

Documenting Diversity II; Bringing the Studio into the Field for The Madrean Archipelago Biodiversity Assessment (MABA)

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The photography of small living animals by biologists in the field can be difficult. The process can be complicated by the need to work with a variety of subjects, and in a variety of locations and conditions. A compact, mobile studio setup allows the photographer to adapt common studio techniques for use in remote field locations.

“During the revolution Martín Luis Guzmán rode the train through Navojoa and looked over at the sierra and felt what we all do when we see its green folds rising up off the desert. We all wonder what is up there and in some part of us, that rich part where our mind plays beyond our commands, we all dread and lust for what is up there.”

-Charles Bowden, *The Secret Forest*

Introduction

Since 2009, the author has served as the primary photographer for the Madrean Archipelago Biodiversity Assessment (MABA), a multiyear series of biological field surveys in remote and rugged mountain ranges of Southern Arizona and Northern Sonora, Mexico. MABA expedition leaders establish central base camps, which may include as many as 40 biologists, naturalists, students, US and Mexican government and non-government organizations (NGOs), agency representatives, and camp helpers (cooks etc). From these camps, small teams disperse to spend the day exploring, and cataloging the various species of flora and fauna that fall within their specialty.

In addition to accompanying herpetologists into the field to capture photo vouchers of reptiles and amphibians, the author has been responsible for documenting herpetological and entomological specimens brought back to base camp by other teams of biologists working in the same mountain range. These small, vulnerable creatures must be photographed that same evening. The photographer may work late into the night so that captured animals may be returned to where they were found the next day and released unharmed, back into the environment.

The author made use of studio tools and techniques adapted for the field to facilitate the photography of these, varied, biological

specimens. This article will explore some of these tools and techniques used to document the amazing diversity encountered during MABA expeditions.

Materials

The biological field photographer must arrive prepared to photograph a wide variety of subjects under a number of, not always favorable, conditions. The photographer may be called upon to document the expedition travels, processes, and techniques. He or she may also be expected to capture images of biologists and others working in the field. They should also expect to catalogue the various habitat types encountered, plants and animals, large and small, including insects.

A nearly complete list of equipment taken along on MABA expeditions includes the following:

- Nikon D7100 24.1 MP
- Nikon D90 12.3 MP backup body
- Nikon 18-200mm zoom lens
- Nikon 12-24mm zoom lens
- Nikon 65mm and 105mm macro lenses
- Nikon 70-180mm macro-zoom lens
- Vivitar extension tubes
- Circular polarizing filter
- Nikon SB800 flash & SC28 cord
- Vivitar 283 flash (2)
- 10' PC cord
- Wein flash adapter
- Small Lumiquest soft box for SB800 & Vivitar 283 flashes
- LumiQuest Pocket Bouncer diffuser for SB800 & Vivitar 283 flashes
- Lepp Brackett and three Vivitar 252 flash units (1 spare)
- 12" Fotoflex light modifier/bounce card
- Acme-lite Compact light stands (2)
- Various studio clamps & brackets
- Clothespin type spring clamps (10) various sizes
- Ring stands (2) including one with a magnetic base
- Plastic aquaria (3) of varying sizes
- Clear plastic shoe boxes (2)
- Various plastic jars and vials
- Lazy Susan
- Foam board fill cards

- Battery operated LED modeling/work light
- 20"x24" Collapsible diffusion screen (home-made from PVC pipe and rip-stop nylon)
- Flash slave units
- 12" Forceps & miniature snake hook
- Gitzo Studex Tripod and ball head
- AA & AAA Batteries
- Gaffers tape, black, 1"
- Lens cleaning kit/tools
- 6" Plastic scale
- 12' Tape measure
- 2'x4' Folding table with adjustable legs

The bulk of the studio equipment, as well as some of the aquaria and animal containers, fit into a plastic case approximately 12"x22"x15". Camera equipment is placed in a backpack and carried in the cab of a truck for better dust protection.

Methods

The camp studio is based on a sturdy 2'x4' folding table with adjustable legs that allow it to be lowered to approximately 22".



Figure 1. A typical studio setup using a 2'x4' folding table, with adjustable legs, lowered to approximately 22". Tanajas Altas Mountains, Barry M. Goldwater Air Force Range, Arizona, USA.

A low table height is convenient for leaning over to photograph a specimen through the open top of an enclosure such as a plastic aquarium or shoe box (Figure 1).

The intended use of these images is to populate the MABA database (www.madrean.org), offered as a public resource for others studying these environs. Since the animals are alive and moving about in the enclosures, no attempt is made to capture a standardized pose. Rather, the photographer simply attempts to capture an image that faithfully represents the species and may include detail images, often when held by an assistant, that illustrate key characteristics of the species being photographed.

Basic lighting

The lighting setup used most often consists of a single Vivitar 283 flash shooting through a 20"x24" diffusion panel of rip-stop nylon (Figure 2). This creates a single, large, diffused light source which is positioned above and behind the subject. Foam board fill cards are arranged in front to reflect light back into the shadow areas. Backlighting the subject in this manner helps to separate it from the background and the large diffuser and fill cards control both highlights and shadows. The end result is a simple and pleasingly elegant effect, free of burned out highlights and foreboding shadows. The setup is easily adaptable, as dictated by the subject and lighting requirements.

Aquaria, plastic shoe box

A container of appropriate size and depth is used to contain the subject for photography; substrate and props are included to construct a more natural looking environment. The smooth, clear plastic sides will prevent many, though not all, subjects from escaping. Clear sides also permit lighting to be unencumbered by an opaque surface. Although plastic aquaria walls are unsuitable to photograph through, a glass aquarium is unlikely to make the journey, over rough four wheel drive roads, intact. For this reason, it is necessary to photograph through the open top of the enclosure.



