



Macro Photography

A Little Bit Closer

Greg Carlill

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What is Macro Photography

- The classical definition of Macro Photography is where the subject is represented 1:1 on the film or sensor.
- Macro is often called Close-up Photography.



Lenses and flashes associated with Macro Photography

- A Macro Lens is one that has the ability to reproduce the subject at 1:1.
- Some zoom lenses as have a Macro designation.
- Some super-telephoto lens are also good for Macro.

Lenses

- If buying your first Macro lens I recommend that you start at shorter focal lengths as this will make the learning curve simpler, especially on a crop body. That is don't start out with a 150mm or a 180mm macro lens. The focal length around 100mm is the best place to start and there are lots of options from many manufacturers at this focal length, all have great reviews.
- Also, if shooting with Canon, don't jump straight for a MP-E 65mm as this is a very specialised macro lens. Techniques learnt with lenses around 100mm in length will be useful if you do ever get a MP-E 65.

Canon EF 100mm F2.8 USM Macro

- A wonderful lens that I would recommend if you are starting or a little more experienced.
- This focal length is extremely useful for a variety of subjects. Used with Extension Tubes you can get closer to smaller insects and flowers and alone it is great for dragonflies and bigger subjects.
- It has an in-built ring to accept both the MR-14 and MT-24 Macro Flashes. The focus mechanism is totally internal so the front element of the lens doesn't extend as you focus.
- The USM focus motor in this lens makes it a quicker to focus than most other Macro Lenses on the market. This combines well with the full time manual focus.

Canon 180mm L F3.5 Macro

- My favorite Macro Lens. It's big, heavier than the 100mm but produces such wonderful shots. I mostly use it with the MT-24 Twin Light. The longer focal lengths means you can be a little further away from the subject and not spook them. In simple terms, the backgrounds with the 180 look better than with short focal length Macro lenses. The Canon 180mm Macro has an internal focus design so the lens doesn't extend as you focus.
- I've come to the conclusion that there are certain types of subjects that it's more suited too. These are the larger subjects like Dragonflies and Butterflies and then shot from a little further away, but then that's what you buy a longer macro lens for isn't it - working distance.
- When I use it on smaller subjects I tend to want to fill the frame as much as possible but the working distance of the lens works against you here. You can only get to about 48cm from the subject and smaller insects don't fill much of the frame at this distance. My first thought is to chuck on a set of tubes to reduce the working distance and this works well, I can fill the frame a little more. With this setup the Magnification is about 1.6x.
- I've also added a 1.4 teleconverter to this setup and this then gives me about 2.2x magnification. I've only worked with the a few times but have got some reasonable results. Trouble is the size of this combo is very large and gets even heavier when you place a MR-14 or MT-24 on the end.
- To use the MT-24 or MR-14 with a 180 you need the Canon 72C Macrolite Adapter. This screws to the front of the lens and the Macro flash clips onto to this. This prevents you from using a Lens hood and Macro Flash at the same time.

Sigma 105mm F2.8 Macro

- This was my first Macro lens. It's a great performer and a bit cheaper than the Canon 100mm. It does have a slow focus motor in it, this doesn't matter that much if you are trying to capture stationary macro subjects but it's not real useful for in-flight macro shots. This lens also has a extending focus design so the front of the lens extends as you change the focus.
- To use the MT-24 or MR-14 with a Sigma 105 you need the Canon 58C Macrolite Adapter. This screws to the front of the lens and the Macro flash clips onto to this. This prevents you from using a Lens hood and Macro Flash at the same time.

Canon MP-E65

- This is the Macro lens that you do not start with. It is very specialised and only has a 1x to 5x magnification ring. It doesn't have a focus adjustment. Wait, how the heck do you use it then I hear you ask. You move the camera/lens combination forward and back until the subject is in focus. This technique is best learnt on other lenses in MF mode and then honed if and when you pick up a MP-E65.
- This lens is sharp, sharp, sharp but can be very hard to use and get consistent results with. It is always the users fault! Working at a Magnification of 2x or more your subject will be just centimetres from the front element of the lens. This presents special problems, especially with lighting. You need either the MR-14 Ring Light or a MT-24 Twin Light if you plan to use a MP-E65. Although the lighting from the MT-24 is much more adjustable I find that as you increase the magnification more than 4x you are better off with the Ring Light as this puts the light closer to the front of the lens, something that is necessary because the small distance between the front element and the subject.
- I tend to use my MP-E65 in the 1.5x to 3.5x magnification range most of the time and as a result I use the MT-24.

Life Size Converter

- This is like a combination Teleconverter and Extension Tube all in one. It was designed to go onto the Canon 50mm F2.8 Macro lens to give 1:1 reproduction. It does however fit onto other macro lens and will increase the magnification. Unlike a set of plain extension tubes the LSC has glass in it.
- Can be used with other lenses like the 180mm with great results. I've not seen any loss of quality when using it with any one my lenses.

