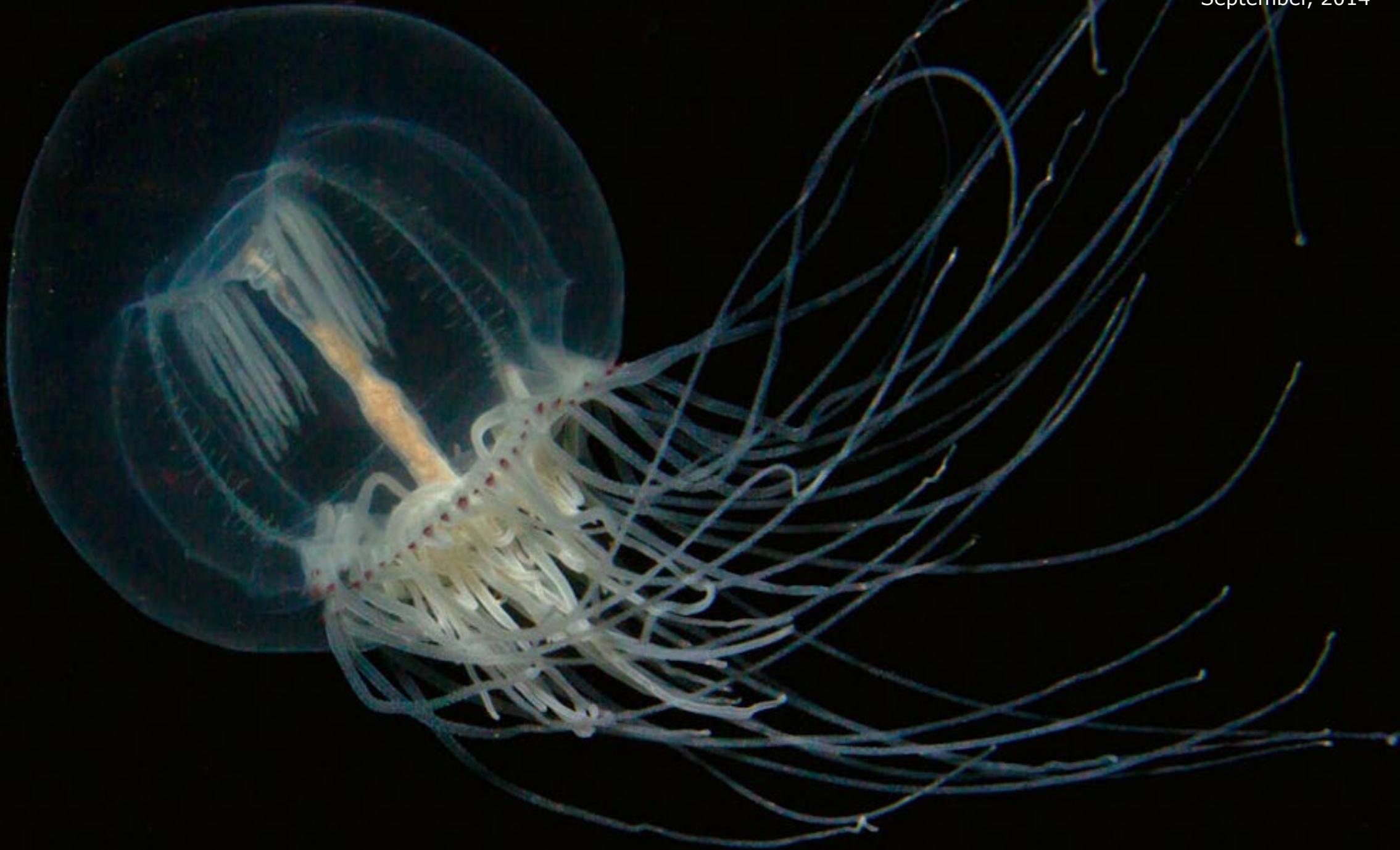


Pacific Northwest Diver

Publication of the Pacific Northwest Underwater Photographic Society
September, 2014



Medusa by Bob Bailey
Canon Rebel T2i | 60 mm | 1/100th | f 16 | ISO 100

Pacific Northwest Diver

BIMONTHLY MAGAZINE & WEB SITE PROMOTING UNDERWATER PHOTOGRAPHY, EDUCATION, & TRAVEL IN THE PACIFIC NORTHWEST | SEPTEMBER, 2014

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Pacific Northwest Diver: In This Issue

Our September, 2014 issue features three excellent photographers: Santa Barbara base photographer and author Richard Salas, a Nikon D300s user, point and shoot Vancouver, BC area photographer Lisa Zazzi, and DSLR Canon photographer Bob Bailey from Federal Way. Each of these photographers offer good tips on underwater photography. Richard's three books series is presented on page 10. The featured operator is Salmon Safari in Campbell River, BC, and our travel corner contains a portfolio of photos from a recent dive with them on the Heber and Campbell Rivers. The Technical Corner presents Optical Ocean's revamped Resource site, and includes a very useful strobe and light comparison. The News Corner discusses Puget Sound eelgrass recovery. Please enjoy!

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Shedding New Light on Eelgrass Recovery

by Katie Harrington

Scientists say eelgrass, an unassuming flowering plant found just off shore in Puget Sound, is vital to the health of the ecosystem. They also say the plant is declining. New and increasingly urgent efforts to restore it brought a group of researchers to the 2014 Salish Sea Ecosystem Conference this past May.

It harbors as much life as an old growth or tropical forest, and it hides in the waters just off shore. Without it, scientists say, there would be precious few salmon or herring, and little prey for orcas. It means hundreds of millions—perhaps billions—to the local economy, and chances are, most Puget Sound residents have never heard of it. It is eelgrass, and there may be no plant more central to Puget Sound's environmental wellbeing.

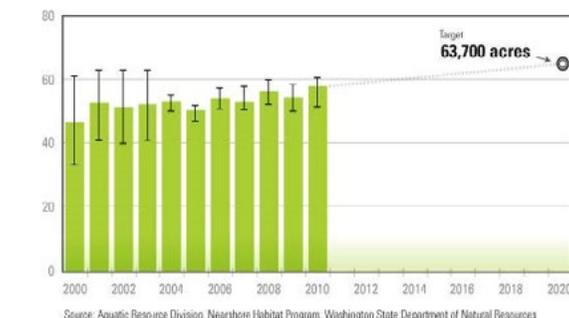
“Eelgrass is critical to what we know and love about Puget Sound,” says Ron Thom, a biologist working on eelgrass restoration at the Pacific Northwest National Laboratory.