Figure 2. The lighting setup used most often consists of a single Vivitar 283 flash shooting through a 20"x24" diffusion panel of rip-stop nylon. This creates a single, large, diffused light source, which is positioned above and behind the subject. Foam board fill cards are arranged in front to reflect light back into the shadow areas. Rancho El Pinito, Sierra San Luis, Sonora Mexico. (The Cuenca Los Ojos Foundation).



Figure 3. To show scale, a small 6" (15cm) plastic scale is included in an image. By placing the scale near the edge of the image, it may be cropped out later if desired. Rock horned lizard, *Phrynosoma ditmarsii*, Sierra la Púrica, Ajos-Bavispe National Forest, Sonora, Mexico.



Figure 4. Some subjects, such as millipedes and large beetles, may be photographed on flat rocks or pieces of bark and allowed to roam on the substrate placed directly on the table surface. The photographer simply picks up a wayward animal and gently places it back into position when they have wandered too far. Jeweled scarab, *Chrysin adelaida*, Rincón de Guadalupe, Sierra Bacadéhuachi, Sonora, Mexico.

Lazy susan

So that the photographer doesn't have to move around the table in an attempt to follow the animal as it moves about, the aquarium or plastic shoe box can be placed on a lazy susan, which can then be easily rotated.

Long forceps, mini snake hook

Long forceps and a mini snake hook may be used to help guide/arrange animals within their environment. The snake hook is constructed from a length of stout wire, and fashioned into a small hook, about 12" long. The mini snake hook, when used with forceps, can be used to arrange leaves, small stones and other props in the enclosure, as well as to gently maneuver an animal into a more pleasing position. It is imperative that extreme care be taken to file the ends of the wire hook perfectly smooth in order to prevent injuring the animals while being manipulated.

Ring stands

Ring stands provide a steady base to secure items such as small flash units or to which the photographer can attach branches etc. A stand with a magnetic base is useful; this can be secured to the tailgate of a truck during impromptu stops while out on the road.

Memory cards

Change the memory card each day, if possible, as this reduces the possibility of disaster should a memory card become corrupt or lost.

Showing scale

The author would strongly discourage the use of coins, packs of cigarettes, pocket knives and other assorted artifacts often inserted into images "to show scale". A small 6" (15cm) plastic scale takes up almost no room in the camera bag. Such a scale included in an image provides defined, useful information. By placing the scale near the edge of the image, it may be cropped out later if desired (Figure 3).

Understand your subject

"Put it in the refrigerator for a few minutes" is seldom, if ever, the correct answer to how to control your subject. Understanding the behavior and preferred conditions of your subject is a key to photographic success; talk to the experts on hand about this.

Wrangling techniques

When placed in the center of the enclosure, a piece of bark or cardboard provides cover, and may help calm an excitable subject, such as a centipede. By encouraging the animal to crawl underneath, they often feel safer in the dark, confined space. After waiting a moment, the cover is slowly removed with a pair of forceps as the photographer stands at the ready. Often the subject will remain in place, allowing a few exposures to be made before they become excited once again, and the process repeated.

More docile subjects, such as millipedes and large beetles, may be photographed on flat rocks or pieces of bark and allowed



Figure 5. To photograph very slow individuals, such as this snail, the substrate may simply be held in the non-dominant hand, and manipulated to capture the best lighting or view, while operating the camera with the dominant hand.



Figure 7. Burrowing snakes are generally photographed with very little substrate. The layer of ground material must be just enough to cover the bottom of the enclosure but not enough to allow the subject to hide from view. Smith's black-headed snake, *Tantilla hobartsmithi*, Rancho el Diablo, Arroyo Cajón Bonito, Sonora, Mexico



Figure 6. Small lizards will soon tire of racing about the enclosure and will eventually remain still for a few moments. During this time they may be gently arranged, using the “miniature snake hook” so that long tails are wrapped in front of the subject and included in the photograph in their entirety. Sonoran Spotted Whiptail lizard, *Aspidoscelis sonorae*, Rancho Los Alisos, Sierra Aconchi, Sonora, Mexico.

to roam on the substrate placed on the lazy susan or directly on the table surface. The photographer may simply pick up a wayward animal and gently place it back into position when they have wandered too far (Figure 4). To photograph very slow individuals, such as snails, the substrate may simply be held in the non-dominant hand, and manipulated to capture the best lighting or view, while operating the camera with the dominant hand (Figure 5).

Small lizards can be especially frustrating to work with, but will soon tire of racing about the enclosure and eventually remain still for a few moments. During this time they may be gently arranged, using the “miniature snake hook”, so that long tails are wrapped in front of the subject and included in the photograph in their entirety (Figure 6).

Fossorial, or burrowing, snakes are generally photographed with very little substrate. The layer of ground material must be just enough to cover the bottom of the enclosure but not enough to allow the subject to hide from view (Figure 7).

Large snakes and lizards may be photographed in the early morning; taking advantage of both the pleasing light and the cooler temperatures, in which they will be less active. This is most often done at their release site, so that should the animal suddenly become active and escape, there is no concern about them escaping into unfamiliar territory (Figure 8).

Conclusion

Photographic techniques that are typically used for table top studio photography can be adapted for use in the field. By utilizing a compact and portable studio setup, a few simple, home-made tools, and understanding animal behavior, excellent results can be attained.



Figure 8. Large snakes and lizards may be photographed in the early morning; this takes advantage of both the pleasing light and the cooler temperatures in which they will be less active. This is most often done at their release site so that, should the animal suddenly become active and escape, there is no concern about them escaping into unfamiliar territory. Green Ratsnake, *Senticolis triaspis*, Rancho el Pinito, Sierra San Luis, Sonora, Mexico.

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