

## Module 1G: Imaging, Fluid-preserved

### Module 1G: Phototank Immersion Imaging: Image Capture\*

Task ID	Task Name	Explanations and Comments	Resources
T1	Mount camera on tripod or copy stand.	A tripod-mounted camera facilitates long exposures.	DSLR Camera. Tripod. Camera manual.
T2	Place camera behind black foam board blind and insert lens through a central circular aperture.	The blind prevents the phototank glass from reflecting the camera and photographer into the image.	Black foam blind.
T3	Set camera white balance.	The white balance setting should match the light source, (e.g. incandescent, daylight, etc.)	
T4	Position camera/tripod to ensure that the specimen will occupy about 90% of the frame.		
T5	Set ISO, shutter speed, and aperture.	An ISO of 200 allows smaller f-stops (hence enhanced depth of field). Set f-stop between 11 and 16, Allow camera to automatically select the shutter speed to match the ISO and f-stop settings. Alternately, select	

		the shutter speed manually, utilizing the camera's light meter.	
<b>T6</b>	Set camera/lens to macro mode, if required by the camera.	Depending on the lens, the zone of focus might be different. The $\frac{1}{3}$ - $\frac{2}{3}$ rule is flipped for standard lenses versus macro lenses.	
<b>T7</b>	Set camera focusing on autofocus and position the camera's focus point on the center of the subject.	Autofocus generally works fine as long as the active area of focus includes important features on the fish, not the scale bar or background.	
<b>T8</b>	Select image type.	Depending on potential use of the image, images may be recorded as one or a combination of RAW (NEF for Nikon, CR2 for Canon, DNG), TIFF, or JPEG, with several levels of JPEG (fine, normal, basic, varying by compression ratio, and pixel count). RAW files preserve the most complete set of image data and provide the best opportunity for non-destructive editing and post-imaging processing, but usually require ancillary processing software. Uncompressed TIFF images also retain a full complement of image data, result in larger file sizes, and are subject to destructive editing. DNG is an open standard RAW file format recorded directly by some cameras. Many	<a href="https://www.idigbio.org/sites/default/files/sites/default/files/Image File Format Recommendations and Standards.pdf">https://www.idigbio.org/sites/default/files/sites/default/files/Image File Format Recommendations and Standards.pdf</a>

		RAW formats can be converted to DNG by freely accessible conversion software.	
<b>T9</b>	Pose specimen.		
<b>T10</b>	Record image.	<p>In the field, particularly when the sun is intermittently blocked by clouds, it is advisable to record multiple images for each of several combinations of exposure and aperture (f-stop) settings. Full sunlight often highlights fine structures but may also wash out bright colors or result in over-exposed hot spots on the snout or dorsum. The phototank should be carefully oriented with respect to the light source, and extra mat boards used to shadow harsh sunlight and maintain vibrant colors.</p> <p>The number of individual images to record per specimen is proportional to:</p> <ul style="list-style-type: none"> <li>• the impressiveness or uniqueness of the specimen,</li> <li>• the time expended to pose it properly, and</li> </ul>	Mat boards for shading subject.

		<ul style="list-style-type: none"> <li>the difficulty of accessing of the specimen (especially for field images).</li> </ul>	
<b>T11</b>	Insert uniquely numbered reference tag into tank and record reference image.	Uniquely numbered reference tags allow for subsequent tracking and matching of multiple field or lab images of a single specimen to a correlated entry in a field book or image log, preventing specimen misidentification.	Pre-numbered or unnumbered identification tags.
<b>T12</b>	Affix uniquely numbered reference tag to specimen and record the number, specimen length, and other specimen characteristics in a field image log.	<p>An image log is useful for recording the standard length of the specimen and other characteristics. Such practices greatly facilitate subsequent annotation of images with catalog and measurement data.</p> <p>Data entered into the log may also include geographic coordinates from a global positioning system (GPS). Many newer digital cameras have a built in or accessory global positioning system receiver that records and embeds latitude, longitude, altitude and universal time as image metadata.</p> <p>Collecting event metadata may also be stored in an initial entry in the</p>	Image log.

		field log, facilitating georeferencing and later entry of collecting event data into an electronic database.	
<b>T13</b>	Record reference image for later identification.		

\*Adapted from [Sabaj Pérez, M. H.](#) 2009. Photographic atlas of fishes of the Guiana Shield. p. 53–93 *In*: Vari, R. P., C. J. Ferraris, Jr., A. Radosavljevic, and V. A. Funk, eds. Checklist of the freshwater fishes of the Guiana Shield. Bulletin of the Biological Society of Washington, no. 17.