MACRO WORKSHOP

by Jim Leary

You have probably downloaded this file because you attended my workshop on Macro Photography. I hope you enjoyed the presentation and were able to take something away from it to help you in this area of photography. Here are some notes that were presented in the program.

Why do they call it Macro if it relates to taking photos of small items???

- Micro Photography is a term used for taking photos of extremely small objects. It usually requires photo-microscope equipment and is used in the sciences.
- Macro Photography is called Macro because the final photo or file is depicting the subject “Larger than Life”.
- It is also referred to as close-up photography, since it usually requires us to get very close to the subject.
- This can require special equipment and techniques that we will discuss in the following content.

EQUIPMENT

Camera body:

Most DSLR cameras will work fine. Focusing is critical, so it is nice to have an optical viewfinder or a very good quality electronic viewfinder.

Some welcome features on the DSLR:

Mirror lock-up: a feature that allows the mirror in the pentaprism to lock in the up position before the shutter fires. This helps reduce vibration, a desired feature in a high magnification shot.

Live View: allows you to see the image in the rear LCD Screen instead of the viewfinder. Many cameras allow for magnification of that image. This can aide in focus.

DOF Preview: the depth of field preview button allows you to see the actual depth of field at a particular f/stop. When you normally look through the viewfinder you are looking at the wide open aperture. When you fire the shutter the

diaphragm closes down to the set f/stop just before the shutter opens. So when the DOF button is not pushed you are not seeing the actual depth of field you set.

Manual camera control: Macro or closeup photography can confuse the auto functions of a camera. This can result in photos that do not have the desired results. Knowing how to set the manual functions on the camera to provide the desired results will help.

Manual Focus: In closeup photography the depth of field in very narrow and most of the time the autofocus of the camera wants to focus on a general area of the photo. This usually does not correspond to the eye of a butterfly or the center of a flower. Using manual focus gives you the ability for focus on the desired area of the subject.

LENSES and ADAPTERS

MACRO LENS

This is my first choice. It can be rather expensive, but it offers the best quality for close-ups.

- Many zoom lenses have a macro focus feature that lets you focus closer than a zoom lens without that feature, but they are not true macro lenses. What make a lens a “True Macro Lens”?

A true macro lens is a prime lens that has a longer focusing helical. Its optics are designed to be truly linear, it has very little chromatic abrasion, even at higher f-stops. It’s best optical quality is in the close range. Many can focus to a 1:1 magnification ratio with no attachments.

EXTENSION TUBES

- They are spacers that go between the camera and the lens. This allows the lens to focus much closer than normal. The tubes have no optical elements.
- Pros: retain good optical quality of lens. They are offered in sets of three different sizes to give magnification options. Can be combined.

Cons: reduce the amount of light hitting the sensor. AF might not work. Can cost around $200.00. Infinity focus in not possible.

CLOSE-UP FILTERS

- Look like a regular screw on filter. They are sort of like the reading glasses you can buy at the drug store. Usually comes in a set of three diopters. Can be combined for higher magnification.
- They are inexpensive, and help you get closer to your subject, but they are not the best optical choice. There is no infinity focus.
- Advantages: cheap way to explore close-up photography. There is no light loss.

BELLOWS

- This also acts as a spacer between the camera and the lens. Bellows allow variable magnification. Some will allow up to 10x life size.
- Cons: very expensive. Do not allow electronic interface between camera and lens. At high magnification, you need a ton of light and you have almost no DOF. This is not the bellows fault. Any means for high magnification will have a very shallow depth of field.

REVERSED LENS

- By using a special adapter, you can reverse the lens and increase magnification.
- Manual rings are inexpensive, but offer no auto functions. Have to be used with older manual lenses.
- Auto rings can cost from $200.00 - $600.00.

TRIPOD

- Due to the high magnification used in macro photography, I believe a tripod is mandatory for tack sharp photos.
- Image stabilization might help with some camera shake, but it cannot help in holding steady for the shallow depth of field you will encounter.
- Make sure the tripod and head are designed to hold the weight of your heaviest camera/body combination.
- A tripod for outdoor macro use should be sturdy, yet light.
- The leg angle should have several adjustments, so the tripod can get close to the ground.

- The center column should be removable or adjustable.

