

Module 1H: Imaging, Fluid-preserved

Module 1H: Phototank Immersion Imaging: Image Processing and Editing*

Task ID	Task Name	Explanations and Comments	Resources
T1	Open image processing software.	<p>Adobe PhotoShop is popular and widely used. The tasks itemized here refer mostly to this software.</p> <p>Camera-manufacturer specific image management and processing software is also available and is sometimes distributed with the purchase of high-quality DSLR cameras.</p> <p>Note: PhotoShop and similar image processing software packages are sophisticated tools with extensive capabilities for manipulating images and usually require intensive experience to master. A full accounting of these capabilities is beyond the scope of this document. Those recording and processing images of scientific specimens should become familiar with at least the fundamentals of one or more of these packages.</p>	<ul style="list-style-type: none"> • Photo processing software, including but not limited to: Adobe PhotoShop, • Adobe Lightroom, • Canon Digital Professional, • Nikon Capture NX 2, • GIMP, • Aperture. <p>See for reference: <i>Avoiding twisted pixels: ethical guidelines for the appropriate use and manipulation of scientific digital images</i>, by D. W. Crome, <i>Science and engineering ethics</i> 16 (4) p. 639-67. http://www.ncbi.nlm.nih.gov/pubmed/20567932#</p>

		Please note cautions in M1DT4.	
T2	Open an original image.	Opening RAW images in PhotoShop or other image processing software may require a software plug-in. If so, accept the default values assigned by the plug-in while opening or importing the image.	
T3	Create a new layer that duplicates the layer of the original image.	Editing should never be effected on an original image.	
T4	Create a blank layer for masking.	Masking colors may be black, white, or a shade from the original background, the latter of which can be selected with the eyedropper tool.	
T5	Using the paint bucket tool or the edit/fill tool, fill the mask layer with the appropriate color.		
T6	Move filled mask layer to bottom of layers dialog.	The mask layer should be dragged below all other layers in the layers dialog to act as the background for the finished image.	
T7	Make the specimen layer active and use a drawing tool to carefully trace the	Tracing the contours is in preparation for merging the specimen image with the solid	

	specimen's precise contours.	background represented by the solid-filled mask layer. PhotoShop CS5 and later include quick selection and refine edges tools to make this process easier.	
T8	Create a layer from the traced outline and turn off the original image in the layers dialog.	This will isolate the cutout on the black background. Caution should be exercised to ensure that parts of fine edge data are not lost in this process.	
T9	Adjust image quality.	A suite of tools is available for adjusting image quality. In general, only modifications made to an entire image, rather than to parts of an image, are desirable, especially for images to be used in publications. Other changes are suspect of scientific misconduct. Acceptable adjustments might include: <ul style="list-style-type: none"> • rotating, • cropping, • resizing, • adjusting contrast, 	See for reference: http://www.nature.com/authors/policies/image.html , or http://www.sciencemag.org/site/feature/contribinfo/prep/prep_revfigs.xhtml . <i>Also see: Avoiding twisted pixels: ethical guidelines for the appropriate use and manipulation of scientific digital images, by D. W.</i>

		<ul style="list-style-type: none"> adjusting white balance (unless accurately calibrated previously). 	<p><i>Cromey, Science and engineering ethics 16 (4) p. 639-67.</i></p> <p>http://www.ncbi.nlm.nih.gov/pubmed/20567932#</p>
T10	Add visible scale to image.	<p>Rendering a solid scale bar within an image can be accomplished by:</p> <ul style="list-style-type: none"> rotating the entire image so the scale is horizontal in relation to the subject, using the rectangular marquee tool to select and copy a 5 or 10-mm-long portion, rotating the entire image back to its intended final position, pasting the copied selection, thereby creating a new layer, adjusting the brightness/contrast of this layer to extreme values to render a black or white bar that is then labeled accordingly with the text tool. 	

*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.