

LepNet Photography Directions

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Hello and Welcome!! This guide was put together to help anyone using to use the Entomology corner office photography set up for specimen digitization. We are on the brink of having an electronic library with images of our specimens and this is our current standard for images of the specimens. (Of course, any image of a specimen is better than no image, however!)

This guide is geared toward documenting specimens for the LepNet project but will be helpful for any photography project.

If you are imaging Lepidoptera, please review the "Imaging Basics" guide on the LepNet homepage first: https://www.lep-net.org/?page_id=1346

Key notes on taking LepNet images in our collection:

1. Images must be photographed on a 18% grey metal plate background.
2. Line up the labels on a white rectangular surface that is on the same vertical plane as the Lepidoptera specimen's wings
3. Position this rectangular label surface along the bottom of the image frame.
4. Have the 5mm or 10mm scale bar pop up from the top left edge of the white label surface (see a lepnet picture) but not so that it is touching the left edge of the frame of the image.

(This is because during processing the computer will use the contrast of the grey background and white rectangular label surface to know where to start the horizontal cut to cut the labels out. We want the scale bar to still be a part of the finished image.)

5. Slant the top edge of the label surface so that the left side is slightly higher than the right side! This will make for a clean cutout of the label surface during processing.
6. One photo with the specimen and its labels
7. A second photo with the specimen and the size bar if the specimen is small
8. Strive for diffused and even lighting on the specimen

Step-by-step instructions for using the corner office set up for our LepNet-style photographic images:

Part 1

Open 3 Core Software Programs:

Turn on the two external monitors (If they are not on already)
Log into computer.

We use 3 software programs for Imaging: [Passport](#), [Lightroom](#), and the [Canon Camera EOS Utility](#):

In the bottom right bar, click and open “[Passport](#)” and also “[Lightroom](#)”
[Lightroom](#) is the program that manages the photo files and naming for us.
[Passport](#) manages the track that the camera is on.

When you open Passport, you should hear a robotic sound from the track. That means that the electronic track is responsive to the software on the computer. If you do not hear a sound, make sure the “Stackshot” control box is plugged in. (Sometimes I (Isa) unplug it on my way out the door to save energy.)

If you do not hear the sound and the “Stackshot” box is on. Try completely quitting out of the [Passport](#) program and reopening it.

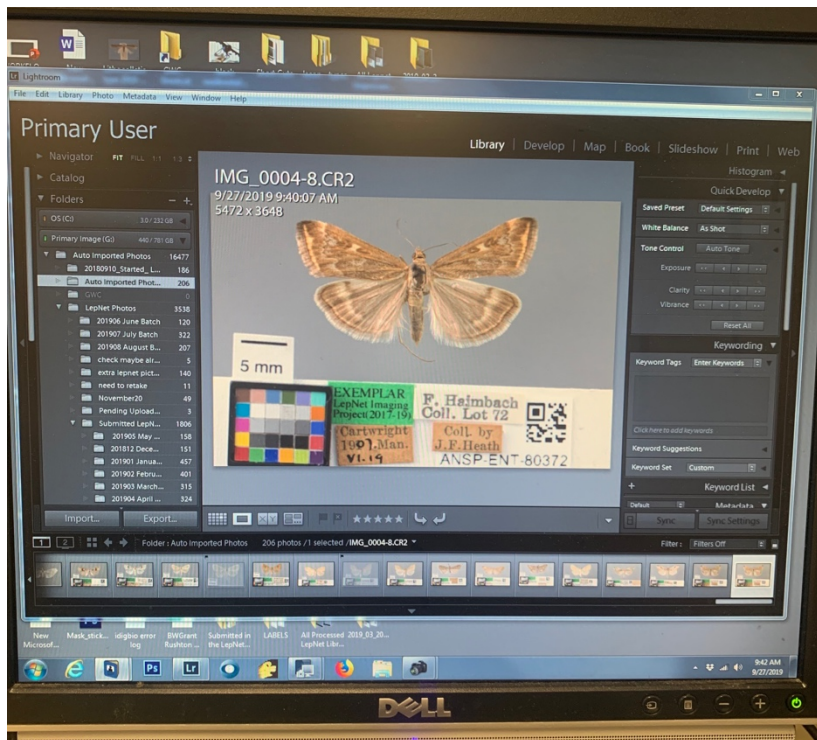
The third software ([Canon EOS Utility](#)) is only available to open when the camera is on. To turn the camera on, look for the switch that is labeled with “on” and “off.”

