

Aquarium Photography Part 1

I was sitting around admiring the photo contest pictures one evening and commenting to myself that we really have a club that is into photographing their fish. I have been into and around photography for most of my life. My father was an avid picture taker and I caught the bug at an early age. So I thought a series on photography and digital cameras and workflow could be of interest to the club. I asked Robert if this would be of interest to him for the Lateral Line and he said it was a great idea. This will be the first of about 4 articles. In addition, the series could very well continue if there was a demand for more advanced topics. This first one will be a basic introduction to the wonderful world of photography. Many of the principles and thoughts will apply to everyday picture taking, but I will be focusing on our particular passion..FISH!

When it comes to aquatic photography there are 2 basic rules I like to preach. First, know your equipment, and second, to know your fish. The first article will focus primarily on the first part. I will address the second part in another article of the series when I discuss setting up and doing a photo session of your fish.

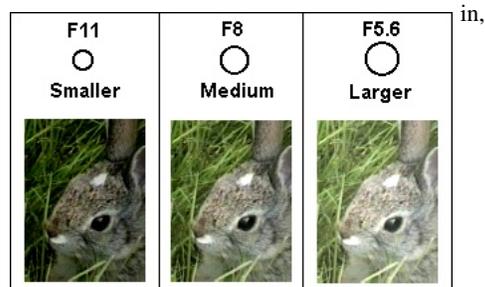
Whether you use a point and click or a DSLR, there are principles that apply at all times. Photography is all about light and knowing your lighting conditions when trying to achieve a properly exposed image. Unfortunately, most people put their camera on auto and fire away and this takes having to learn how film speed, aperture, and shutter speed relate to each other. Of these subjects aperture and shutter speed are the most important. First let's define aperture. The aperture is an opening that changes in size to admit more or less light (similar to the iris of an eye). The numbers on the aperture control are called F-stops and referred to as F16, F11, F8, and so on.

The larger the f-stop numbers the smaller the opening. In addition, each number higher lets in half as much light as one number lower. Here is an example.

An aperture of F5.6 admits twice as much light as F8, while F11 lets in only half as much.

But, aperture doesn't work alone when determining the exposure. Shutter speed plays a large part as well. The shutter speed determines how long the shutter is open thus how much light is reaching the sensor through a given aperture. What does all this mean and how does it work, especially relating to fish photography. Many different combination of setting can be used to achieve the same exposure. The key-determining factor is what effect you are trying to achieve. Here just one example.

Let's analyze this a bit. An aperture of F22 has a very small opening thus not much light is getting



in, therefore you have a slow shutter speed. Now at the other end with an aperture of F5.6, which is a much wider opening, you get a fast shutter speed of 1/500 which is great when you are trying to freeze your subject. This is great when snapping shots of our fast moving fish. As a side note, most of my fish pictures are taken with a 50mm 1.8 prime lens. An f-stop of 1 is the widest opening you can

Aquarium Photography Part 1

achieve, so you can see a 1.8 is pretty wide and is great for low light conditions or achieving fast shutter speeds. Shutter speeds play another important role when it comes to taking our pictures. Lenses come in all sorts of focal lengths. Zoom lenses are very popular because they cover a wide range of focal lengths and are very versatile. When you start

Aperture	F22	F16	F11	F8	F5.6
Shutter	1/30	1/60	1/125	1/250	1/500

to get into longer focal lengths camera shake starts to become a factor. The basic rule for handholding is the shutter speed is about 1/focal length. So if you are using a lens at 300mm, about the slowest speed you could hand hold at is about 1/300. Anything slower than that and it would be wise to use either a monopod or tripod to keep the camera steady. This is just a general rule. Some people are steadier than others. So if you are using a 300mm lens and you have an aperture of f22, it would be very tough to get a clear shot with a 1/30 shutter speed. For the most part when taking pictures of fish we want clear stop action photos. So your choices are either high shutter speeds or a lot of light.

You can cheat a little bit by changing the ISO setting of your camera. This is basically film speed. You can gain f-stops by using faster settings. An ISO of 100 is slow while 1600 and 3200 would be very fast. Take a given lighting condition. You want to use an f-stop of f8 and a shutter speed of 1/125. At ISO 100 maybe the exposure is fine, but the shutter speed is a little slow and you can see motion blur in the picture. Kick the ISO up to 400 and now you can get that shutter speed up to 1/250 and the fish is perfectly froze. Well, that is great you say, I will

just use a high ISO setting all the time. It doesn't quite work that way. In digital cameras, higher ISO speeds start to introduce digital noise into the picture, which isn't a desirable affect. There are ways around it and that will be discussed in a later article when we talk about the post-processing of pictures. I recommend that you use as low an ISO as the conditions allow. The DSLR's do a wonderful job at keeping the noise to a minimum, but it is something to be aware of anyway. Hopefully now you can see the relationship that aperture, shutter speed, and ISO share with each other.

The next area is more of a compositional subject and it involves Depth-of-field(DOF) DOF is the area or "zone" of a photograph, from front to back, that is in focus. 3 items affect this. These are the focal length of the lens, distance of subject from background, and the aperture of the lens. Let's tackle each part separately. First, we will discuss the focal length. The depth of field is inversely proportional to the focal length of the lens; that is, the smaller the focal length number of the lens, the greater the depth of field. For example, a 28mm lens has the ability to capture more of the picture in sharp focus than a 100mm lens. Next, is the distance of the subject from the background. Depth of field is directly proportional to distance; for example, a subject at a greater distance will have greater depth of field than a close-up subject. Therefore, you need not worry as much about a distant subject being out of focus. This one isn't as big a factor for us, because our subject is confined in a limited space and you will be in the area of the tanks. Finally, is the aperture of the lens. Normally changing the aperture will not have a huge effect on the depth of field for a distant subject or a wide-angle lens. But fortunately for us it can make a big deal

Aquarium Photography Part 1

of difference in a close-up or a photo taken using a telephoto or zoom lens. A wider aperture (small f-stop number) will result in a shallower depth of field. You can use this to keep either the foreground or background out of focus while maintaining the subject in focus. When changing the aperture setting, you will need to also adjust the shutter to maintain the correct exposure. After awhile you can get a good feel for DOF, but for those who desire there are all sorts of DOF calculators you can find online. I have included 2 pictures to show an example. In the photo I took below I have a very shallow depth of field. The subject is sharp and the background is out of focus, even though only a few inches separated the two.

front to back.



Photo by Diane Tennison

Now the picture taken below by Diane Tennison has a much deeper DOF. Everything is in focus from

Neither one is right or wrong. It is the photographer's interpretation of what they are trying to accomplish.



Photo by Dave Hansen

That covers some of the basics and understanding these is important to getting the most from your pictures. Thankfully, today's camera's make this much easier than in the past. You can choose to concentrate on one part of the equation and let the camera help you out with the others. Next month, we will discuss all the options you have for cameras, lenses, and flashes (and other external light sources). I will try and give you all the pros and cons and aid you in making a decision on what is the best setup for you. We will follow that up with setting up and executing a photo session, and finally an article involving the post-processing of your images and the various tools that can be used.

■ *Dave Hansen*