

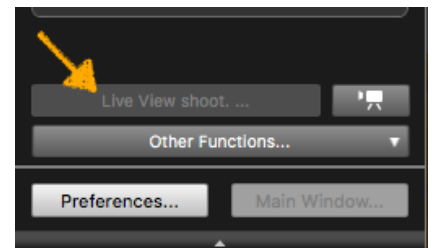
FOSSIL INSECTS OF LA: Imaging Protocol

Step 1. INITIATING THE IMAGING STATION

- Power-up imaging equipment. Turn on:
 - IKEA lights (small lamps)
 - Both copy stand lights (if using the Bencher copy stand)
- Make sure all cables are connected:
 - **Attached to Canon camera:**
 1. AC battery adapter (connects from camera battery to power strip)
 2. Canon USB cable (connect from camera to computer)
 3. Trigger cable (connects Canon to StackShot controller)
 - **Attached to Stackshot:**
 1. StackShot power adapter (plugs into power strip)
 2. Rail cable (connects StackShot to camera rail mount)
- Check that the camera is level (set the bubble level on the viewfinder screen)
- Turn on computer
 - Log in: “LACMIP Volunteers” (Pwd = NHM1913)
- Turn camera on (look for switch on top of camera)
 - Turning on camera should initiate the Canon EOS Utility 3 software
- Turn on/open:
 - Adobe Lightroom
 - LACMIP_Photography_INSECTS_Master spreadsheet (alias on Desktop)

Step 2. POSITION THE SPECIMEN

- In the Canon EOS Utility 3:
 - Select Remote Shooting
 - Turn on Live View mode (“Live View Shoot ...” button)
- Choose a specimen with a pink camera tag.
- Uncap camera lens (do not touch the glass!)
- Place the specimen directly under the lens.
 - If there are two parts on the slab, always begin by imaging Part A.
 - You may *very gently* blow on the specimen to remove and dust that has accumulated over time.
- Bring the specimen into focus by moving the camera up/down by twisting the knob on the copy stand. Then fine-tune the focus in Live View using the StackShot’s FWD (down) and BACK (up) buttons.
 - FWD makes the camera move DOWN toward the specimen
 - BACK makes the camera rise UP and away from the specimen



Whenever manipulating or moving the camera, be absolutely certain that **the glass on the camera lens does not touch anything**, including the specimen!

- If needed, adjust the lights so the specimen is clearly illuminated on the computer screen. What you see on-screen will be darker than the resultant image. Adjusting the camera's shutter speed (outlined in steps below) will also help control lighting in the final image.
 - The lights should not have to be adjusted for every image. (This will save you time!)
 - Aim to capture even, consistent lighting across every specimen.
 - If ripples in the shale are very obvious in the resultant pictures, you can use diffuser paper to "flatten" out (diffuse) the light. (Lindsay can show you how to do this.)
- Specimens must be imaged at one of the magnification levels in yellow on the barrel of the lens: 1x – 5x.
 - Twist the lens such that the focal ring is perfectly aligned with one of these yellow lines on the lens barrel—not above or below, but **precisely on the line**.
 - ★ Please image both parts of the same specimen at the same **orientation** and **magnification** (i.e. try to create mirror images)
 - ★ Most specimens should be imaged at **2x or 3x**
 - If a specimen is too large to image with the 65mm lens at 1x, place a pink **Nikon tag** in the box and move on to the next specimen. Likewise, if a specimen is too small, place a pink **microscope (Keyence) tag** in the box and move on. The latter scenario should be relatively uncommon.



- Position the specimen under the lens. Refer to examples below:
 - **Center** the specimen in the frame of the image.
 - Leave some **margin space** between the specimen and the edge of the image.
 - If both parts are preserved (A+B), capture both halves (aim for **mirror images**).
 - The **entire specimen** should be visible within the frame of the image and placed in a **logical, aesthetically pleasing orientation** (not upside down).
 - ★ **Ideally:**
 - The insect's head should be oriented up or left/right depending on how the specimen best fills the frame of the image.
 - Position isolated wings + elytra left/right with leading edge up.



Lindsay can provide more examples!

- The camera settings in the EOS Utility should be set as follows:

- Manual (**M**) mode
- White balance = **K=3000**¹
- Shutter speed = **see table for suggested s. speed**→
- Aperture = **F5.6**
- ISO = **100**
- File format = **RAW**

S. Speed	Lens Mag.
1/40	1x
1/25	2x
1/20	3x
1/10	4x
1/8-1/5	5x

- Close Live View in EOS Utility².
- Take a test image by clicking on the shutter button (black circle) in EOS Utility. Repeat as necessary until the specimen's position, lighting, and white balance are satisfactory, then re-activate Live View and continue.