TRIPOD HEAD

- Ball heads are very popular for macro use due to their adjustability and relatively small size. The small size is an advantage when you want to get low and close.
- Again, they should be able to hold your heaviest camera/lens combination.
- A quick release platform makes camera changes easy.
- Its controls should be easy to use and smooth.

REMOTES

- At high magnification you do not want to handle the camera to fire the shot.
- There are a few kind of remotes that are popular

  Wired, Infrared, and Radio
- Some remotes just fire the shutter. More sophisticated one can have several functions.
- When a remote is not available use your camera's timer.

CUSTOM SETTINGS

- In Canon they are called Custom Controls, the 5d series has C1, C2, C3
- I program my camera to lock up the mirror, set the f/stop and etc. C1 is set for f/8. C2 is for f/11 and C3 is for f/16. This way I will not forget an important setting when I am in the field.
- I am not aware of anything this robust in Nikon, but you can set up "MyMenu" and quick access it through the **fn** button.

MAGNIFICATION RATIOS

- This is the ratio of size between the subject and the sensor or film.
- Ratios were used allot more in the film days. They are important to calculate proper exposures. Today we have, auto exposure, histograms and immediate feedback to help here.
- The width of a full frame sensor is about 1.5". An APC Sensor is about .9"

- If the composition is 1.5”, we have a 1:1 magnification ratio in a full frame camera. If the composition is .9” we will have a 1: 1 magnification ratio in an APC size sensor.

LIGHT FALL OFF

- Anything that spaces the lens from the camera will reduce the light hitting the sensor.
- This even includes the long focus helical in a macro lens.
- This also equates to magnification ratio. As we increase magnification of a macro lens, bellows or extension tube, light hitting the sensor will lesson.

Light fall off at Various Magnification Ratios

Magnification	1:5	1:3	1:2	1:1
Aperture Correction	+.5 Stops	+1.0 Stops	+1.5 Stops	+2 Stops

LIGHTING

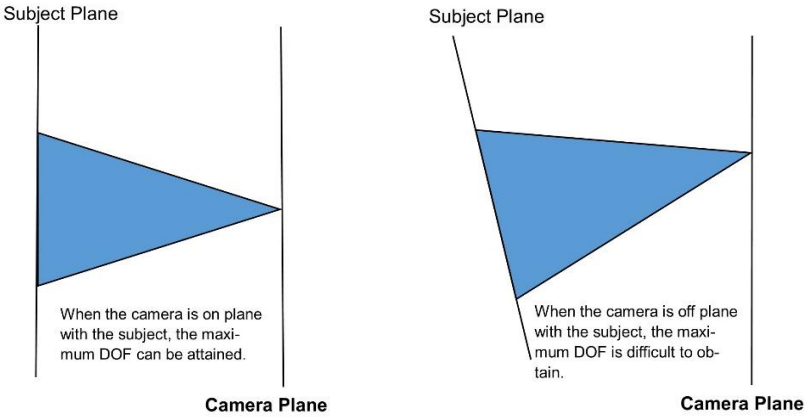
- Shoe mounted strobes are not the way to go. They tend to shoot over small subjects unless you use some kind of light modifier to redirect the light beams.
- Off camera strobes allow you to direct the light where needed.
- Ring lights work. They are fine for technical or scientific work, but they can be limited for more creative work.
- Studio lighting can be used.
- Light modifiers can be used to soften, and shape light.
- Light tents are great for even lighting on small subject and as an added feature they provide a uncluttered background and wind protection.

MACRO LIGHTING

- Use enough light to cover light fall-off from close-up lenses.
- Use enough light to keep the ISO low.
- Treat your small subjects to the same rules for lighting larger objects.
- I treat most of my flower photos as portraits. I often use main lights, fill lights and background lights.
- Use reflectors and scrims as necessary.
- Know your subject. If a flower has transparent petals, light the flower to bring out those features.

FOCUS TIPS

- Camera on plane with subjects for maximum DOF.



- Focus Choices:

  Do you want to Maximize focus?

  Or use Selective focus?

- Use Live View and use the magnification functions of Live View.
- Use manual focus. You can then make the decision on what parts of your subject you want in focus.

