight. The future of these gentle giants rest entirely in our hands

**Gregory Sweeney**

[www.gregorysweeney.com](http://www.gregorysweeney.com)






**Manatees: The Gentle Giants**  
 Photographs by Gregory Sweeney Text by Karen Keberle

Size: 20cm x 20cm , 72 pages, hardback with a full color dust jacket

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ISBN# 0-9772873-0-0

  
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# Shooting Fish

By Alexander Mustard

To start by stating the obvious: fish are certainly one of the most popular subjects for underwater pictures. Indeed, bringing back pix of the pretty fish that we see is one of the main reasons that many of us took up underwater photography in the first place. That said, shooting fish in the ocean is not as easy as the proverbial barrel. Fish are always on the move, darting in and out of focus, waiting for the exact moment we press the shutter to turn away and leave us snapping at their tails. Underwater fish can be everywhere, but good images can remain elusive. In this article I would like to discuss the kit, techniques and lighting of fish photography and also review some of the different ways of shooting fish.

Unfortunately not all underwater cameras are created equal when it comes to fish photography, and choosing the right equipment can make a big difference to your images. The best choice for fish photography are SLRs, either digital or film. SLRs have lighting-fast reactions; they can focus quickly and take pictures without delay. They also allow accurate framing of the subject, giving them a considerable advantage over viewfinder cameras such as the Nikonos and Motormarine.

Digital compacts offer accurate framing, but are held back by their shutter lag, although I should note that this delay between pressing the shutter and the picture being recorded has been reduced significantly on the latest models. The key to successful fish photography with compacts is subject selection. Compacts do a great job on



*Fish schools look best when the whole school is contained within the frame. Nikon D2X + 17-35mm @ 17mm. Subal housing. F6.3 @ 1/60<sup>th</sup>. 2x Subtronic Alphas.*

stationary species (e.g. frogfish), slow moving species (e.g. lionfish) and site-attached species (e.g. clownfish). But if we try and shoot fast swimming species we will find it much more frustrating.

I am a great believer in autofocus and strongly recommend SLRs with excellent AF for fish photography. When choosing an SLR it is important to check its AF performance not only in bright

sunny conditions on land, but also in low light and in low contrast conditions. The other factor to consider with AF is not to treat it as an on off switch, that we can flick and everything will be in focus. Instead it is important to help the AF, by placing the AF sensor over an area of contrast on the subject.

It is also well worth investigating the various



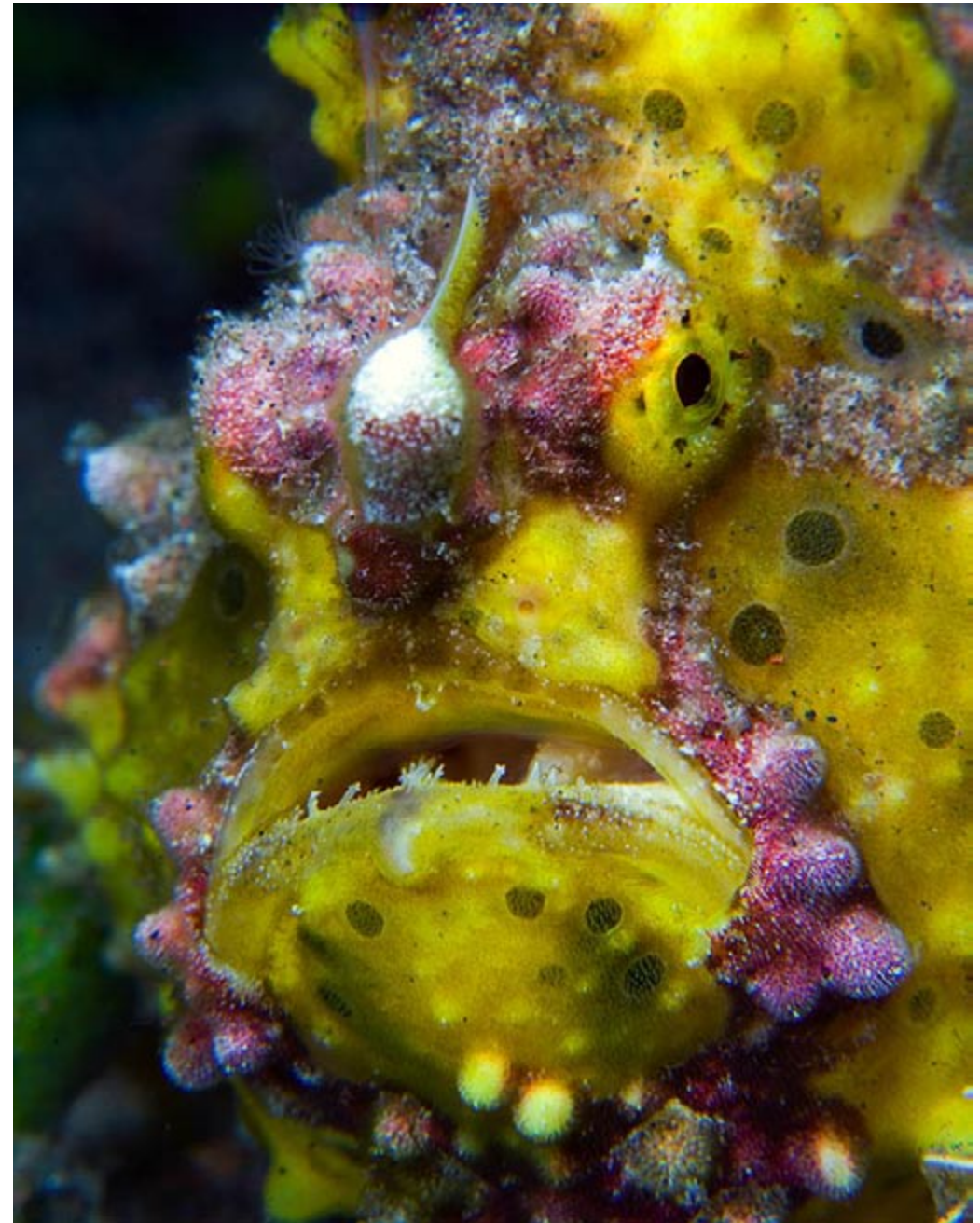
*Behaviour adds extra interest to fish pictures. Here a larger male French Angelfish, faded in colour during courtship, nuzzles a female during their long spawning rise. Nikon D2X + 105mm. Subal housing. F9 @ 1/250<sup>th</sup>. 2x Subtronic Alphas.*