Like most scientists who study the plant, Thom is something of an eelgrass evangelist. He ticks off just a few of the plant's benefits: Eelgrass protects young salmon and shellfish such as Dungeness crabs. It stymies coastline erosion with its root and shoot system, and is central to the food web. Its narrow, olive-colored leaves house millions of tiny organisms that will in turn feed larger invertebrates, and eventually, the fish we catch and the birds and whales we watch.

In short, healthy eelgrass (*Zostera marina*) indicates a healthier Puget Sound, which is why Thom and a group of scientists were out on the water last summer planting some unusual garden plots. Studies show that eelgrass is in decline in significant areas of Puget Sound, and scientists are looking for ways to bring it back to its historical levels. In a very literal way, they hope to plant the seeds of Puget Sound recovery.

Why not just plant more?

Acres of Eelgrass in Puget Sound
in thousands, 2000-2020



Pacific Northwest Diver: News Corner

One of the goals set by the state's Puget Sound Action Agenda is to add 20 percent more eelgrass to the region by 2020. But three years into the effort, there's been little or no progress, and growing perplexity. Studies show that some eelgrass beds are increasing while others are in decline. Several sessions at the 2014 Salish Sea Ecosystem Conference featured new research and possible new directions for recovery efforts.

If eelgrass is declining, why not just plant more of it? That's one of the ideas under consideration by state and federal agencies. Last summer, divers planted nine experimental plots at five sites in Puget Sound, including sites of unexplained eelgrass loss.

As part of the process, Thom, along with his colleagues at the Washington State Department of Natural Resources and the Environmental Protection Agency, unveiled a computer model that identifies areas in Puget Sound where eelgrass could potentially thrive. The model compiles instrument readings from across the Sound, including light availability, salinity, temperature, and depth. When the right measurements align, the model suggests a planting site.

Light in particular is key, says Thom. It turns out that getting enough of that precious resource can be a challenge. Eelgrass evolved as a shade-adapted plant, able to thrive in the region's relatively low light. But other, human-caused factors appear to be changing conditions beyond the plant's tolerance.

One of those factors is increased nitrogen. While eelgrass needs nitrogen to survive, too much of it sends phytoplankton, the plant's algal neighbors into a frenzied growth that blocks sunlight. Without the light, eelgrass can't harvest energy through photosynthesis. Fred Short of Washington's Department of Natural Resources, has been studying this phenomenon, and says it is localized in certain areas of Puget Sound with higher pollution.

"It's an issue in parts of Puget Sound, not all of Puget Sound," he says, but where it occurs the evidence is fairly obvious. "Stick your camera under the water and take a picture and it's just green [with phytoplankton]," says Short.

Short first noticed the problem of decreasing light for eelgrass on the East Coast and has been testing whether the same situation exists in Puget Sound. As on the East Coast, eelgrass is "not growing as deep as it used to grow," he says, "which is a good indicator of decreasing water clarity." Potential causes include stormwater runoff, failing septic tanks and sewage treatment discharge. Runoff from dairy and meat production also boost nitrogen.

The planting model seems to support that idea. It predicts less success for eelgrass near places like southern Puget Sound, where higher nitrogen levels occur. Most of the experimental plantings followed the model's predictions, while a few struggled for unknown reasons. Last summer's work was a first step in what researchers expect to be an ongoing process.

If nitrogen pollution is a significant barrier to eelgrass recovery, then scientists are not without hope. Water quality can get better, they say. "We can enhance the [eelgrass] productivity of the Sound and prevent it from degrading further," says Short, who points to solutions like improving sewage treatment plants and filtering stormwater and agricultural runoff.

Even so, scientists acknowledge that many other threats to eelgrass remain, from heavy metals to shoreline development, damage from boat propellers and dredging and even emerging concerns like eelgrass wasting disease. They also point to the specter of climate change.

Paradoxically, ocean acidification, the result of increased carbon dioxide absorption from the atmosphere into Puget Sound waters, could actually benefit

eelgrass because it would increase carbon dioxide used by the plant; but as the oceans warm and sea levels rise, climate change also threatens fragile habitat.

Scientists say the key for them will be to adapt as conditions change and as new information becomes available.

One strategy is to take a so-called portfolio approach. Some argue that responding to every single threat to eelgrass, while desirable in theory, might not be practical and could take huge amounts of resources. A May 2014 article in the journal *Coastal Management* reviewed comments from 19 scientists who study eelgrass in the region, and suggests narrowing efforts to several areas with the most potential for eelgrass restoration.

The article points to overwater structures, nitrogen pollution and shoreline armoring as key focus points, and scientists are looking at how this might apply to local management actions.

Just weeks before the Salish Sea Ecosystem Conference, representatives from multiple agencies including the Department of Natural Resources, Puget Sound Partnership, Department of Ecology, the University of Washington's Puget Sound Institute, NOAA, the Samish Tribe, the Washington Association of Counties and other groups, met to launch the Puget Sound Eelgrass Recovery Strategy.

The group will examine why eelgrass recovery has faltered, and will keep an eye on experiments like those by Thom and others searching for new breakthroughs.

"Every time you do a restoration project, it's an experiment," says Thom. "We need to be clear about linking the action to the response in a systematic way and learning from it. If we're seeing an improvement, we can better predict what we need to do in the future to make it work for [eelgrass] to come back."

Pacific Northwest Diver: Richard Salas



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I went to Brooks Institute of photography back in 1975 where I first learned how to dive and shoot underwater. I was lucky enough to get a job on the “Just Love” –Brooks Institute’s boat- and to be mentored in underwater photography by Ernie Brooks.

After graduating from Brooks in 1979 I didn’t dive for the next 25 years. I was in LA concentrating on getting work, paying back school loans, creating a family and buying a house. Chasing the American dream. Then in 2004 my oldest son graduated from the local university and before he went to law school we went diving. I got down there and remembered how much I loved it. I’ve been diving ever since.