Extension Tubes

- Extension tubes are a very use full addition to a macro photographers kit. Extension Tubes reduce the distance you can get to your subject, giving you greater magnification. Generally you will get about 2x magnification maximum with Extension Tubes.
- Not having any glass in them you can buy other than name brands with some confidence. Kenko is a popular brand and can be picked up cheaper than the name brand version.
- Earlier versions of the tubes by both Canon and Kenko wouldn't accept EF-S lenses, i.e. 60mm Macro or the kit lens. I believe that both have now modified the designs very slightly to accommodate these newer lenses. The old and the new have the same camera mount and it's only the front mount that changes to make it suitable for EF-S as the rear of the EF-S lenses project a little further back towards the mirror.
- I often use three tubes at once, though the Depth of Field (DoF) when you do this is very narrow and the subject just about touches the front element.

Teleconverter

- The Canon 180mm Macro will accept a 1.4x or 2x teleconverter. I don't own a 2x but I have successfully used a 1.4 on the 180mm Macro with and without tubes. You are best to put the teleconverter onto the body and then fit the tubes and lens.
- There is some small loss of image quality associated with using a teleconverter and in Macro you may see this more.

Support – Tripods and Monopods

- **Tripod** - Probably only about 50% of the time will I use a tripod for my macro shots. If you are chasing moving bugs the tripod will be more of a problem. The slightest movement will ruin your setup. Shooting water drops or dew drops I'll go straight to the tripod. Lately I have been using a tripod more and more for my macro shots. I tend to leave the ball head (Really Right Stuff BH-55) loose and this gives me some freedom to change the composition if needed.
- **Monopod** - I do also use a monopod on occasion when I use the 180mm Macro. The weight of a larger lens with a Macro Flash on the end can get to you after a while and the longer Macro lenses balance from the tripod collar on a Monopod well.

Settings – Shutter Speed

- **Shutter Speed** – Handheld I use the 1/focal length rule of thumb, although I sometimes add a little more just to be sure. i.e. for my Sigma 105 I might use a SS of 1/160s while for the 180mm I might be at 1/200s. How fast does your subject move, is it windy. Lots of variables here.
- The other side of the tripod use is it allows you to drop to a slower shutter speed to let in more light if you don't have to worry so much about subject movement or wind. On a tripod I can quite often shoot at 1/60s with the 180mm lens at F16.

Settings – Aperture

- **Aperture** - I usually start around F11 with the 100mm lens and 180mm. Of course this is when I'm trying to get a little more Depth of Field (DoF) on bugs etc, for some flower shots I might be close to wide open. So it really depends on the subject matter. Stopping down gives you a that little more DoF.
- Your angle on the subject has a big influence in how the viewer sees the DoF. Shoot a long subject (i.e. Dragonfly) from head on and very soon the wings will be out of focus (OOF) even at F16. Shoot from side on or just slightly to the front and you use the plane of focus to your advantage, most of the body will be in good focus. Of course the wings will almost always be OOF. Example.
- Stacking images has become a more common thing especially in Digital Macro photography. This is where the in focus areas of several images are combined to give a new image with a great area in focus.

Settings – ISO

- ISO - I like to start low and then adjust it up until the background becomes more noticeable. A lot of the time I might use ISO400. To give you an example, at 1/160 F11 and ISO 100 the background might be black, at 1/160 F11 and ISO 400 the background will be more natural in colour. In bright midday sun you might get F16 1/160 ISO 100.

Settings - Summary

- For a quick start I would recommend these settings F11 1/160 ISO 400 with -1 Flash Exposure Compensation on a diffused flash when using a 100mm lens. These are settings to start with and might not suit your lighting conditions. You'd then start to change them to suit, use you camera's light meter and chimp the results.

Flash

- Mastering the use of flash in Macro Photography will make a huge difference to your shots. A side benefit is that much of what you learn can be applied to other areas of photography i.e.. Portraiture.

Flash

- Probably 80-90% of the time I will use flash with my macro work but almost always I will use Flash Exposure Compensation (FEC) to adjust the flash power. I also use some form of diffuser to cut down on the harsh light. I try to make the photo look if a flash was not used - not that this is always possible. I have a Ring Flash and a Twin Light and with these I set the heads on a 4:1 ratio and also use -FEC so the flash doesn't overpower the shot. Haven't come up with a decent diffuser for the Ring Lite yet though. With macro flash it's all about balancing the light.
- I recommend you don't buy a specialised Macro Flash at first. You are more likely to get better use out of a regular flash. You can use the normal flash in other areas of your photography i.e. Portraiture and also make good use of it for Macro work also. If you then get more serious about your Macro Photography you could then look into the more specialised flash heads.

