Module 1: Imaging

Module 1E: Phototank Immersion Imaging: Equipment Set-up*

Task ID	Task Name	Explanations and Comments	Resources
T1	Retrieve appropriate size phototank or wet box.	Phototank size varies, common sizes are approximately 13.5 × 10.25 inches and 15.75 × 12.25 inches. These dimensions are well suited for lateral, dorsal, an ventral views of small to medium-sized fishes to about 300 mm long and 63 mm wide (smaller tank) and 370 mm long and 75 mm wide (larger tank). Tanks and wet boxes may be vertically or horizontally oriented (see http://www.mcz.harvard.edu/Departments/Ichthyology/fish_imaging.html for horizontal)	Phototank(s) are constructed of ordinary 1/4th inch plate glass (1/8th inch for front pane of small tanks) bonded together with clear silicone adhesive (be advised that ethanol will deteriorate silicon over time).
T2	Assemble tools and accessories	For field use, these essentials can be stored with the phototank and laptop in a crushproof and watertight carrying case that is suitable for carry-on luggage (Pelican case).	Accessories include: • 4-ply mat board in several background colors, • 3/16th inch foam board with flat black surface for camera blind, • glass cleaner,

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			• paper towels or lint-free cloth, • long and small forceps, • large metal binder clips, • 12-inch plastic or metal rulers, • stiff wire, • assortment of needles and insect pins, • calipers, • a system for tagging individual specimens.
T3	Retrieve specimen immobilization plate.	Each tank requires a separate glass plate to immobilize the subject. The free plate can be 1/8th (smaller tank) or 1/4th inch thick (larger tank) and slightly shorter and deeper than the inside dimensions of the tank (e.g., 13 × 10.25 and 15 × 12 inches). Plates should have smooth edges.	Specimen immobilization plate(s).
T4	Fill tank(s).	The tank should be filled with clear bottled or filtered and deionized tap water (or clean, fresh 70% ethanol or glycerin if working within the lab or collection) to minimize formation of air bubbles on specimen and glass. Stream or lake water (or original collection ethanol or glycerin) is unsuitable because it	Supply of clear bottled or filtered and deionized tap water, 70% ethanol, or glycerin.

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		lacks the desired clarity (suspended debris is a significant distraction in an otherwise good photo). Any water will accumulate debris over an extended photo session, and an ample supply of clean photo water must accompany extended forays.	
T5	Position lighting to tank or tank to lighting.	In the field, ambient lighting is utilized with the tank and hand-held reflectors oriented to maximize the even distribution of light and minimize glare and shadows on the subject. In the lab the phototank is stationed between two pairs of incandescent bulbs positioned to the side and slightly above the top of the tank. Polarizing filters are useful for reducing glare or overexposed hot spots on the specimen, particularly on the snout.	For field imaging: • reflector plates for directing light onto the subject. For lab imaging: • incandescent photo lamps, • lamp stands, • Hand-held polarizing filter.
T6	Retrieve camera.	The advantage of the D-SLR design and micro (macro) lens is the enhanced ability to reliably focus on very small specimens.	Digital SLR camera with capacity for 6× or higher zoom and 12 megapixels or higher resolution, preferably with ~60mm macro lens.

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T7	Fit camera to tripod, as necessary.	Fitting the camera to a tripod enhances stability, focus, and depth-of-field. T7 and T8 are repeatable adjustments.	Standard or mini-tripod (latter especially for field use).
T8	Fit camera lens through blind.	Fitting the camera lens through a flat black camera blind eliminates reflections of the camera and photographer from the resulting image.	Camera blind constructed of 3/16th inch foam board with flat black surface and circular orifice large enough to fit a camera lens through.

*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.

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