AF options on our cameras. These vary massively between models and makes, but to give you an example, I shoot fish mainly on continuous servo AF, with sensors grouped together and set on dynamic closest subject priority. I find having more sensors operational makes it easier for the camera to acquire focus and then the closest subject priority tends to keep the eye (at the front of the fish) in focus as the fish moves about the frame.

Nearly all lenses are good for fish photography, apart from ultra-

wide angles, although faster lenses generally give better AF performance. The best place to start is either with a short macro lens (50-60mm) or a standard zoom, I favour the 28-70mm. It is also well worth experimenting with other lenses, as longer and wider lenses offer different perspectives on our subjects.

There are two key aspects to technique of fish photography: stealth and patience. Good images require us to be up close and personal with the subject. It is essential to approach with slow movements and smooth



*Tightly cropped faces work well with slow moving creatures full of character, like Frogfish. Nikon D2X + 105mm. Subal housing. F29 @ 1/250<sup>th</sup>. 2x Subtronic Alphas.*

steady breathing. Sudden exhalations or jerky movements always spook fish. They are like Jedi – they can feel our presence! If a fish is moving, we shouldn't approach it directly, but instead swim on course so we will intercept its path. Once we have successfully stalked our quarry it is crucial to stay composed and have the patience to wait for the subject to accept us. Once relaxed it will be a much more cooperative, and also these few moments also allow us to observe its routine, which help us predict its movements to plan a shot.

Light is essential in all photography. For fish photography I suggest keeping things relatively simple and front lighting the subject. For single flash shooters this means having the flash directly above the port, and for twin flash systems the flashes should be on either side and parallel to the port. I like to shoot fish in balanced light, as it gives more of a feeling of the environment, but I think that this is more of a personal choice than a guideline.

Finally probably the most important aspect of producing a successful fish image is to get on the eye level of the subject. Eye contact generates appealing images with a good communication between the subject and the viewer. And with a bit of luck we can catch an expression that implies some personality in the subject to make it more endearing. A lack of good eye contact is one of the most common reasons many of my fish images go straight in the trash!

So we have the kit and technique, heck, imagine we even have a cooperative subject. So what types of shots can we take?

1. The Standard ID shot. This classic type of picture generally shows the whole fish, somewhere between 3/4 and completely side on, invariably in a horizontal orientation. Fish photography maestro Roger Steene is the master of these images, letting



*Face profiles often suit fish faces possibly anthropomorphising them. A long exposure was used to burn in the blue background. Nikon D100 + 105mm. Subal housing. F19 @ 1/30<sup>th</sup>. 2x Subtronic Alphas.*

the beauty of the subject speak for itself in simple, uncluttered compositions. Technique (focus, framing, exposure and lighting) must be flawless for these sorts of images to really stand out, and they often benefit from being shot in balanced light, otherwise the fish can look a bit lifeless, as



*Head on shots of free swimming fish are a challenge to shoot, but always grab the attention of the viewer. I always wait for the pectoral fins to come forward before pressing the shutter. Nikon D2X + 105mm. Subal housing. F10 @ 1/100<sup>th</sup>. 2x Subtronic Alphas.*

if snapped on a fishmongers slab! Lens choice is dependant on subject size.