Now I get to live just 24 miles from Santa Cruz Island, the biggest of the California Channel Islands, in Santa Barbara. The four islands off our coast provide some of the best semi cold-water diving around.

In the last ten years I have produced two coffee table books, [Sea of Light - Underwater Photography of California’s Channel Islands](#) and [Blue Visions - Underwater Photography from Mexico to the Equator](#). I am now working on the third book of the trilogy, [Luminous Sea - Underwater Photography from Washington to Alaska](#) the last in the Sea of Light series, which spans from the Equator to Alaska.

My favorite dive places are Saanitch Inlet where I hung out with a 9 foot octopus, the Steller Sea Lions at Hornby Island, everything at God’s Pocket Resort and swimming with Hammerhead sharks in the Galapagos Islands.

If someone asked me for one bit of underwater photography advice, I’d say don’t sacrifice lighting just to avoid backscatter. I personally think too many people would rather set a light on each side of the camera and set it on TTL just to get a properly exposed shot, not the best shot. Lighting has everything to do with a quality image, texture, roundness, three dimensionality, etc.

I teach underwater photography up at God’s Pocket, and on the Truth Aquatics boats in Santa Barbara, California and also in Mexico. I focus on lighting and how to creatively say something about your subject with your photography, not just record it.

The equipment I use mostly is a Nikon 300s in a Subal housing with 2 Inon 240 strobes. For macro I use a 60mm and a 105mm. For wide angle the Tokina 10mm-17mm. Pre-processing is Lightroom and post Photoshop on Macs. The bigger the better!

While I realize that, as an individual, I have never been more than a drop of water in the face of the vastness of the ocean, I have also seen that, as a species, humanity’s collective weight is having a profound impact on its watery resources. So, with my lights and with patience, I create dimensionality in my photographs of these critters so that they leap off the page to greet the viewer.

I am committed to using my art and technique to spark in others both a reverence and a sense of responsibility for the ocean and its creatures. Through photography I expose viewers to new ways of connecting to the underwater world and its inhabitants so that they, like me, may feel the heartbeat of our precious ocean planet.



Decorated Warbonnet by Richard Salas
Nikon D300S | 60 mm | 1/60th | f 22 | ISO 200



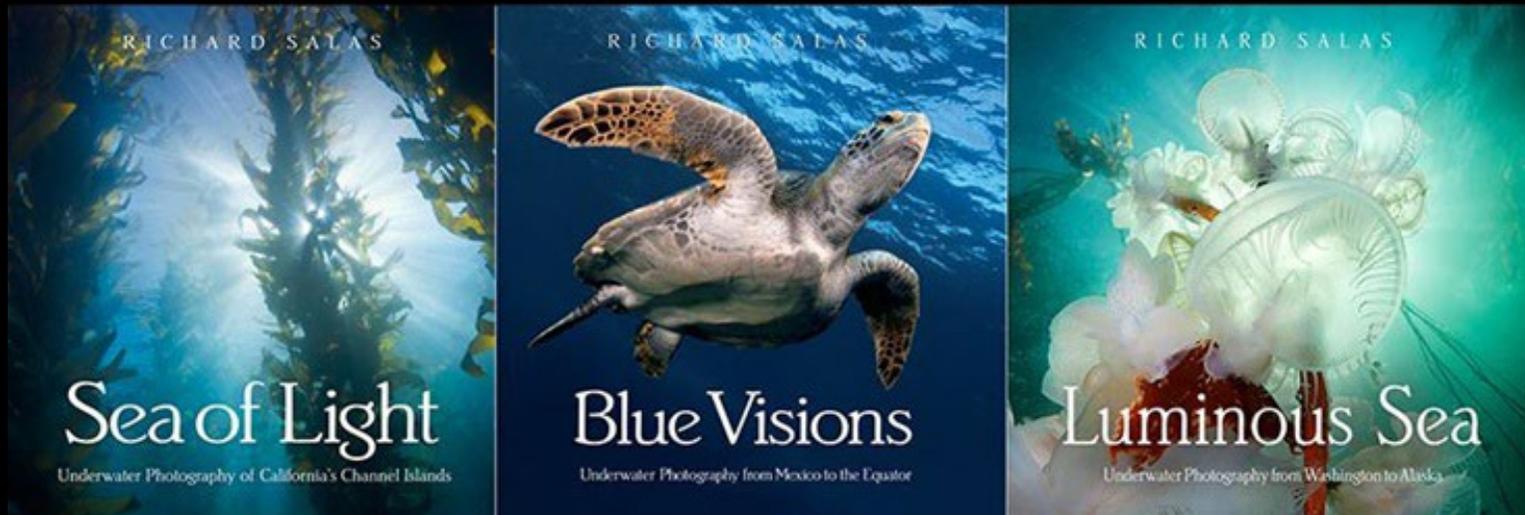
Hooded Nudibranch with Sun by Richard Salas
Nikon D300S | 12 mm | 1/320th | f 25 | ISO 200



Giant Pacific Octopus by Richard Salas
Nikon D300S | 10 mm | 1/160th | f 14 | ISO 200



Brooding Anemones by Richard Salas
Nikon D300S | 60 mm | 1/60th | f 22 | ISO 200



As mentioned in Richard's introduction, he has authored and published two underwater photography books, with a third scheduled for distribution this Fall. The concept is to provide a selection of images from the equator to the polar region.

Sea of Light covers California's Channel Islands, and Blue Visions provides images from the equator to Mexico. The soon to be released Luminous Sea deals with subjects from Washington to Alaska.

Copies may be purchased from [Richard's site](#), with electronic versions available at the [Apple Store](#).

Pacific Northwest Diver: Lisa Zazzi



Lisa has been a water-baby all her life. She even worked as a lifeguard for a few years. Her first diving experience was a Snuba Dive in Maui in 1996, followed by a Discover Local Dive down to 40 feet off Dominica in 2004.

She finally “bit the bullet” in 2004 by completing her Open Water and Advanced Open Water. She completed her first 100 dives nine months later. She currently has over 400 dives. She joined the Coquitlam Scuba club in 2007 and became President in 2009.