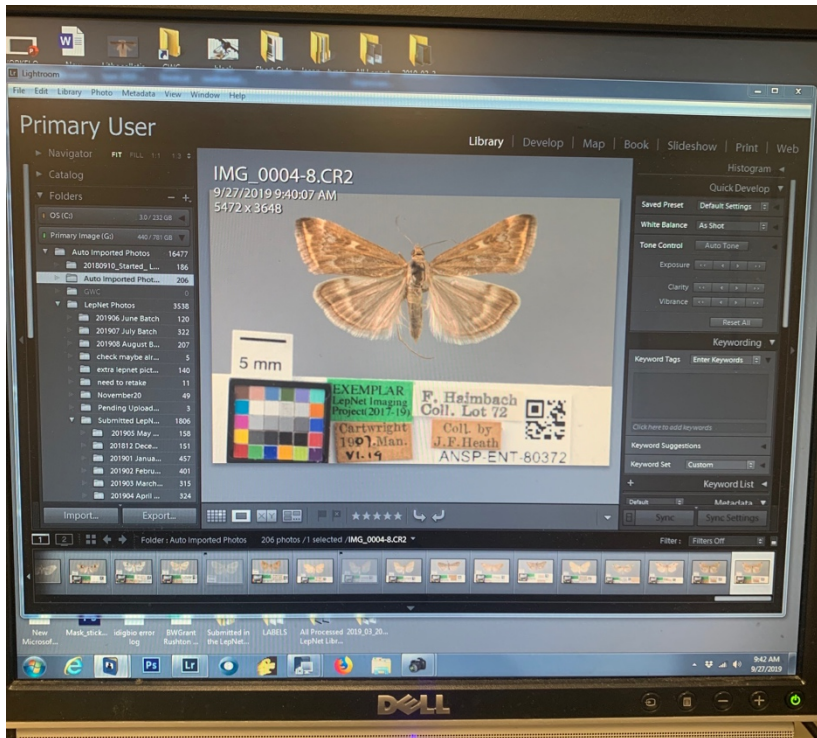
Once switched on, a button with the image of a black canon camera will appear on the bottom left bar. (Click “Cancel” on the “Memories Upload” window that pops up.)

Click the black camera button and a new window menu pops up – click the “[EOS Utility](#)” option. A tall rectangular camera control menu appears.

Click “Live View Shoot” to open the live view to see the frame of the workspace.

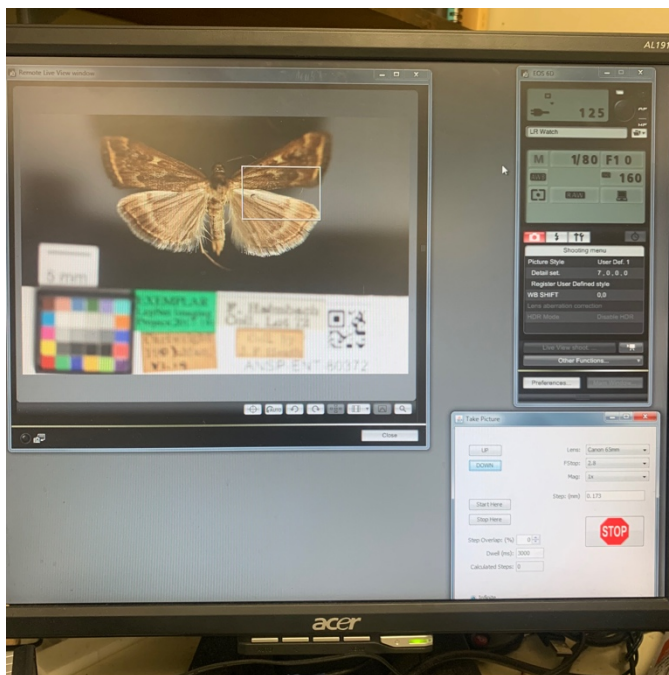
Now all three software programs are up. You are ready to take photos! (Though there are still many other items to discuss – such as how to manage the lighting (or the Photons! This is Photo-graphy after all) and also how to manage the specimen set up.





On the left monitor I have Lightroom open.

In the bottom bar you can see the icons for the three primary softwares – Passport, Lightroom, and Canon EOS Utility.



On the right monitor, I have the Canon EOS Utility and its live-view window open.

The Passport software is the window in the bottom right corner.

Part 2 Activate the photons

Normally I say that there are 4 buttons to turn on, but at this point, there are three remaining since we already flipped on the camera in Part 1. So, if you are following these instructions, there are three remaining switches to turn on to activate the camera flashes so that the specimen may have enough light for image capture.