2. The Face Portrait. One of the best ways to get a high impact fish shots is to compose very tightly around the face of the subject, so that no, or very little, background is visible. These images



*Taking pictures of fish is why many of us started taking underwater photographs in the first place. Nikon D2X + 10.5mm FE. Subal housing. F8 @ 1/40<sup>th</sup>. 2x Subtronic Alphas.*

are usually lit entirely with flash and are best shot with longer lenses such as 90-150mm macro lenses, for tight cropping. Non- or slow moving creatures are often the best for these sorts of shots, as they allow us to approach close enough. Fish well suited to this technique are Frogfish, Stargazers, Morays, Boxfish, Pufferfish and Scorpionfish.

3. The Face Profile. A variation of the face portrait, this is another well-used technique where we just show the face from the side, usually as a vertical. In England we have always called this the German composition,

as Teutonic photographers originated it. These images should be uncluttered compositions, with either blue water or black backgrounds. Certain fish tend to lend themselves to this framing, notably Bigeyes, Groupers, Hawkfish, Seahorses and Morays.

4. Head On. These shots generally have high impact with the fish coming right at the camera and look good with either blue or black backgrounds. Longer lenses are ideal for creating head on images of fish, although with tame or friendly species it is possible to get these shots with wider glass. Non- or slow moving



*An alternative for fish schools is to photograph a section of the school with the fish running off all sides of the frame. Here I have used panning to add some movement texture. Nikon D2X + 17-35mm @ 28mm. Subal housing. F8 @ 1/50<sup>th</sup>. 2x Subtronic Alphas.*

species are easiest, but this type of image looks most impressive with free-swimming fish. A useful tip is to wait for the fish opens its pectoral fins before pressing the shutter.

5. Behaviour. Fish behaviour is a great way of adding extra interest to our fish photos. Things to look out for are cleaning, mating, feeding and defence. It is important to learn a bit about your subjects so you know when and where to look for behaviours and will recognise them when they happen and catch the key moment. I won't elaborate here, but

see UWP 17, where there is an entire article on this subject.

6. The Whole School. Schooling is a common fish behaviour. Probably the most pleasing way to photograph a school is with the whole pack entirely within the frame, which space on all sides. Symmetry is good: look for schools with the fish lined up and where the shape of the school forms a pleasing shape, such as a ball, a circle, a pillar or a spiral. Ideally the fish should be coming towards to camera. These images require wider lenses, but rarely ultra-wide angles.



image, showing the perspective of being just another fish in the school. Side on shots work well as balanced light shots, and are a good opportunity to use longer exposures to add some movement blurring (see 8 below). Head on or POV images are best done with filters because they produce better colour throughout the image, and don't suffer flash fall off. Most schooling fish are suitable for these types of shots, and the best images tend to come from polarised, well organized schools.

8. Getting Creative. A final way to add some zip to fish shots is to get creative with the camera. Long exposures, rear curtain synch, panning and unusual compositions can all transform an average fish shot into a fresh interpretation. It is up to us to get in the water and experiment.

In conclusion, I'd like to say that sometimes whatever we do it is clear that a fish does not want to be photographed. When this is the case it is important to recognise it and give up and move on! There will probably be a much more cooperative individual round the next corner. And remember there are plenty more fish... actually I can't bring myself to say it, but you know what I mean.

*To add some spice to this standard shot, I zoomed the lens during the exposure to create this exploding zoom effect. Nikon D100 + 28-70mm zoomed. Subal housing. F13 @ 1/15<sup>th</sup>. 2x Subtronic Alphas.*

Good species for these types of shots are Snappers, Grunts, Sweetlips, Soldierfish, Goatfish and Fusiliers.

7. Wall To Wall Fish. The alternative approach with fish schools is to frame only part of the school so that our frame is wall to wall fish. These shots can either be side on, or taken with the fish head on, parting round the camera. This type of shot can also work as a Point Of View

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The picture on the left was taken with accessories costing around \$3000 (2 x Subtronic Alpha strobes, sync cords and Ultralight arms). The picture on the right was taken with available light only and a \$30 Magic filter, it's all you need!

# Nikon D100 Retrospective

(Digital Sunbursts with *both* kidneys...)

by Don Silcock

When Nikon released their first prosumer DSLR, the D100, in June 2002 it was a game changer in that for the first time “affordable” digital SLR technology was available to serious amateur photographers who use Nikon equipment. The subsequent wide range of underwater housings that were released meant that at last the significant advantages of digital photography were now available underwater.

As I write this at the end of 2005 it is interesting to ponder just how much has changed in the past 2.5 years – Canon has emerged as a very serious player in DSLR’s and has tempted many long term Nikon shooters to cross over to the “dark side”. Canon’s wide range of DSLR technology and sensor formats, plus a very nice set of lenses is very tempting....but Nikon has fought back strongly, if rather slowly!

The D70 is a very affordable camera with one significant advantage over the D100 for underwater use – it’s ability to synchronize with strobes up to a very useful 500<sup>th</sup> of a second. The D2X is a terrific camera, but at a big price, plus you will pay a premium for a housing so overall you are looking at very serious money to go this route – although the crowd of admirers may make it worth it!

