

Secrets of the Forest

by Tom Burd

You never really know what you will stumble upon during a walk in the forest, but I certainly wasn't expecting to find myself snorkelling in an oversized puddle, mesmerised by an extraordinary little semi-aquatic animal. It wasn't until I had hiked up to the remote waterfall with wetsuit, weights and photography gear, that my camera unfortunately decided to give up the ghost, so the project came to a sudden halt. However a year later, properly equipped and with fresh ideas, I've been lucky enough to have another go at highlighting the fascinating life story of a very charismatic amphibian: the fire salamander!

The Grésigne forest in the South-West of France stretches across nearly 9000 acres and is part of the European Commission's "Natura 2000" network, thanks to its ecological importance as a wildlife refuge for a multitude of fauna and flora. Deer, pine marten, wild boar and a uniquely high diversity of insects are just some of the inhabitants found throughout this beautiful landscape. It also appears that the combination of dense leaf litter, abundant moss and the network of interconnecting

streams found here, provides an ideal habitat for both life stages of the fire salamander (*Salamandra salamandra*). The adults are completely terrestrial (they're actually terrible swimmers!) and are primarily nocturnal, preferring to take refuge under moist dark cover during the day in order to avoid desiccation. These voracious hunters actively stalk the forest at night, devouring a variety of insects such as silkworms, spiders and slugs. In order to avoid predation, fire salamanders secrete a potent neurotoxic mucus from a pair of Parotoid glands situated below the neck, in addition to displaying bright orange or yellow warning patches across their bodies. This flamboyant colouration is actually where the species gets its name from, as they were commonly seen escaping from burning logs

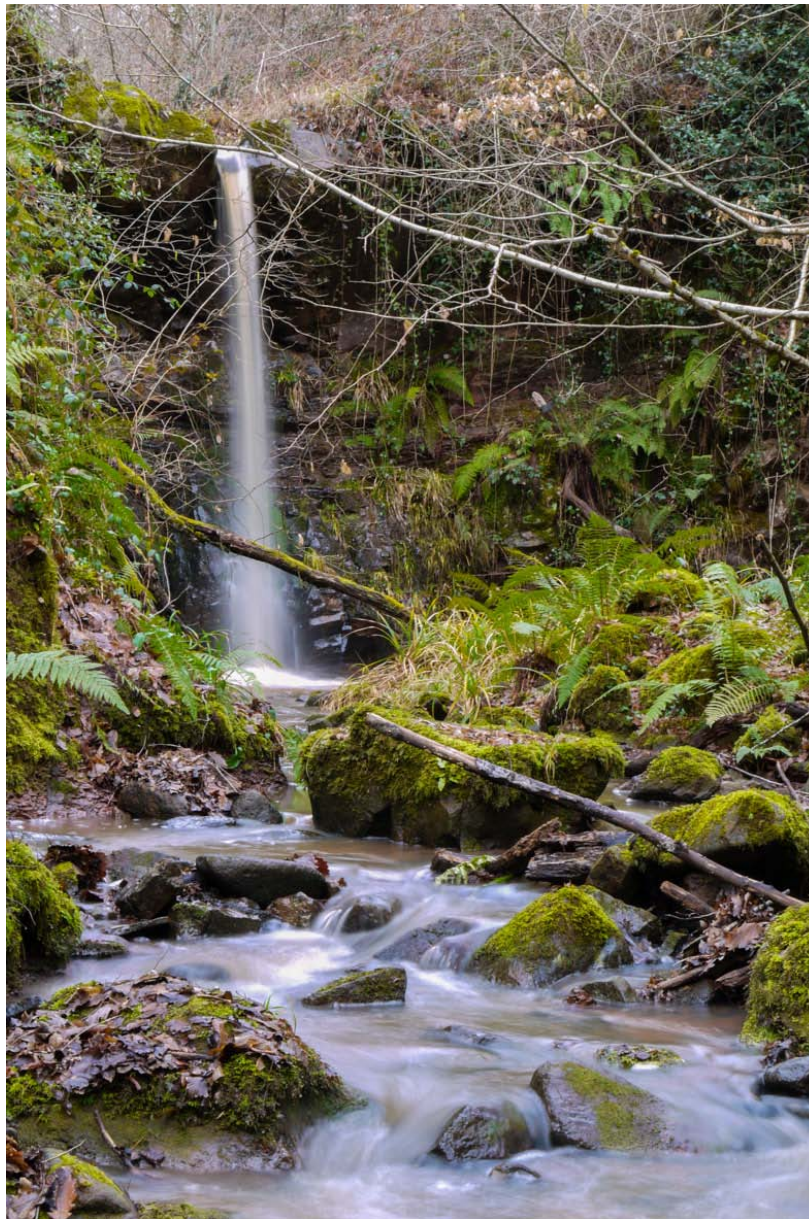
No decompression stops or currents to worry about here! LG G3, f2.4, 1/20, ISO 50.