Step 3. CAPTURE IMAGE

- Using the StackShot controller in Auto-Step mode, select the # of photos ("steps") you want the camera to take for the specimen. See box at right to access Auto-Step mode. Start with ~7 steps and modify this # depending on how flat the specimen is.³
 - Press SELECT again so that the > arrow drops to the next line.
 - Press UP/DOWN to increase/decrease the numbers of steps.
 - Press SELECT again so that the > arrow drops to the next line.
- Once the specimen is framed appropriately, use the StackShot's FWD/BACK buttons to raise the camera such that the highest part of the specimen is *slightly* out of focus.
 - Press UP to mark the starting point of the image series.
- Press the FWD button to move the camera down so that the specimen comes into focus. Then, keep going until the specimen is *slightly* out of focus and stop the camera there.
 - Press UP again to mark the "End Pos(ition)" of the image series.
- Turn Live View off in the EOS Utility.
- Press UP again to initiate the camera. The camera will begin taking photos, which will automatically import into Lightroom from the LR Watch desktop folder. Avoid touching the table while the camera is actively taking photos.

If the StackShot controller is not already in Auto-Step mode:

- Press the SELECT button until the on-screen arrow points toward "Mode"
- Press UP until the mode reads "Auto-Step"
- Press SELECT

TIP: If the camera starts moving or taking pictures before you're ready, you can abort and restart the process by pressing UP or DOWN at any time. Pressing the same button again will raise the camera back to the starting position and it will re-start the photo sequence.

¹ "AWB" (auto white balance) usually works well, but, if needed, white balance can be fine-tuned using the "K" (Kelvin) option. In this case, start with K=3000 and adjust accordingly.

² The camera will not take photos if Live View is active.

³ If you ever need to troubleshoot the StackShot, there are good instructions on the manufacturer's website: https://www.cognisys-inc.com/products/stackshot/stackshot_technical_specs.php

Step 4. EXPORT IMAGES

After all the photos have been imported into Lightroom:

- Highlight (SHIFT+click) all photos that were just imported and use the arrow keys to quickly scan the image series. This is a quick check to make sure the series will stack into one completely in-focus image.
 - Right click > Export > Helicon Focus
 - Wait for all photos to import into the software

Step 5. STACK IMAGES

- In Helicon Focus:
 - All photos to be stacked should have a checkmark (they should automatically import this way)
 - Select METHOD A (weighted average)
 - RADIUS =1; SMOOTHING = “1”
 - Choose “Render”
- After the final stacked image is output, use the 1:1 zoom (lower right-hand side of the window) and arrow keys to check that the entire specimen is in focus and contained within the frame of the image. *If it is not completely in focus, you should re-capture the image.* However, it does not matter if parts of the surrounding rock (without specimen) are not in focus.

Step 6. CREATE FILE NAME & SAVE IMAGE

- In the **LACMIP_Photography_INSECTS_Master.xlsx** spreadsheet (on the desktop):
 - Fill out all fields, paying close attention to:
 - **locationID** = 2533 (loc # for entire Statz Collection)
 - **LOT_ID** = 2nd half of catalog number following 2533; e.g. for LACMIP 2533.50, the lot ID is 50 (look at the sticker on the specimen slab)
 - **P/CP** (part-counterpart): If there are two halves (parts) present for the specimen, fill out appropriate A or B in this column
 - **Magnification**: Record the magnification that you used on the lens (1x, 2x, 3x, etc)
 - Click into the Filename cell and right-click to copy this text
 - In Helicon Focus:
 - Under “Output”, right-click on the stacked image > Save
 - Navigate to the appropriate folder:
 - Computer desktop > Fossil Insects STACKED
 - Subfolder with the current month and your name (e.g. 2018-03_Lindsay)
 - Subfolder organized by **lens magnification** (e.g. 2018-03_65mm_1x_LW)
- Following this hierarchy, please create a new set of folders for yourself every month.*

- Save the image as a **Tiff** (*.tif) (no compression)
- Once the entire specimen is imaged (both halves), place a “Specimen Imaged” tag in its box.
- Repeat starting at Step 2!
 - **Helpful tip**: Try to consecutively image specimens that are similarly sized to save you the time and trouble of having to constantly re-adjust lens magnification and other camera settings.

Please fill out this information **very carefully**. The image will be useless if it is entered incorrectly. ☹



The image must be saved in the correct subfolder for the appropriate **scale bar** to be digitally inserted. Please choose carefully!

Step 7. ENDING YOUR IMAGING SESSION

- Turn off camera
 - Replace lens cap
 - Replace dust cover
- Unplug StackShot power adapter cable (completely, not partially)
- Save and close file naming spreadsheet