At long last Nikon have finally announced the D200, the true successor to the D100 and the digital equivalent of the wonderful F100, which had most of the usable functionality of the mighty F5, but only half the size and price! If the D200 performs

as expected, and Nikon have too much at stake for it not to, it will create significant upgrade demand from the many D100 users.

So as we all ponder our next move in the digital minefield I thought I would take a look back at the D100 and see if I could quantify what it did really well and where it’s real weaknesses are. What prompted me was a recent trip to Raja Ampat in Irian Jaya, Indonesia where, after owning D100’s for over 2.5 years I realized that I now knew the true performance boundaries of the camera when used underwater. Which led me to think about just how many people have actually reached the same point....I also thought that with all the D100 & housing set-ups that are bound to become available in the next 6 months or so, it may provide a reasonable guide to those digicam owners contemplating a DSLR upgrade.

## D100 Strengths

Nikon put a great deal of effort into the D100 and it was positioned as having most of the functionality of the earlier D1 DSLR’s, but with higher resolution (more pixels) and a much lower price. It was a great success for them and a lot were sold.

Based on the F80 film camera the D100 gave real SLR performance with a six mega pixel sensor that matched the resolution of film upto A3 and images produced by the D100, particularly using the



NEF Raw format, are (in my opinion) sharp and of publishable quality.

In short, in the right hands, the D100 is capable of producing stunning images.

## D100 Weaknesses

Probably the weakest point of the D100 is it’s dynamic range, which dpreview.com (Vincent Bockaert) defines as “the largest possible signal divided by the smallest possible signal it can generate. The largest possible signal is directly proportional to the full well capacity of the pixel. The lowest signal is the noise level when the sensor is not exposed to any light, also called the noise floor”.

What this really means to us underwater photographers is that it can be very difficult to get a good result when shooting wide angle with the sun in the frame as the D100’s sensor cannot record detail in the shadows without grossly blowing out the sun and turning it a sickly shade of cyan. For macro and general fish photography I don’t see this dynamic range limitation as an issue as it is pretty

rare to get the sun in the frame and here are two examples from the D100 taken on the Raja Ampat trip.



D100, Subal D10, Sigma 15mm lens @ f11,  
1/60 & ISO 200 – Manual

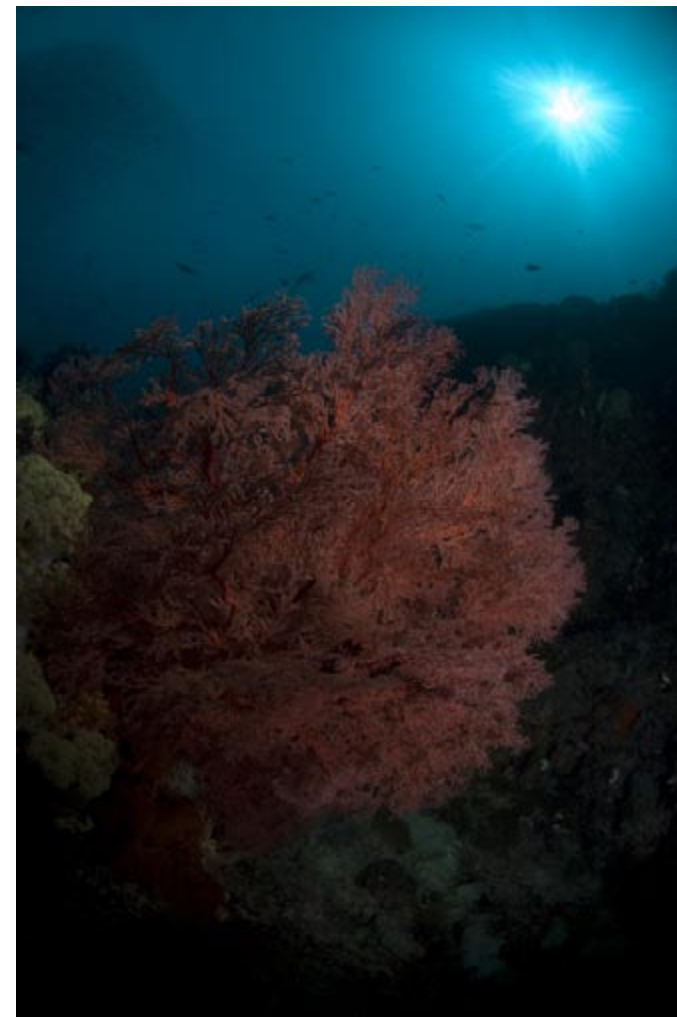


D100, Subal D10, Sigma 28-70mm lens @  
70mm f10, 1/60 & ISO 200 – Manual

However, it can be a real issue with wide angle and here are two examples of the D100 at it's worst during the same trip:



D100, Subal D10, Nikon 10.5mm lens @ f10,  
1/180 & ISO 200 – Manual



D100, Subal D10, Nikon 10.5mm lens @ f22,  
1/180 & ISO 200 – Manual

In the first image I exposed for the coral @ f10, but blew out the sun, whereas in the second I stopped right down to f22 to get the sun under control – but lost all details in the shadows. This is typically where everybody either starts logging on to B&H Photo to work out the upgrade cost or

heads for the bar to drown their sorrows.