The true magic of these little creatures is only apparent close up. Nikon D7000, Nauticam Housing, Nikon 60mm Micro, 1x Sea and Sea YS-D1, homemade snoot, f27, 1/250, ISO 160.

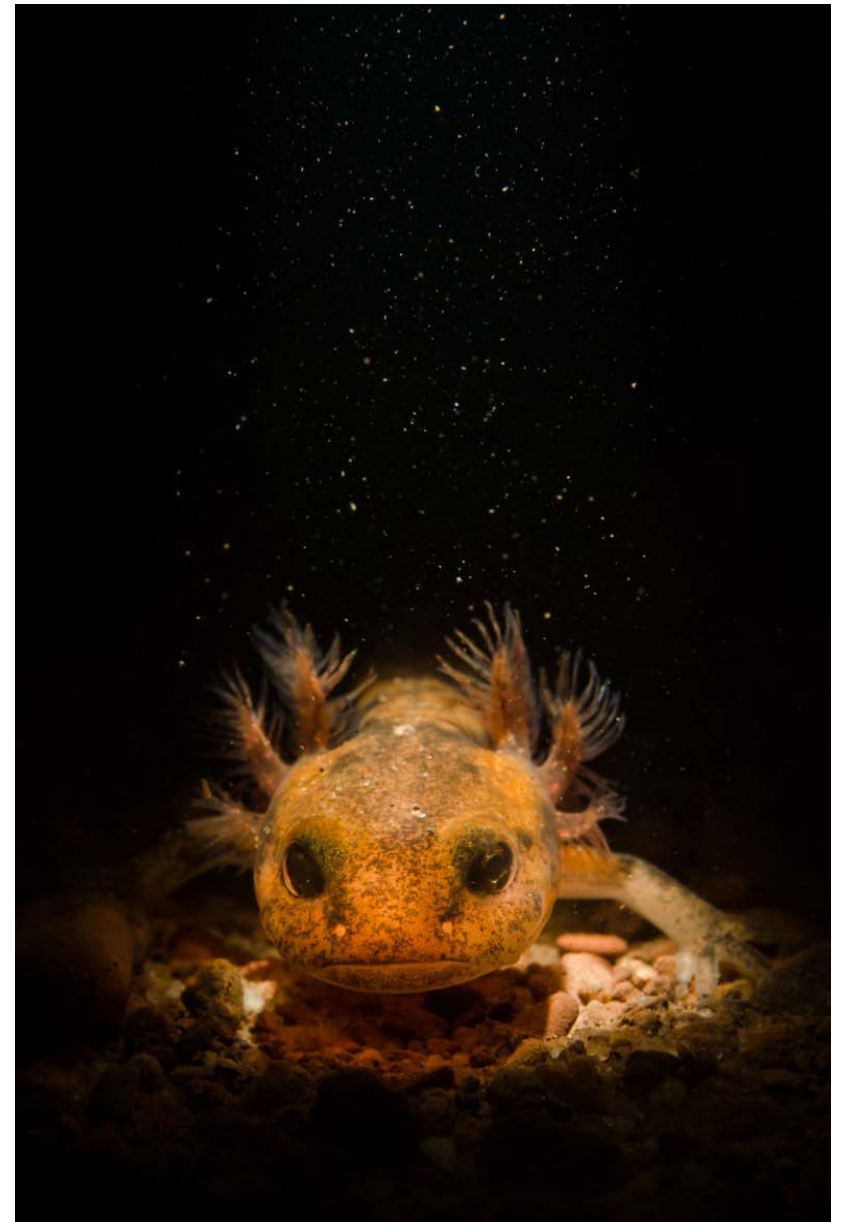


inadvertently placed on the fire! Unfortunately, instead of household fires, they are now threatened by an invasive pathogenic fungus called Bsal, which has caused large scale mortalities across certain parts of Europe. The fungus was introduced from Asia through the amphibian pet trade and is considered a severe threat to multiple species, so I was extremely lucky to find such a large breeding population on my doorstep.

During the mating season males transfer a sperm packet, called a spermatophore, to a female who subsequently fertilises her eggs internally. During early spring, she will then travel to a water-body to lay the eggs, which immediately hatch into larvae (a process called ovoviviparity). A few sub-species of fire salamander actually exhibit live birth of well-developed larvae instead, called viviparity. At this point they are left to fend for themselves, but differ greatly from their parents in that they possess external gills protruding from the neck! For two to three months



During early spring high rainfall restricts visibility at the waterfall, but looks beautiful. Panasonic Lumix DMC-GF1, Lumix 14-45mm at 38mm, f22, 0.8 sec, ISO 100.



Centre stage for this young fire salamander! The snoot was key to this type of shot. Nikon D7000, Nauticam Housing, Nikon 60mm Micro, 1x Sea and Sea YS-D1, homemade snoot, f27, 1/250, ISO 200.



A cheeky smile from a salamander, just before my camera broke in the first year... Nikon D7000, Nauticam Housing, Nikon 60mm Micro, 1x Sea and Sea YS-D1, f22, 1/125, ISO 500.

they grow up in the water, absorbing dissolved oxygen and surviving on small invertebrates. (At this time of year the water flow from the waterfall is minimal, providing a stable habitat for the juveniles and allowing me to spot them!) Metamorphosis gradually occurs and the gills recede to be replaced by fully functioning internal lungs, which allow the adults to breathe on land. At this stage other changes also happen, such as a thickening of the skin, the formation of eyelids and sexual maturation.