Lisa started underwater photography in 2007. Like many of us, this began as a way to bring her diving experience to friends and family who do not dive. She says she is “very much a point-and-shoot photographer.” She goes on to say she knows very little about f-stops and apertures, because she likes to keep underwater photography as simple as possible.

That said, she has been working on various techniques in order to see if she could achieve good results with minimalist gear, and keep up with some of the excellent club photographers.

Her underwater shooting started off with a Fuji FinePix f40 fx and just a hand-held HID light, which was upgraded to two Itorch Video Pro 4 video Lights. In 2012 Lisa upgraded her camera to a Sony NX5 in an Aquatica housing. She has begun experimenting with a filter for green water on some photos.

For post processing Lisa uses a MacBook Pro, and Iphoto for editing photographs. Most of her editing consists of backscatter removal, with some colour correction, sharpening, and cropping.

When asked about what she has learned over the years, and what she would like to pass on to others, Lisa listed five things: 1.) In Northwest waters, good lighting is your Best Friend; 2.) Be calm and steady when taking photos; 3.) Have good bouyancy skills, and be careful about taking underwater shots before you have refined this skill; 4.) Dive often and take a lot of photos to see what works for you; and 5.) Don’t be afraid to experiment with different settings and equipment.

Email: sglisa@shaw.ca



Crimson Anemone with Candy Stripe Shrimp by Lisa Zazzi
Sony NEX-5N | 29 mm | ISO 160, 1/60th, *f* 4



Water Jelly by Lisa Zazzi
FinePix F40 | 8 mm | ISO 200, 1/320th, *f* 2.8



Orange-Peel Nudibranch by Lisa Zazzi
Sony NEX-5N | 29 mm | ISO 160, 1/60th, *f* 4



Vermilion Rockfish by Lisa Zazzi
Sony NEX-5N | 29 mm | ISO 160, 1/60th, *f* 4

Pacific Northwest Diver: Bob Bailey



I got into diving quite by accident, when my wife decided to buy me scuba lessons for my 49th birthday. It was one of those things I'd always said I'd like to try, never realizing that she'd take me seriously. But when I took that first breath from a scuba regulator, I knew I'd discovered something very special. Since that day in February 2001, I've logged more than 3,300 dives, mostly here in the Pacific Northwest. For four years I progressed from OW student to scuba instructor, and then into the kind of diving that requires double cylinders, trimix and deco bottles. In 2009 I traveled to Florida to learn cave diving, and have since made several trips to Florida's panhandle and Mexico's Yucatan Peninsula to satisfy a growing obsession for dark holes and wet rocks. But I mostly prefer diving the emerald waters we call home.

I first took up underwater photography in 2005, in preparation for an upcoming dive trip to Bonaire. As with that first breath underwater, I knew right away I'd found something that would help me keep my interest for many years to come. My first underwater camera was a Fuji F10, which I

purchased used from a friend who was upgrading to a newer camera. Over the next few years I went through a succession of small, inexpensive point and shoot cameras, working my way up to a Canon G10 and a pair of Sea & Sea YS110a strobes in 2009. Then in 2012 I took the next step by replacing the G10 with a Canon T2i – my first DSLR. My preferred lenses are the Canon 60mm macro lens, which I use almost exclusively in local waters, and a Tokina 10-17 wide angle lens for when I dive the more clear waters of the caves or the tropics. For post-processing I prefer Lightroom, due to its ease of use and cataloguing abilities.

I live in Federal Way, just a short drive from Redondo, which is my underwater “office”. My favorite time to dive there is between November and March, when the visibility is at its best and the shallows turn into underwater nurseries. In January 2013 I undertook a project to build a small rock reef on the south side of the fishing pier, consisting of three piles of rocks, each 6 to 8 feet in diameter and perhaps 3 feet high. It was my hope to create a habitat for Giant Pacific Octopus, and as I was stacking the rocks in each pile I carefully constructed a space for a den, leaving an opening in each that was wide enough to take pictures through.

Happily, each rock pile was occupied within just a few months of being built. But to my disappointment, each new resident rearranged the rocks to remove the “window” I had so carefully planned for monitoring their progress. Octopuses do like their privacy, after all. But the rock piles, which a friend of mine has taken to calling “Stonehenge”, has blossomed with life as many of the Puget Sound creatures who prefer rocky structures have found it attractive.

Like many underwater photographers, I learned most of what I know by experimentation, seeing what works and what doesn't, and taking tens of thousands of pictures over the past nine years. The hardest part of the learning curve was lighting. Learning how to position strobes to produce the desired effects without excessive backscatter or distracting shadows is an art form I refer to as “strobology”. I advise anyone thinking to invest in strobes to get the best ones you can afford – they are often more important to the end result than the camera and lens you're using.

My advice to newer divers is to concentrate on developing good diving skills before you take a camera underwater. The skills that are most important to an underwater photographer are excellent buoyancy control, the ability to move without kicking up silt, and buddy skills sufficient to be able to devote your attention to what's going on outside of what you're looking at in the viewfinder.

The responsibilities of being a dive buddy do not end when you pick up a camera, although they do become more difficult. So work on those skills first, and then you'll be able to focus on your photography without sacrificing either your visibility or your safety.

Don't be afraid to experiment. Take lots of pictures, be willing to discard most of them, and never lose sight of why you got into diving in the first place, which is to have fun.