I don't pretend to have an answer to the dynamic range limitations of the D100's sensor, my argument is that it *is* possible to work around them and get very pleasing wide angle shots provided you really understand the limitations.

The simplest way to deal with the limitations is to avoid them – shoot with the sun behind you so you don't get the extremes of bright sunlight and details in the shadows. Here is a good example of doing just that at Mike's Point in Raja Ampat:



D100, Subal D10, Sigma 10.5mm lens @ f13, 1/60 & ISO 200 – Manual

If you are shooting into the sun's general direction then you will need two powerful wide angle strobes such as the Ikelite 200's that I use, because the only way to get a good result is to close down the f stop and put the shutter speed at the maximum setting of 180 on the D100.

Stopping down on the f stop brings the sun under control, but the small aperture means you need powerful strobes to punch through and illuminate the subject. Here are two examples:



D100, Subal D10, Sigma 10.5mm lens @ f7.1, 1/180 & ISO 200 – Manual



D100, Subal D10, Sigma 15mm lens @ f16, 1/180 & ISO 200 – Manual

An alternative approach, which I personally have not tried yet, but certainly warrants investigation is the use of neutral density filters to bring the desired image within the dynamic range of the D100. Developed by Berkley White of Backscatter in California, the concept is to use the commonly available filters with a specially made

adaptor on wide & super wide-angle lenses.

A neutral density filter is a glass element that has part of the element blacked to block incoming light and is available with either a "hard line" where the blocking stops or a "graduated" transition from dark to clear. The graduated filter is the one used for underwater and the adaptor is required to rotate the graduation into the right position depending on where the sun is.

The housing's zoom is utilized to rotate the filter, so specific rings are required depending on the actual camera, lens & housing combination.



There are a variety of graduation grades - from clear-to-a-half-stop to as strong as clear-to-4-stops reduction in power and using a 2 stop filter would make it possible to expose the foreground at f8 @ 1/180 to bring out the colors whilst simultaneously bringing the sunburst under control at f16 @ 1/180.

Of course, there is no free lunch and once it's mounted and set up you are limited to that type of photography, however the results appear impressive. More information is available on Wetpixel on the following link:

<http://wetpixel.com/i.php/full/backscatter-neutral-density-underwater-filter-system/>



So in summary, whilst the second generation professional sensor technology in the D2X and the soon to be released prosumer technology of the D200 can offer a lot more than the first generation D100 technology, it comes at a large price and the fundamental question you have to ask yourself is “am I ready?”. I can tell you that I very seriously considered upgrading to the D2X when it was released, but realized that it would be wasted on me as I was not ready for it.

Will I upgrade to the D200? Well probably yes, because I now believe

I am ready for it because I now know the boundaries of the D100 and how to touch them!

So, now that you know just how good the D100 really is it just so happens I know where there are a couple of Subal D10's complete with D100's available.....

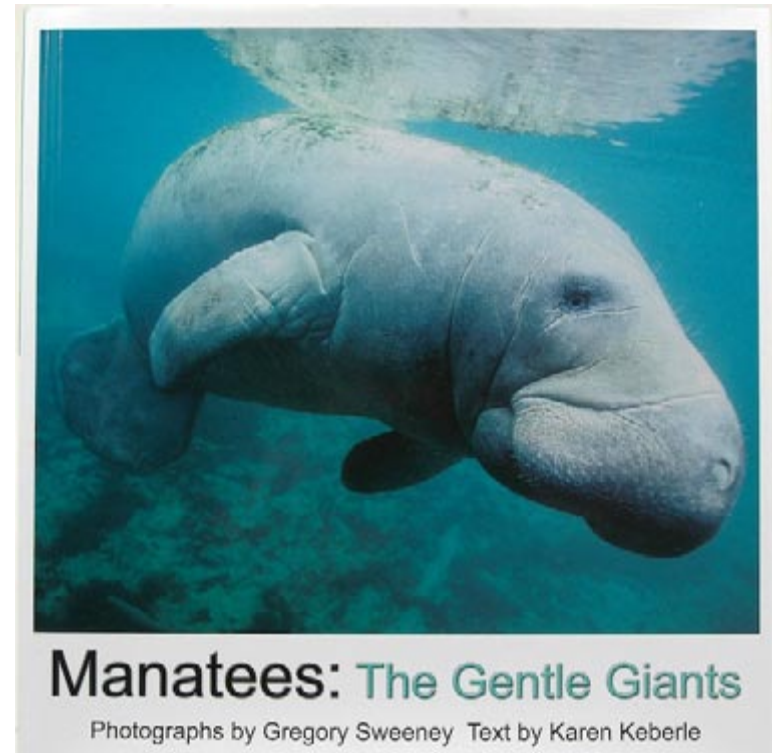
**Don Silcock**

[www.donsilcockunderwaterphotography.net](http://www.donsilcockunderwaterphotography.net)

# Book reviews

## Manatees: The Gentle Giants

Text by Karen Keberle. Photos by Gregory Sweeney



Manatees are rather like dolphins in that they evoke an emotional response from the general public.