Macro Flash

- When you start into Macro Photography you quickly find that light is very important. A lot of your shooting will be done at small apertures like F8-F11 and you'll need some additional lighting. This is when you turn to flash.
- The type of flash you use and how you balance you flash output with the other camera settings like Aperture, Shutter Speed and ISO will affect the look of your Macro shot. There are many types of flashes that can be used in Macro Photography and we will look at each of these briefly here.

What to buy?

- So you are going to buy a flash to help with your Macro work - what are you going to buy? As mentioned earlier I recommend you don't buy a specialised Macro Flash at first. You are more likely to get better use out of a regular flash. You can use the normal flash in other areas of your photography i.e. Portraiture and also make good use of it for Macro work also.
- If you then get more serious about your Macro Photography you could then look into the more specialised flash heads such as the Twin Lite and the Ring Lite. Of these two I would be recommending the Twin Lite.

Terminology

- **FEC - Flash Exposure Compensation** is a means of altering the output of the flash. It is expressed in positive and negative values. FEC can be used to balance the flash with the natural light to produce a more natural looking shot. Flash Exposure Compensation only affects the flash output and in the Canon system can be set in either the Camera or the Flash.
- In the automated flash modes the camera will calculate the necessary flash power required and the FEC value is added or subtracted to the calculated value and this new value is then used as the final flash output power.

Pop-up Flash

- There is a good chance that your DSLR camera comes with a pop-up flash. This flash can be used in Macro Photography. You will want to look into your manual and check out how to change the FEC. A good place to start is about $-2/3$ FEC. Take a shot and see how this looks on the screen and on the histogram then adjust as necessary.
- If your subject is very close to the front of the lens, then the lens will shade the flash, you will see this in the resulting shot as a arc shaped shadow across the shot. People have used tissues, ping pong balls and many other things to affect the light output of the pop-up flash. There is also the commercially available Gary Fong Puffer Diffuser.

Regular Flash

- This is the flash that I would recommend you get first. Why - because you be able to use this with so many other areas of your photography. Again you will need a little -ve FEC to tone down the flash output. There are a very wide range of diffusers available for flashes and a lot of these can be used in Macro Photography. The diffusers soften the light output from the flash and prevent harsh shadows. Some examples are the Stofen Diffusers and the Lumquest Diffusers.
- Many of the flash heads available have tilt and swivel features and these can be used to alter the direction and angle of the light. It is not usually possible to use bounce flash in macro work as a lot of the time you will be outdoors. Tabletop work would be the exception to this.
- *Examples* Canon 580EX II, 430EX II, Nikon SB-400, SB-600, SB-800, SB-900, Sigma EF 530 DG ST, EF 530 DG Super

Flash Bracket

- Locating the flash off of the camera can make a dramatic difference to your shots. While it is possible to hold the flash in your left hand and the camera in the right it is easier to use a Flash Bracket. The Flash Bracket will attach to the camera via the tripod mount and you can then position the flash head on the end a movable arm to best light your subject. The other item you need to complete this type of setup is a off camera flash cord. This cord connects to the hot shoe and to the flash, at the base of flash end is a screw mount to connect it to the flask bracket.
- With a longer macro lens and extension tube setup up it is possible that the subject will be close enough to the front element of the lens that the flash will not light it fully. In this situation you can get a shadow from the lens ruining your shot. This is when a flash bracket can be very useful.
- The flash bracket will normally mount onto the bottom of the camera and raise the flash up and closer to the front of the lens. The tilt and swivel features are a big help here also. This can make a dramatic difference to your shots as you now have total control over the angle and direction which the light is coming from.
- When using a flash bracket with the Canon system you will need an off camera cord to connect the flash to the camera. Alternatively you could use two flashes in Master Slave and the inbuilt trigger system but this become slightly unreliable in full sun light.

Ring Lite

- These are often associated with Macro Photography. They consist of a control unit that mounts to the camera hotshoe and the ring lite portion connected via a lead. Some lenses (Canon 180L) require an adapter ring that screws to the front of the lens before the Ring Lite can be clipped on. The Ring Lite has two flash tubes and these are independent. i.e. you can change the output power of each of them individually. Usually the easiest way to do this is with the Ratio setting. Typically you could set a 4:1 ratio, providing a difference in the output power so some shadows are present.
- Ring Lites can product a very flat lighting and setting a ratio can help to prevent this. The Ring Lite is very hard to add an additional diffuser to. There is some diffusion built in but this is often not sufficient. The light from the Ring Lite will always hit the subject very square on and this causes very few shadows, something that can work either for or against you.
- *Examples* Canon MR-14 EX, Sigma EM-140