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NWGratefulDiver

White and Orange Tipped Nudibranch by Bob Bailey
Olympus SP350 | 8 mm | 1/60th | f 5.6 | ISO 100



Opalescent Squid Capturing Tube Snout by Bob Bailey
Canon Powershot G10 | 6 mm | 1/100th | f 6.3 | ISO 100



NWGratefulDiver

Giant Pacific Octopus Suckers by Bob Bailey
Canon Rebel T2i | 60 mm | 1/100th | f 11 | ISO 200



Juvenile Wolf-eel by Bob Bailey
Canon Powershot G10 | 6 mm | 1/100th | f 5.6 | ISO 200

Pacific Northwest Diver: Salmon Safari

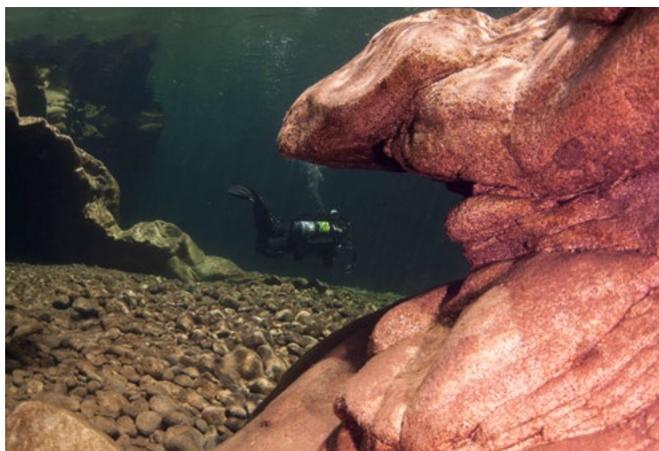


Have you ever wanted to add salmon photos to your portfolio? Or go diving in some of the most beautifully carved river canyons around? If this sounds interesting, check out Salmon Safari, run by Eiko Jones out of Campbell River, BC on Vancouver Island.

Last month we spent several days diving and snorkeling with Eiko, and had an amazing time. Our first stops were the Gold and Heber Rivers, where we dove a salmon pool and Heber River Canyon. This area is about an hour and a half drive southeast of Campbell River (see map opposite).



Eiko timed our dives so that the lighting was perfect to include "God Rays" in our photos. The salmon and cutthroat were surprisingly approachable. After the Gold River salmon pool, we moved location a few hundred yards to the Heber River Canyon entry, with pink granite formations in crystal clear water. For those of us used to the less



than clear salt water, it was great fun to look up and photograph the bridges and trees above the canyon from underwater.

Our final day was, perhaps, the highlight of the trip. We moved just outside the city of Campbell River, and shuttled our camera and snorkeling gear down a trail and across the river. Swimming across a 4-5 knot current for a few yards was quite exciting!

Popping below the surface were thousands and thousands of pink salmon: literally wall to wall fish! It was simply



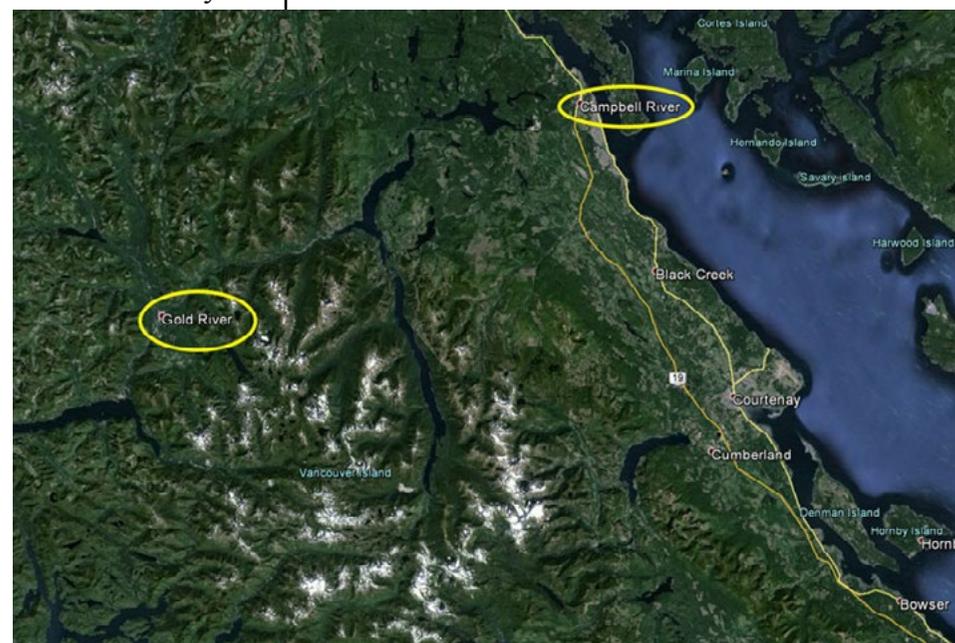
amazing. Alex Tanz commented that salmon were bouncing off his dome port!

Not only are Eiko and his crew excellent guides, Eiko is an outstanding photographer who is more than willing to share his tips. What a fun trip!

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Travel Corner: Heber and Campbell Rivers Trip Photos

This month's operator is Eiko Jones (striped shorts) of Salmon Safari in Campbell River, BC. We recently returned from a great outing with him, and thought it would be appropriate to share some images.



So here they are: first Heber River as seen by Pat Gunderson (upper left), Kerry Enns (right), and Alex Tanz (lower left)!



Travel Notes: Heber and Campbell Rivers

Campbell River Pink Salmon

(Clockwise from top left: Pat Gunderson, Kerry Enns, Dan Clements, Alex Tanz)



OPTICAL OCEAN SALES UNDERWATER PHOTOGRAPHY EQUIPMENT

Optical Ocean Sales in Seattle has done a major revamping of their on-line educational material. It is now called the Resource Center, and it contains very good information about shooting underwater.

The page is organized into Handbooks, Guides and Articles, Trip Reports, Reviews, and two charts: Strobe Comparison, and Light Comparison.

The Handbooks section currently consists of five pamphlets:

1. Starting Concepts (Get Close, Lighting, Eye Contact, Shoot Up, etc)
2. Composition (Horizontal, Vertical, Rule of Thirds, Focal Point, etc)
3. Close Focus Wide Angle (Definition, Techniques, Lighting, Settings)
4. Choosing an Underwater Lighting System (Need, Type, TTL)
5. Maintenance (O-Rings, Housing, Dos & Don'ts)

The Guide currently has four well discussed topics:

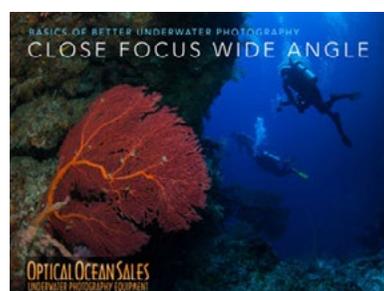
1. Setting up a Panasonic GH4 for Diving
2. Recommended lenses for underwater photography
3. Choosing an underwater photo lighting system (same as handbook)
4. Housing and O-ring Maintenance (same as handbook)

The Trip Report section is useful if you are planning an outing with Optical Ocean, or are curious about shooting options in various locations. Trips to the Sea of Cortez, Palau, Kona, Fiji, and Galveston are covered.