This 72 page 20 x 20cm (8" x 8") book is a visual celebration which will appeal to divers and non-divers alike and I am sure will sell well in the Florida tourist shops where tens of thousands come every year to see these amazing creatures.

Manatees: The Gentle Giants is light on text but heavy on excellent underwater photos by Gregory Sweeney and there are some useful contacts at the end of the book for those wanting to see these animals both in captivity and in the wild.

[www.gregorysweeney.com](http://www.gregorysweeney.com)

# TTL Flash with DSLR cameras

by Matthias Heinrichs

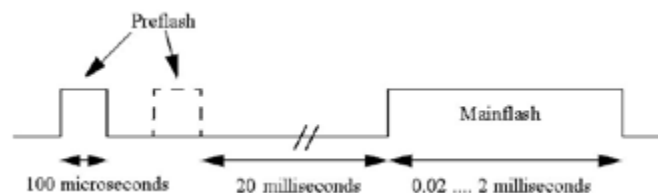
With only one exception (Fuji S2Pro), all digital SLR cameras use a preflash evaluation system for TTL flash exposures. The preflash (or several preflashes) is fired some milliseconds before the shutter opens and the picture is taken.

The mainflash is fired on either at the beginning of the exposure (1<sup>st</sup> curtain sync) or just before the shutter closes (2<sup>nd</sup> shutter sync). Usually the mirror is in the normal position during the preflash so you can see the preflash in the viewfinder even if the interval between pre- and mainflash is very short, only 10 milliseconds at a Nikon D50 for example.

The preflash is required due to the fact that a camera CCD or CMOS sensor can not be read out in realtime during the exposure to determine that enough light has been emitted from the strobe and so the strobe can be quenched in real-time.

Old, film-based TTL used reflected light from the film surface to feed a dedicated flash sensor. Silicone sensors do not reflect enough light for this, so light sensors in the swing mirror housing do this during the preflash. If the preflash is fired using a known and constant power level, the camera can calculate the amount of light needed for the actual exposure.

Strobes for TTL used with DSLR cameras need to be capable of firing the low-power preflash, e.g. 1/64 and the mainflash (e.g. 1/256 to 1/1) within a short period of time.



*This shows typical timing of a preflash DSLR camera.*

To trigger a Xenon flash tube rapidly without damage to the tube and circuitry, it's important to quench the tube very fast and include a trigger circuit to trigger the tube fast enough.

All modern strobes use an IGBT (Insulated Gate Bipolar Transistor) to cut off the high currents of the flash tube. In powerful strobes (400Ws and more) currents can reach more than 500Ampere at 360Volts! Older strobes with SCR (Silicon Controlled Rectifier) quench circuitry are capable of triggering two flashes within 100...150ms - too slow for any preflash DSLR.

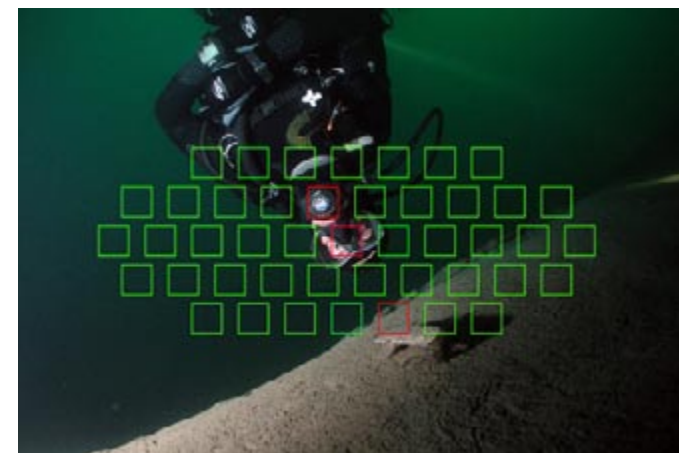
An interval of 5ms makes a modern strobe compatible with nearly all DSLR cameras, e.g. Inon D2000W or Subtronic Maxi TTL. Housed Flash guns will work in TTL, of course but compared to an underwater strobe they do not provide much power and coverage and the controls are not as comfortable as the big knobs and bright LED controls on underwater strobes.

To convert the camera-specific flash protocol to the quasi-standard, old Nikonos system a conversion circuitry is required. This can be integrated in the housing, the strobe or in the sync

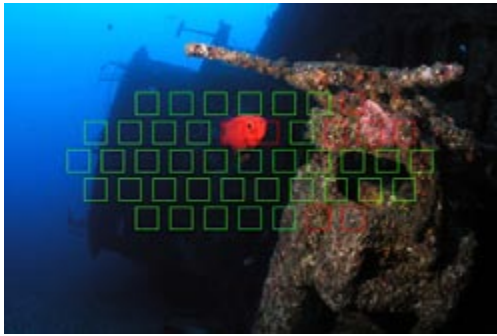
cable between them. A protocol converter for a DSLR is a small microprocessor translating the camera language into the simple flash commands of an underwater strobe.