Twin Lite

- This is an other dedicated Macro flash head. Again you have a control unit on top of the hotshoe and leads to connect to the two independent flash heads. The flash heads on the twin lite can be adjusted in many different ways making it more versatile than the Ring Lite. You can adjust the heads in almost any direction to provide the exact lighting that you require.
- In addition there are Stofen diffusers available for the Canon MT-24 Twin Lite or you can also build your own using a variety of materials. I use two Gary Fong Puffer Diffusers held onto the heads with small Velcro tabs. The Puffer Diffusers are designed to mount onto the pop-up flash to provide some diffusion.
- Both the Twin Lite and the Ring Lite have Modeling Lights built into them. With the Twin Lite, a Custom Function in the flash can be set to trigger the Modeling Light with a quick double tap of the shutter button. This Modeling Light is then used to assist manual focus.
- The Canon MT-24 can fit directly to the Canon 60mm Macro, Canon 100mm Macro, Canon MPE-65mm Macro but does require an adapter to the Canon 180mm Macro.
- It is worth while pointing out that using either a Ring Lite or Twin Lite precludes the use of a lens hood.
- *Examples* Canon MT-24 EX, Nikon R1 and R1C1

Multi-Flash Setups

- It is possible to use multiple flashes in Macro Photography. Your success will depend on the location and subject as these systems can take a little time to setup and get adjusted correctly. In these setups you might have a Twin Lite on the camera and a separate flash head on a stand or even positioned on the ground. The second flash could be used to light the background while the Twin Lite is lighting up the subject. Multi-Flash is easier for Table Top Macro work than outdoor Macro work usually because your outdoor subject is more likely to be mobile.
- The Ring Lites and the Twin Lites along with the 580EX can act as Masters in a multi-flash setup. Canon also produce a ST-E2 that acts as the flash controller but has no flash tube. With Nikon cameras this can be done from the camera itself without the need for a flash attached to the hotshoe. This provides wireless off camera flash. The Canon 430EX can only act as a Slave.

Diffusers

- It is easy to get blown out areas from the flash reflecting off of a shiny insect body, in some conditions is it almost impossible to remove these. Many insects are very reflective and a Diffuser can be used to reduce or soften the light output from the flash. A larger, diffuse light source is less likely to produce harsh shadows. The Stofen and Lumiquest Diffusers are commonly available and useful in other areas of photography.
- Small Round collapsible Diffusers can also be used to change the natural light hitting the subject. You can use a small white Diffuser to block out the bright midday sun, or reflect more light onto your subject. In a pinch I've often used my hat to shade my subject, but you quickly run out of arms to hold everything.



DIY

- Many people make their own diffusers and flash brackets, milk bottles tissues and Aluminium foil are commonly used in home made diffusers. This is one area where you could save a little money. A search on Google will show a wide variety of home made setups.

Insect Stalking

- Slow and steady wins the race. Watch your shadow and the shadow from the camera as both could spook the insect, approaching from low down will help.
- Often you can approach your subject in stages. Start out from a reasonable distance away snap off a couple of shots (the I was there shot), these might be the only ones you get at first. Slowly move in a little at a time snapping a few shots as you go. You'd be surprised how close you can get with this technique.

In-Flight Insects

- Auto Focus and Macro don't normally go together well, but when shooting Insects in flight I will use the AF and AI Servo function on the camera. I try to predict where they were likely to go next and pre-focus on the flower and then move over to the bee as it approaches.
- I have my shutter half pressed and the camera set on AI Servo so it locks focus as I moved onto the bee. All this means is the focus elements in the lens move very little when you move over to the bee so you get focus very quickly. Still a bit hit and miss though, be prepared for disappointment at first when you try this.



Getting to know your Garden

- It's amazing what can be found in the suburban backyard.
- By sitting still and quietly looking you are likely to see Bee, Flies, Hoverflies, Dragonflies and Spiders.
- Look underneath leaves and in unexplored corners.
- Both the City and Mt Cootha Botanical Gardens are a Macro Photographer playground.



Composition & Colour

- Your settings will determine how your shots look. Higher Shutter Speeds and smaller Apertures often result in black backgrounds.
- It is possible to use ISO to bring colour into your macro shots. When you keep the Shutter Speed and Aperture constant and then increase the ISO you will notice the background quickly become brighter.

Visualising the Plane of Focus

- As you will have gathered, a key part of Macro Photography is Depth of Field. Understanding the limited DoF you have and using this to your advantage will improve your photography.
- It is useful to visualise the Plane of Focus as a shape. The angle you attack the subject influences how the Plane of Focus is “placed upon” your subject and hence how much of your subject appears to be in focus. This is a [3D example](#).



Conclusion

- Macro Photography can be fun. You need very little other than a camera and a lens to get started.
- Getting out into your garden will open you're your eyes to a wonderful world of Macro subjects.