I have found the Strobe and Light Comparison charts (next page) extremely useful. It is really nice to see a comparison of what the major brands can do prior to making a purchase. Due to space limitations, specs for Fix and Keldon lights are not shown. Visit the Optical Ocean web site for a full copy of the light specification comparison sheet.

The revamped Review section contains articles about new equipment on the market. Some of the recent write-ups include description of shooting with a mirrorless rig, beginning underwater photography with a Canon SL1 vs Sony RX 100, and a comparison of the new Nikon D7000 and D800.

There is much good information on the Optical Ocean web site. The staff is also very good at providing information either over the phone (800.359.1295), or for Northwest divers, in person at the shop (1800 Westlake Ave N., Suite 201, Seattle, WA 98109).



OPTICAL OCEAN SALES Strobe Specifications Comparison Chart

UNDERWATER PHOTOGRAPHY EQUIPMENT

	Sea & Sea				Ikelite			Fantasea	Olympus	SEACAM			Inon		
Product Name	YS-D1	YS-01	YS-02	YS-250 Pro	DS-51	DS-100	DS-161	NanoFlash	UFL-2	1800	1800 Offshore	1800	Z-240	D-2000	S-2000
Price	\$699.95	\$429.95	\$319.95	\$1,099.95	\$399.95	\$949.95	\$1,099.95	\$119.95	\$69.95	\$2,405	\$3,036	\$2,971	\$799	\$665.00	\$530.00
Guide Number	Variable: GN 32-GN 24, GN 20	20	20	32	17	24	24	12	10-18	UV GN*10 (Equip ~30)	UV GN*14 (Equip ~42)	UV GN*14 (Equip ~42)	24	20	20
Beam Angle	80x80°, 100x100°, 120x120°	100x100° (width 115x115°)	100x100° (width 115x115°)	105x105° (width 115x115°)	70° (width 80°)	90° (width 100°)	90° (width 100°)	78°	78°	130°	130°	130°	100 (width 110)	100 (width 110)	110 width
Batteries	4xAA, A.V.D, NiMH 4.5V	4xAA, A.V.D, NiMH 4.5V	4xAA, A.V.D, NiMH 4.5V	NiMH for YS-250	4xAAA (Alkaline, Li-Ion, NiMH or NiCad)	Rechargeable 7-4V Li-Ion Battery	Rechargeable 7-4V Li-Ion Battery	2x AAA batteries	2x AA batteries	NiMH Rechargeable battery pack	NiMH Rechargeable battery pack	NiMH Rechargeable battery pack	AA x 4	AA x 4	AA x 4
Number of Flashes at Full Power	A: 150, NiMH 250	A: 230, NiMH 330	A: 230, NiMH 330	200	200 full power	480	480	200	200	280	200	200	Approx. 290 per charge	Approx. 600 per charge	Approx. 630 per charge
Recycle Time (full)	A: 2.8sec NiMH 1.8sec	A: 2.5sec NiMH 1.8sec	A: 2.5sec NiMH 1.8sec	1.8sec	3.5 sec	1.4 sec	1.4 sec or less	N/A	6 sec	1.2 sec	1.2 sec	1.2 sec	1.6 sec	1.8 sec	1.9 sec
Color Temp	5500K	5500K	5500K	5500K	5700K	4800K	4800K	N/A	5500K	4400K	4400K	4400	5500K	5500K	5500K
Color Temp w/ Diffuser	5200K	5200K	5200K	5200K	N/A	N/A	N/A	N/A	Not Included	N/A	N/A	N/A	5400K	5400K	5400K
Depth Rating	100m/330ft	75m/250ft	75m/250ft	60m/200ft	90m/300ft	90m/300ft	90m/300ft	60m/200ft	60m/200ft	80m	200m	80m	100m/328ft	100m/328ft	100m/328ft
Dimensions (W x H x D)	87x136x111mm 3.5x 4x 4.4in	68x108x129mm 2.7x 4.3x 5.1in	68x108x129mm 2.7x 4.3x 5.1in	107x130x223mm 4.3x 5.2x 8.8in	81x47mm 3.2x 1.9in	86x179mm 3.3x 7.1in	86x179mm 3.3x 7.1in	N/A	80x110x140mm 3.1x 4.3x 5.5in	160x90mm	190x100mm	190x100mm	88x122x100mm 3.5x 4.8x 3.9in	88x122x100mm 3.5x 4.8x 3.9in	84x31x108.5mm 3.3x 1.2x 4.3in
Weight	660g/22.9oz	505g/17.7oz	505g/17.7oz	1780g/62.3oz	890g/31.4oz	1.13kg/2.5lb	1.13kg/2.5lb	39g	14.99 oz (427g) 2.7lb	990g	1430g	1360g	883g/20.9oz w/o Batteries	644g/19.2oz w/o Batteries	285g/10.1oz w/o Batteries
UV Weight	TBA	-10g/-0.4oz	-4g/-0.2oz	-80g/-2.8oz	Neutral in fresh water	Near Neutral in salt water	Near Neutral in salt water	N/A	Near Neutral in salt water	0g	-60g	-50g	77g/2.7oz w/o batteries	47g/1.7oz w/o batteries	65g/2.3oz w/o batteries
Other Features:	DS-TTL i/VEH+, Slave TTL, Light Level Control-11 steps, Preflash cancellation, Slave Function, Auto Power Off, Fiber Optic Cable Port, Sync Cord, LED Target Light, 3 diffusers, ball mount included	DS-TTL (Slave TTL), Light Level Control-10 steps, Preflash cancellation, Slave Function, Auto Power Off, Fiber Optic Cable Port, LED Target Light	DS-TTL (Slave TTL), Light Level Control-10 steps, Preflash cancellation, Slave Function, Auto Power Off, Fiber Optic Cable Port	DS-TTL (Slave TTL), Light Level Control-12 steps, Preflash Signals, Auto Power Off, Fiber Optic Cable Port, Sync Cord, LED Target Light	TTL mode compatible ballies TTL System (Slave optional), Light Level Control - 6 1/2 steps, Auto Pre-Flash setting/ no preflash, Slave Function Optional, Diffuser, Waterproof bulkhead cap	TTL mode compatible ballies TTL System (Slave optional), Manual Power mode-10 5 step increments, Auto Pre-Flash setting/ no preflash, Slave Function Optional, Diffuser, IC5 5-Pin Bulkhead, Li-Ion smart charger, 205 Lumen LED modulating Light, Waterproof bulkhead cap	TTL mode compatible ballies TTL System (Slave optional), Manual Power mode-10 5 step increments, Auto Pre-Flash setting/ no preflash, Diffuser, IC5 5-Pin Bulkhead, Li-Ion smart charger, 205 Lumen LED video light, Waterproof bulkhead cap	3 pre-flash modes, 3 power settings, diffusers to spread and control output	TTL/Manual/Auto/FP TTL auto FP manual Remote Control/Slave auto/Slave/Manual, Auto-focus (Remote) light, manual control power dial, last button, control pane for easy to see use, FP mode allows sync at high shutter speeds	6 manual power steps, ready-to-use warning, flash ready light, flash socket 1/8 OR 3/8, Spare Charging set and lubricant in neoprene bag, Diffuser, Macro red Light Filter, Snoot, Neoprene Cover and Neoprene Dome protection, Charging set with Lubriant, TTL cable, Wall Charger/TU Manual	TTTL/Manual, Spare Battery pack, Diffuser, Macro red Light Filter, Snoot, Neoprene Cover and Neoprene Dome protection, Charging set with Lubriant, TTL cable, Wall Charger/TU Manual	TTTL/Manual, Spare Battery pack, Diffuser, Neoprene Cover and Neoprene Dome protection, Charging set with Lubriant, TTL cable, Wall Charger	S-TTL Auto / External Auto / Manual / TTL Auto / Manual + TTL Auto, Wireless connection / Optical D Cable / Optical D Slave Cable / Electrical Cable, 13 steps in 1/2EV increments, 180 Lumen LED focus light, 6000K Temp, Sync condenser cap, slave sensor cap, Negative 5 White diffuser, 1/40 Filter L.E. Red	S-TTL Auto / External Auto / Manual / TTL Auto, Wireless connection / Optical D Cable / Optical D Slave Cable, 12 steps in 1/2EV increments, Negative 5 white diffuser, Magnet, Magnet Sore, Spare O-Ring, Wireless connection kit	S-TTL Auto / Manual / TTL Auto, Wireless connection / Optical D Cable / Optical D Slave Cable, 12 steps in 1/2EV increments, Negative 5 white diffuser, Magnet, Magnet Sore, Spare O-Ring, Wireless connection kit