In normal exposure mode, a matrix metering system is used but the main subject (which is locked with the autofocus) is still an important factor for the flash power.

Without switching to manual flash exposure a subject filling only a few percent of the frame is exposed correctly.

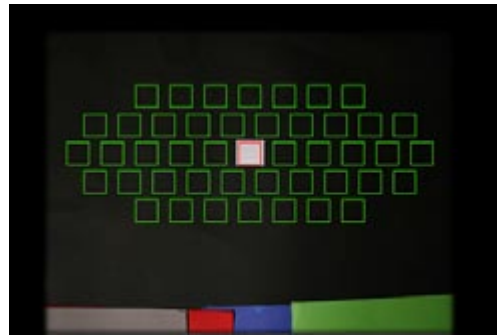


*Matrix evaluation, example 1: A dark subject (Diver) with some reflective objects in the AF fields. To avoid overexposure the flash was fired in low power. A conventional TTL system, as in the Nikonos V, would have clipped the highlights on the regulator or in the face.*



or in front of a dark background without switching the strobe to manual. After pressing the FEL button (\* at Canon DSLR) the camera uses the currently selected AF point to evaluate the flash exposure. The result is stored until you press the shutter so you can reframe your picture and the flash will be fired with the stored power level.

These two pictures show the flash exposure pattern in Canon cameras (Here, a Canon 1D). The metering is set to center, a Subtronic Maxi E TTL is used for this test. A small white sheet is placed in a sheet of black paper.

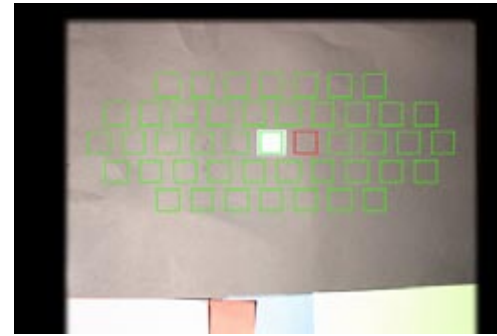


*Spot evaluation, correct exposure. The camera did not try to expose the black background and fired only a small mainflash.*

***Matrix evaluation, example 2: The camera did the right decision not to illuminate the wreck because active AF points are on a near subject.***

Compared to a simple average from older film cameras even an entry-level DSLR camera uses a sensor pattern of 30-50 sensors for flash exposures. Different manufacturers use different algorithms for their flash evaluation. Besides the information from the preflash, the aperture, focal length, ISO setting and white balance is used to calculate the power of the mainflash. In normal mode, the multi-sensor pattern and the algorithm behind it tries to find a balance between bright and darker parts of the image to achieve a good result. In special modes, like Spot metering, the user can benefit from this complex system.

Flash Exposure Lock (FEL), for example, allows a pre-metering of the subject using only a very small portion of the image. Good if you want a reflective object in blue water



***Spot evaluation, overexposed. The same setup but the active AF point is on the black background. The camera tries to expose the black paper to some 18% grey and the picture is heavily overexposed.***

As you've probably gathered by now, TTL flash control with DSLR cameras is a very complicated business!

**Matthias Heinrichs**

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Does your  
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# Guidelines for contributors

The response to UwP has been nothing short of fantastic. We are looking for interesting, well illustrated articles about underwater photography. We are looking for work from existing names but would also like to discover some of the new talent out there and that could be you! UwP is the perfect publication for you to increase your profile in the underwater photography community.

The type of articles we're looking for fall into five main categories:

**Uw photo techniques** - Balanced light, composition, etc

**Locations** - Photo friendly dive sites, countries or liveaboards

**Subjects** - Anything from whale sharks to nudibranchs in full detail

**Equipment reviews** - Detailed appraisals of the latest equipment

**Personalities** - Interviews/features about leading underwater photographers

**If you have an idea for an article,  
contact me first before putting pen to paper.**

E mail [peter@uwpmag.com](mailto:peter@uwpmag.com)

## How to submit articles

**To keep UwP simple and financially viable, we can only accept submissions by e mail and they need to be done in the following way:**

1. The text should be saved as a TEXT file and attached to the e mail

2. Images must be attached to the e mail and they need to be 144dpi

Size - Maximum length 15cm i.e. horizontal pictures would be 15 cm wide and verticals would be 15cm.

File type - Save your image as a JPG file and set the compression to "Medium" quality. This should result in images no larger than about 120k which can be transmitted quickly. If we want larger sizes we will contact you.

3. Captions - **Each and every image MUST have full photographic details** including camera, housing, lens, lighting, film, aperture, shutter speed and exposure mode. These must also be copied and pasted into the body of the e mail.