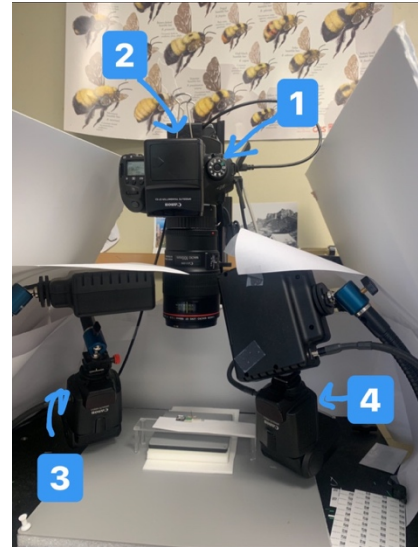
The two camera flashes have gray on switches and the flash transmitter which is “on top” of the camera (or on the side since the camera is facing down).

When the twitches are flipped, the back of the flashes will give off flashes of red and the transmitter's red indicator light will be on.

Note: If the flash transmitter doesn't work, get a spare battery. Sometimes, if the system has been left alone, the flashes will go to sleep and taking a picture will wake them up so that the second time you take a picture, they will be active and go off.

Optional: If you want, you may use the rectangular LED panels to add light to the stage. There is a black box in the back, left side of the set up that has a round switch. Flip it and the LED panels will light up. If you use the LED panels, you have 5 switches to turn on and off as you begin and end your imaging work.

When I begin work, I flip on all four switches at once.



Note: The flashes are facing away from the specimen so that the light bounces and diffuses nicely onto the specimen. They may require some tweaking as you go about photographing different specimens.

Part 3 Specimen Selection

In order of priority:

Choose a specimen that is in good condition. We want all the features to be visible.

Choose a specimen whose wings are all on the same plane so that they will all be in focus in the image.

Choose a specimen that is local or from along the New Jersey Coast.

Choose a specimen that has complete data.

Choose a specimen that has accessible/removable data labels (There have been some cases where the label is above parts of the specimen)

Choose a specimen that has smaller data labels (better to fit into the frame)

Note:

Remember to be careful with the specimen. The specimen's safety is our top priority.

Damage = data loss and degraded value.

We do realize that damage is sometimes inevitable – a wing might be loose, mistakes are made.. If a specimen is damaged while you are working with it, ask one of the curatorial personnel in the department for guidance in mitigating the situation and minimizing data loss. Thank you!

If possible, photograph a male and a female.

If there is a lot of variation within the species, photograph more than one.

Part 4 What's in the Frame

When I begin each session, I wipe off the gray plate surface. We work in an old museum that has lots of dust floating around and landing on surfaces so before each session, wipe off the background surface to eliminate dust from the image.

Time to discuss specimen set up.

We will work backwards.

LepNet wants a clean, focused, image on a gray background that includes a scale bar. The specimen should take up most of the frame.

Through our set up, our final product looks like this: [add final product image here]

The black bar is created by a script. Our photos include labels, but the labels are cut out by the script and replaced with this computer formulated bar.

We line the labels up on the plastic table platform on a white surface. This white surface is plain white computer paper – it may start to get dirty from use and may need to be replaced at some point.

The base content on the surface of the white bar consists of the color calibration chip, the LepNet Imaging EXEMPLAR green label, and a scale bar (Usually a 5mm or 10mm printed white label), which sticks up from the white bar so that it isn't cut out during the script.

When a specimen is selected (see next section), the labels come off and are arranged on the platform so that they are visible in the frame. This part is like Tetris. We want the labels to take up minimal space in the frame, so arrange them so they fit in a compact way, but make sure all data on the labels are visible. In this way all the data is present and the camera can be as zoomed in as possible to make the specimen fill as much of the frame as possible.

Tiny Specimens:

If the specimen takes up less than half of the frame, take two pictures. One that includes the specimen and the labels, and a second that includes only the specimen and the scale bar in the frame. Do leave a hint of the white bar so that the script works smoothly and cuts and adds the black automated bar.

In the case where two photos are taken, the zoomed in photos will be delivered to LepNet and the photos that include the labels will be kept for our own purposes here at ANSP.

Part 5

Taking the Shot

Ok your software is open, specimen selected, stage set up. Time to snap the shot.

Look at the live view window of the [Canon EOS Utility](#) software and see what is in the frame. Make sure the specimen is 'straight' or lined up neatly.

Make sure the white data table is lined up

Considerations:

We want the specimen to fill as much of the frame as possible so that we may capture as much detail as possible.

We also want all the labels to fit in the frame too.