OPTICAL OCEAN SALES Focus/Video Light Specifications Comparison Chart

UNDERWATER PHOTOGRAPHY EQUIPMENT

	Big Blue			I-Torch					UK	Ikelite	Light & Motion						
Product Name	AL380EO	AL3000P AL3000E	VXL280P	FishLife X24	Venusian II	Vites Pro 5+	Pro 5	Pro 7	UK Aquasoft	Vesa	Sola Photo 800	Sola Photo 3200	Sola 1200SE	Sola 2100SE	Sola 2800E	Sola 4000	Gobet 200 Lite
Price	\$89.95	\$199.99	\$429.99	\$499.00	\$205.00	\$204.99	\$699.00	\$999.00	\$249.99	\$500.00	\$499.00	\$699.00	\$699.00	\$899.00	\$799.00	\$1,099.00	\$299.00
Lumens	350	90 - level I 225 - level II 140 - level III level IV	Flood Beam Mode 250 - level I 425 - level II 1250 - level III 2800 - level IV Red Beam Mode, 500 Red Color Mode, 100	2400 0 modes White - 100%, 50%, 25% Red - 100%, 50%, 25%	800 3 Modes white, 100%, 50%, 1 Red, and SOB	1000 3 power settings	2400 Modes: 3x white 2 red, UV purple and SOB	4 modes Modes: 2x White, 2x Red	4 levels (Full, 1/2, 1/3, 1/6) 120-1000 Lumens	2000	High: 800 (50°) 500 (25°) Med: 400 (25°) Low: 200 (125)	High: 1200 (P/beam) / 300 (Head) Med: 600 (P/beam) / 150 (Head) Low: 300 (P/beam) / 75 (Head)	1200 (P/beam/Spot) High: 200-500 Med: 100-250 Low: 50-125	High: 2100 / 1200 Med: 1000 / 600 Low: 500 / 300	High: 2500 Med: 1250 Low: 625	Level I - 125 Level II - 250 Level III - 500 Level IV - 1000 Level V - 2000 Level VI - 3000 Level VII-4000	High-700 Med-325 Low-150
Depth	100m	100m	100m	100m	100m	100m	100m	100m	152m/500ft	90m/300ft	80°/120°	80°/120°	80°/120°	60°	90°	80°/90°	60°
Beam Angle	65°	XWP = 120° WP = 85°	120° Wide, 10° Narrow	110°	100°	110°	120°	120°	65° or 90°	65°	80°/120°	80°/120°	80°/120°	60°	90°	80°/90°	60°
Color Temp	8500K	6500K	6500K	4800	4800	4800	4800	4800	5000K	5700K	6500K	6000-6500K	6000-6500K	6000-6500K	6000-6500K	6000K	6000K
Size	4.75x1.75in	3.8 x 1.32 x 2.9in	5.5 x 1.4 x 6.9in	5x2in	5.75x1.5in	8x1.8in	4.7x1.31in	5.8x1.9in	12.7x3.81x3.81cm/5.1x1.5x1.5in	50x42mm (1.9x1.6in)	4x2.1x2.1in	4x2.1x2.2in	50x104mm	50x102mm	57x107mm	57x107mm	4.9x1.9x1.9in
Weight (w/ out water)	201 g out water / 118g in water including batteries	177g out water / 89g UW	461g out / 233g UW	110 w/battery	8oz w battery	12oz w/battery	300g(land)/150g(water)	612g(land)/250g(water)	8oz w/battery	11.2oz	244g	248g	254g	203g	269g	750g	180g
Mounts	Lanyard and Clip, other mounts sold separately	Clip, other mounts sold separately	Goodmanstyle joint, 1" ball joint	YS mount, Lanyard, optional ball mount	YS mount, optional Goodmanstyle glove	YS Mount	YS Mount	YS Mount	Two threaded holes to allow for to be adapted to most UW Arms	Lanyard	Ball, YS, Hand, video ballies nylon mounts sold separately	Ball, YS, Hand, video ballies nylon mounts sold separately	Ball, YS, Hand, video ballies nylon mounts sold separately	Ball, YS, Hand, video ballies nylon mounts sold separately	Ball, YS, Hand, video ballies nylon mounts sold separately	Ball, YS, Hand, video ballies nylon mounts sold separately	Ball mount, Lanyard, Head and Body, Spine caps
Run Time	4hrs	2hrs (level IV) 5hrs (level III) 10hrs (level II) 20hrs (level I)	1.5hrs (Level IV) 3hrs (Level III) 6hrs (Level II) 15 hrs (Level I)	55 min @ 100%	120 min @ 100%	1-3 hrs	60min at 100%	60min at 100%	1.3hrs at full, 8.8 hours at low	45min High-180min low	High-70 min Med-140 min Low-280min	High - 70 min Med - 140 min Low - 280 min	High-70/110 min Med-140/220min Low-280/440min	High-80 min Med-120 min Low-240 min	High-60 min Med-120 min Low-240 min	Level I - Level II: 800 min Level III 480 min Level IV: 240 mins Level V - 120 mins Level VI - 90 mins Level VII - 60 mins	High - 1.5 hrs Med - 3 hrs Low - 1.5 hrs