# Parting shots

A late afternoon dive at Batu Kelebit on Bali's north-east coast, was intended to be an introduction to the dive site for a friend of mine who hadn't dived there before. The day was overcast and the late afternoon sun was not penetrating the deeper waters very well. We caught a brief glimpse of a grey reef shark cruising in open water, but decided it was too dark for photography. We headed back up the slope to spend more time in the brighter shallows.

There appeared to be an unusual amount of fish life swarming around the prominent coral heads that dominate the shallows. A turtle was poking around the hard corals and a black-tip reef shark cruised between us heading slowly off to deeper water.

Shallower still, we stumbled into a group of seven large cuttlefish, all congregating around a large patch of fire coral. Their presence seemed to have the smaller reef fish interested, as they were all much more active than normal, darting around the reef in a busy manner. It took a minute or so to realise that this was a cuttlefish mating aggregation.

One of the cuttlefish was being an exhibitionist, with tentacles spread wide; its whole body was a flashing display of black & white stripes.



Another of the large cuttlefish slowly approached the black and white 'flasher', and together they sped a short distance away from the others.

Hovering just above the reef, the courting pair began eyeing each other at close range then met head-on with arms flaying, in what was now a confused mass of black & white striped arms and bodies. I managed to approach close enough to get a photo. Close enough that is - not to frighten them off. Now feeling somewhat like an intruder, I got closer still as they simultaneously turned a soft shade of grey then locked together, head to head in their mating position.

I 'flashed' away with my camera and thirty seconds later it was all over. The larger female then made her way up the reef to a patch of fire coral and



*Olympus C-5050Z, Olympus PT-015 Housing, 2x Inon Z220 strobes, Manual exposure f4.5 @ 1/125th, ISO 64.*

began carefully depositing her eggs under the protective outer mantle of the coral branches. All the time watched over by one of the other large females.

We watched transfixed for over half an hour, as these creatures that I have always held in awe, continued courting, mating and laying their eggs around the reef, just as though we weren't even there - nature at its best!

**Jeff Mullins**

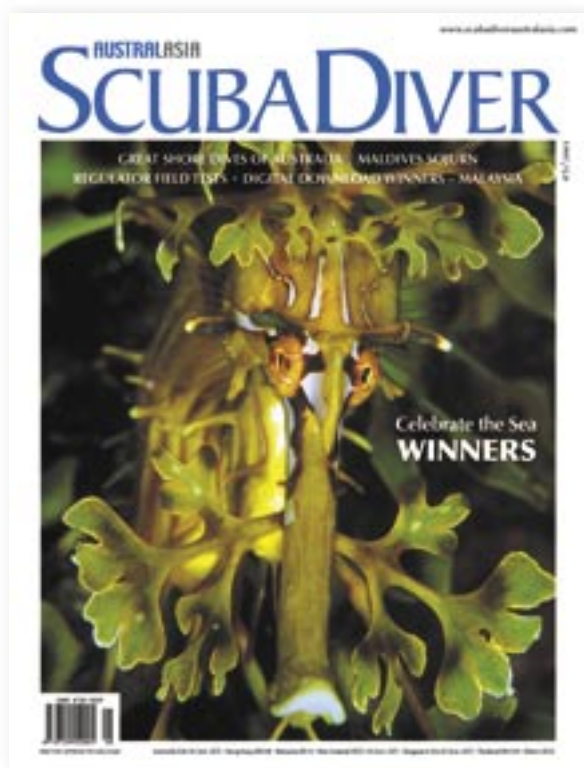
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**Jeff and his wife Dawn are the authors of Reef Wreck & Critter a visual guide to the Tulamben area in Bali, they run guided dive tours from their property near Tulamben,**

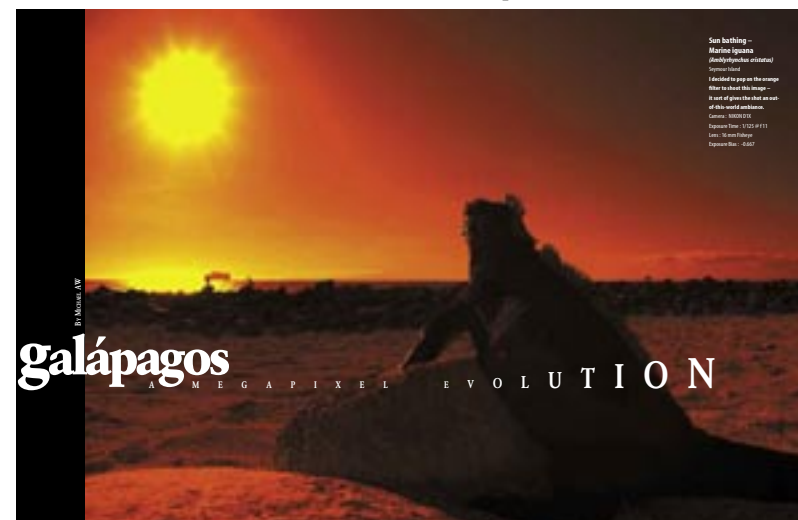
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