During my time in the water I noticed a mixture of juveniles and quasi-adults, with the latter featuring much stronger fiery-orange patterns and almost no gills. These were often found breathing at the surface and were even more skittish to approach than the younger ones! Every single individual was completely unique, with different colour tones or skin patterns, as you can see in the photos.

I wanted to use a photographic technique which eliminated the ugly reddish-brown sediment in the



The younger larvae are transparent to some degree, allowing this backlighting to glow through. Nikon D7000, Nauticam Housing, Nikon 60mm Micro, 1x Sea and Sea YS-D1, homemade snoot, f27, 1/250, ISO 200.

background, whilst emphasising the incredible gill structure of the larvae. Having read about “snoots” in the past, they seemed to be perfect for the job: reducing the coverage of the flash to create a thin, directional beam of light. This would highlight only a small portion of the animal, picking up the gill filaments and providing a pleasing black background. However, not wanting to sell my soul to pay for a commercial snoot, I decided it was time for a bit of DIY. Drum roll please for... the baked bean tin! Luckily

enough it turns out that a tin of (French) baked beans exactly matches the diameter of a Sea and Sea YSD1 strobe head. Being metallic, and hence reflective inside, also meant that less light would be lost from absorption into the material. After reading up on the subject (a special thanks to Keri Wilk for all of the pioneering information he has published on the topic), I drilled a hole into the end of the tin and inserted a plastic pipe, 1cm in diameter and 15cm in length. A few strips of Gaffa tape later (the solution



As the larvae metamorphose, their colorations become more prominent and the gills disappear. Nikon D7000, Nauticam Housing, Nikon 60mm Micro, 1x Sea and Sea YS-D1, homemade snoot, f27, 1/250, ISO 160.

to most of life's problems), and I had something that resembled a functional snoot! Test shots revealed that it created a light beam roughly 3cm wide when placing the strobe about 20cm from the subject; this would just cover the width of a salamander head.