- Use the DOF preview button so you know what will be in focus at a particular f/stop.
- If you use your focus barrel to adjust your focus at magnifications higher than ½ life-size the magnification ratio will drastically change.
- To keep your desired magnification, you must focus by moving your camera in and out, and not the focus barrel. That is why I have a focus rail. It can move the camera in very small increments.

FOCUS STACKING

- A means to extend the normal DOF in an image by taking several photos of the same subject at varying focus points. A stacking program, like Helicon, Zerene or Photo Shop, then assembles the data by taking the sharpest points from each photo and compiling them into one final image.

FOCUS STACKING IN PHOTOSHOP

- In LR highlight the photos you want in your stack. In LR select the “Photo” pull down menu, and select Edit In, “Open as layers in Photoshop”.
- In Photoshop, select all layers imported. Go to the “Edit” Pull down menu, and select “Auto Align layers”.
- Then in the “Edit” pull down select “Auto Blend Layers”, and choose “Stack Images”.
- When complete “Save” the image. It will now be saved in your LR file.

CONTROL BACKGROUNDS

- Carefully compose the subject to eliminate distractions
- Control depth of field to bring out a sharp and detailed main subject and soften areas of less interest.
- Control with lighting – the main subject should be properly exposed and show good modeling. The background and unwanted details should be at a lower EV level so the eyes will go to the main subject.
- Control with post processing

    Desaturate and adjust luminance

    Darken or raise black level

    Selective blur

WILDFLOWER SHOOTING TIPS

Timing is everything. Every year is different. Get out early and got to your favorite places. Early flowers include Bloodroot, Spring Beauties, Snowdrops. They are followed by Dutchman's Breeches, Hepatica, Trout Lilly, and Trillium. Wildflowers do not last that long, and they can peak quickly. Some flowers like the Trout Lily and Jack in the pulpit should be shot looking upward to get a good view.

Morning and late afternoon light is best. Mornings are usually less windy. Mid-afternoon light is usually too contrasty. Look for the best subjects, and good arrangements. When possible include interesting environments.

When you find a good subject, walk around the subject to get the best angle and lighting. When doing this get down to the subject's level. Try not to shoot down on the small subject, get into it's world. When you are satisfied set up the camera and tripod for that view.

Soft even lighting is best. Take a couple test shots to see if there are high contrast areas in the frame. Use scrims or diffusers to eliminate the problem contrast areas.

Wind, even a breeze can cause unwanted motion in a delicate wildflower. Use wind blocks, light tents to help in this area. Sometimes you can clamp the stem to steady the subject.

Make sure your background does not interfere. Look for juxtapositions with your subject. Make sure the background is not busy or overly bright. Adjust the aperture so your subject is sharp, and the background is softer or even out of focus. It is easy to overlook these items when you are concentrating to control your main subject.

Dress accordingly. You will spend allot of time on damp ground. I have a lightweight pair of Gortex pants for this. You could always lay down a plastic trash bag to sit on. Knee pads can also make things more comfortable. Use some lightweight hiking boots. Springtime can be kind of muddy. Do not use sunglasses, especially polaroid ones. They will hinder your ability to realize contrasty situations.

TELECONVERTERS

- They are a spacer with optics.
- They will convert a lens to a longer focal length, while maintaining the close focus distance. A 300mm lens with a 1.4 teleconverter will now be 420mm. It will still have a close focus distance of 5 feet.

- There is light fall off. 1.4X converter will have a 1 stop loss. A 2X converter will have a 2 stop loss. AF might suffer. Many cameras will not autofocus properly past f/5.6. Some of the newer upper end camera can auto focus at f/8.

?? WHATS IN THE BAG ??

- Camera body, Canon 5D MkIII
- Canon 100mm Macro Lens
- Canon 300mm Telephoto
- Canon 1.4 Teleconverter
- Infra-Red and Electronic Remotes
- Gitzo tripod and RRS ball head
- RRS Macro Rail
- Metz Strobe
- Off Camera Strobe Cable
- GPS
- Gray Card, 18% Gray
- Black Card
- Gortex Pants
- Headlamp
- Trash Bag
- Camera Cover
- Microfiber Towel
- Lens Cleaning Kit
- Bug Repellent
- Handkerchief and Rubber bands
- Wire and Clothes Pins
- Notebook

Macrophotography can be enjoyed with minimum equipment and resources. Subjects can be varied and cover many interest. Following some proven techniques can result in some very professional photos.