Type of Charger	N/A	Wall Charger	Wall Charger	SodaCharger	SodaCharger	SodaCharger	SodaCharger	SodaCharger	SodaCharger, USB charger	Wall charger/Beated, Charges through handle knob	External port for SodaCharger	External port for SodaCharger	External port for SodaCharger	External port for SodaCharger	External port for SodaCharger	External port for SodaCharger	Micro-USB
Charge Time from fully (Recharged state)	N/A	70 mins	30 mins	30 mins	70 mins	70 mins	70 mins	80 mins	70 mins	180 mins	150min	150min	150min	150min	150min	150min	4.5hrs
Batteries	3xAAA alkaline or Ni-NiH	Li Ion Recharge Battery	Li Ion Recharge Battery	Li-Ion Rechargeable Battery + 2 included	Li-Ion Rechargeable Battery + 2	2 Li-Ion Rechargeable Batteries + 2 included	2x5000mAh	Rechargeable Lithium	Li-Ion Recharge Battery	Rechargeable	Li-Ion Rechargeable	Li-Ion Rechargeable	Li-Ion Rechargeable	Li-Ion Rechargeable	Li-Ion Rechargeable	Li-Ion Rechargeable	Li-Ion Rechargeable
Filters	Removable Red and Yellow	Removable Red and Yellow	Removable Yellow and Built in Red	Red built in	Red Built in	Red and Purple	Red Built in	Red Built in			Red Built in	Red Built in					Optional red head
Other Features:	Automatic Flash off function	Battery level indicator Blue, Green, Flashing Red, SOB Flashing	Battery level indicator Blue, Green, Flashing Red	Push Button: half press switch between power/light setting	Push Button with Battery indicator	Push Button with Battery indicator	Push button with battery indicator	Push button with battery indicator	Back up battery	Has a light indicator to show charge or battery life	Colored Battery Level Indicator, Slide allows for lens to switch quality between cover levels	Colored Battery Level Indicator, Slide allows for lens to switch quality between cover levels	Colored Battery Level Indicator, Slide allows for lens to switch quality between cover levels	Colored Battery Level Indicator, Slide allows for lens to switch quality between cover levels	Colored Battery Level Indicator, Slide allows for lens to switch quality between cover levels	Colored Battery Level Indicator, Slide allows for lens to switch quality between cover levels	Battery level indicator, 3 power levels, SOB feature and Extended run time setting, Interchangeable head for red

Pacific Northwest Diver: Our Team

The Pacific Northwest is a large, diverse region with diverse interests in underwater photography and videography. In order to make it easier for you to submit information about critters, photographers, dive clubs, and operators/resorts in your area we have several key contacts. Since we are all volunteering our time and efforts, we also hope to spread the work-load so we will all have ample time for diving and photography!

Below are our contacts, please either get in touch with one of the regional contacts listed below, or contact editor [Dan Clements](#) directly.

Marli Wakeling



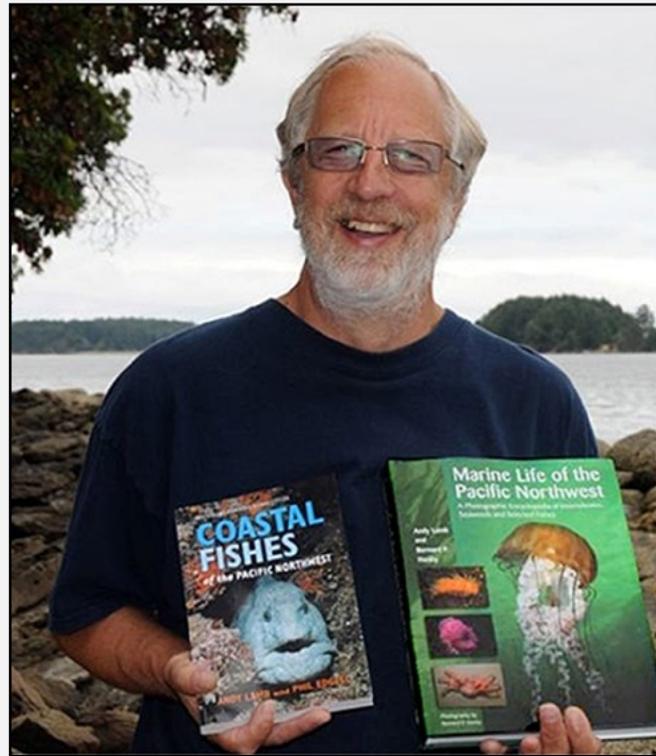
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