The second decision was whether to mount the strobe on a tripod or directly onto the camera housing. Considering the shallow depth of water in the waterfall basin and wanting to try a few different lighting angles, I decided to go for the flexibility of a tripod. Combining a modified triple clamp and three strobe arms did the job perfectly. This would allow me to find a salamander, position the strobe, and then take a few test shots whilst maintaining a good distance from the subject. When the lighting was right, I could slowly move in and adjust my composition freely for the final picture.



Baked bean can snoot ready to be attached to the strobe. LG G3, f2.4, 1/20, ISO 100.

Modifying the rings of the triple clamp allow the tripod legs to be positioned vertically and obtain a higher position over the subject. LG G3, f2.4, 1/40

Three strobe arms and a triple clamp make a good tripod, if a little awkward to adjust underwater. LG G3, f2.4, 1/60, ISO 50.

Of course this technique sounded far simpler in my mind than it turned out to be, even after practicing first in the swimming pool! Floating in a tiny basin of water less than 1m deep, whilst trying not to stir up sediment or scare away the salamanders, proved to be a hefty challenge. They were very sensitive to any vibrations and were often just downright uncooperative, moving position as soon as the lighting was set up. It also didn't help that I was sharing the pool with a little grass snake, which swam around scaring the salamanders into hiding! With a bit of perseverance and adaptation, the technique was refined over a few days and I





A prime adult specimen released after turning up on our mop head, displaying prominent defensive colours! LG G3, f2.4, 1/30, ISO 50

learnt valuable lessons about planning for the shot, as well as the technical aspects of this type of photography.

There is currently an ongoing discussion within the photographic community regarding our interaction with wildlife and the environmental considerations to take into account when participating in this hobby. The obvious issues have already been greatly discussed, such as critter manipulation and poor buoyancy control, but there are still a few less talked about topics - pollutants being one of them. Entering a tiny pool

of water full of fragile inhabitants, I felt acutely aware of my potential impact on the surrounding ecosystem (especially considering that 1/3 of all amphibians are considered threatened or extinct in the wild, a terrifying number!).

Due to the high permeability of their skin they are extremely sensitive to environmental changes and one cause for their rapid decline is the introduction of man-made contaminants into the environment. Fire salamanders are therefore a good species to champion the subject of

chemical pollution, but the following can also be applied to many other animals and habitats. If not naturally biodegradable, most of the products which we use on our bodies or equipment will probably impact a given ecosystem at some level (often in combination with other stressors).

Think about sun cream, talc power for dry suit entry, detergents for scrubbing down boat decks; there is little environmental testing on the trace effects of many of these products. Until not long ago we had no idea that Oxybenzone is highly toxic to corals, being just one chemical contained within the millions of litres of sun cream which enter the oceans every year. Finding out too late about these harmful effects has become a sad trend and we need to be more proactive about mitigating harm.

Now I'm not saying that on your next liveaboard trip you should leave the deodorant at home (as you might not be the most popular person onboard!), however there are bio-degradable alternatives for all of these products. Consider splashing out on a reef-friendly sun cream, spit in your mask instead of rinsing with baby conditioner and use a bio washing-up liquid for slipping into that freediving suit! Millions of divers enter the water each year, so we do have a responsibility to be cautious about the

products that we use, no matter how trivial or inconvenient this may sound.

It was very fulfilling to spend time in the water observing such bizarre but beautiful little beings. When looking through a macro lens at a fire salamander you are instantly transported into the realm of a seemingly long-lost mythical creature. I'm adamant that they were the source of inspiration for Toothless the dragon, in Dreamwork's animation film "How to Train your Dragon"! (If you won't admit to having watched the film, have a quick Google to see what I mean.)

The next step of this adventure will be to witness the birthing process and better document the gradual metamorphosis to adulthood. Thankfully I have another year before the breeding season starts again - should be plenty of time to figure out how on earth to do it!

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