Approach:

Zoom in as much as possible without cutting out label data or parts of the specimen.

It is ok if the color calibration chip is a bit clipped.

2 main tools for zooming, framing, and focus:

1) Use the [Passport software](#) to move the camera up and down to adjust focus.

2) Use the manual focus on the lens (twist the lens barrel) to adjust focus.

You will have to go back and forth, tweaking both to achieve the desired zoom, framing, and focus.

Camera Lenses:

If you are still having difficulty, the situation might require changing lenses.

We have 3 lenses at the set up,

1) 50mm macro lens

2) 100mm macro lens

3) 65mm 1x-5x macro lens

All are Canon brand. We also have a set of 3 extension tubes of various lengths that can be paired with the lenses.

My favorite lens, and perhaps the one that works for most specimens, is the 100mm Macro Canon lens.

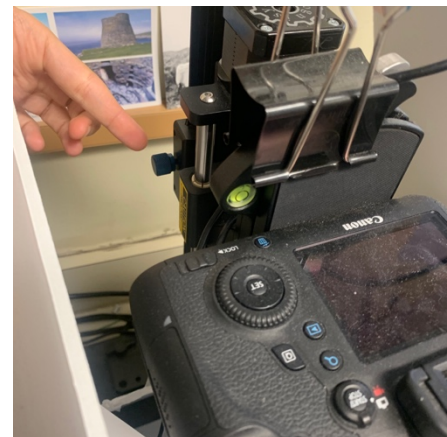
If you need extra magnification, pair it with an extension tube or two.

If your specimen is huge and doesn't fit in the frame, try using the 50mm lens.

If your specimen is totally tiny, use the 65mm 1x-5x Canon lens.

The tricky thing about the 65mm lens is that it might be great for the specimen + scale bar only shot but might be too magnified for the specimen + data label shot. That is why I prefer the 100mm macro + extension tube option; it is more versatile.

In zooming and framing, you may have simply hit the end of the "stackshot" Passport track and the camera can go no further. Stand up and manually move the track on the bigger vertical track by loosening the knob on the left, just behind and slightly below the camera and electronically controlled track. Hold onto the electronic track and move it up or down (whichever you need). I find it easiest to apply pressure with one hand while holding the manual track with my other hand or to have some fingers on the electronic track and the others on the manual track... I'm having trouble explaining this- go ahead and you will figure it out.



Part 6

It is too bright! It is too dark! What to do.

There are physical tweaks and software tweaks

Software:

In EOS Utility you will find controls for the Shutter speed, Aperture (Depth of field) and ISO.

Aperture controls the depth of field. It also affects how much light get in the lens.
A higher number = less light but greater depth of field

Lower number = more light but shallower depth of field.
It is important to consider the depth of field especially with insects whose body parts are all on one plane. For example, you can use a shallower depth of field with a well spread and dried lepidoptera specimen. However, it is helpful to increase the aperture number for a specimen whose body parts are not all on the same plane. Maybe the wings are more slanted vertically, for example. At the same time, you don't want to high of an aperture number, or sharpness is lost- the image starts to get soft.

For our purposes, try to keep the aperture between F8 and F13, inclusively.

Shutter Speed:

The number represents how fast the shutter opens.

Shutter speed is usually represented as a fraction. 1/100 is a decent shutter speed for a taking handheld image. However, the speed can be slowed so much that it is open for full seconds.

A slower speed lets in more light but also risks blur. A faster speed lets in less light but may result in a crisper (blur free) image.

For our purposes, keep the shutter speed between 1/40 and 1/160, inclusively.

Trouble shooting: For whatever reason, when I go above 1/160, the shutter speed has gotten stuck. I can't bring it back down through the Canon EOS Utility software. Through speaking with Canon customer service and through fiddling on my own, I have figured out a workaround. Unplug the cable that connects the camera to the computer. Then manually turn down the shutter speed using the wheel dial on the left side of the camera, below the panel that displays the shutter speed. Then reconnect the camera with the computer. You should be good to go.

Stay at 160 or below. You don't want the shutter speed to be too high anyway or it will be too fast for the camera flashes.

If your image is too bright, I still have two more fixes for you.

ISO

This is how much data the sensor is taking in. If you are in a dark situation, you'll likely have your ISO level higher to take in more information. If you are in a bright situation, you'll have your ISO low.

You can't go lower than 100. If you do that, you'll find that the ISO reverts to an automatic setting. Don't shoot on the automatic setting.

Please keep the ISO between 100 and 250. Above 250, the image becomes more grainy than desired.



[Continued]

