

BCI Bat Conservation and Management Workshop – Portal, Arizona

May 29 – June 13, 2002 (Three 6-day, 5-night sessions)



The 2002 field season marks the 10th Anniversary year for BCI Bat Conservation and Management Workshops at the American Museum of Natural History's Southwestern Research Station near the tiny town of Portal, Arizona. This auspicious occasion was doubly significant for it was celebrated during BCI's 20th Anniversary Year. We've been netting bats in the Chiricahuas every May/June for exactly one half of our organization's life!

The festive year got off to a rocky start. Drought conditions prevailed throughout all of southeastern Arizona. This area usually receives almost 8 inches of winter rain, and by the time our workshop started on 29 May, we had only received just under 3 inches, with less than an inch falling since January. Conditions were crispy to say the very least. But, as our workshop staff knows, dry years generally mean that bats will be concentrated at the few remaining water holes, decreasing the amount of effort needed to encounter them. Unfortunately, this year we began to wonder if our few remaining water holes would dwindle to none by the third workshop session. To make matters worse, a severe forest fire broke out near Tucson the week before Labor Day. This prompted the USDA Forest Service to close the entire Coronado National Forest, including the mountain range surrounding our workshop location!

The closure took place the day before our first session was scheduled to start and we scrambled to find out if our Special Use permits would allow us to conduct our activities, or if we'd be turned back at the entrance to Cave Creek Canyon. But, as it turned out, the district hadn't decided what to do about the Special Use permit holders yet, so our workshop was granted a reprieve to conduct our studies, with the caveat that permits would be revisited on a weekly basis, every Monday, and our access could be revoked at any time.

Thus began bat camp, with no unauthorized activities allowed on USFS land (i.e., no running, no bird-watching, and no hiking), a heightened awareness of the tinder-dry conditions, and expectations for a banner year of bat netting – as long as we could find water!

MEET THE BATS OF CAVE CREEK CANYON

As our participants learned, the canyon is home to at least 20 different species of bats, representing three North American families. Early on in the workshop we studied ID keys and photos of diagnostic characteristics so we could sort through this fascinating fauna and begin to acquaint ourselves with the bats we hoped to encounter.

Cave Creek Canyon bats belong to one of three families, each having unmistakable characteristics: (1) The Phyllostomidae, or New World Leaf Nosed Bats, (2) The Vespertilionidae, or Plan Nosed Bats, and the (3) Molossidae, or Free-tailed Bats. We learned how to group unknown bats so we could easily identify certain characteristics and make confident species identifications. And, after just a single night netting and trapping, our participants formed definite opinions about their favorite species.



Almost everyone liked the docile Mexican free-tailed bats, *Tadarida brasiliensis*, who were a pleasure to remove from nets, and rather easy to identify. Our Session II group encountered an anomalous specimen



which they dubbed the “tail-free free-tail.” But even its lack of a tail didn’t confuse the identification crew for long.

The tiny western pipistrelle, *Pipistrellus hesperus*, was similarly popular with its tranquil behavior and lovely coloration; suede-like pale fur contrasting nicely with a black face mask of ears and muzzle and black opaque membranes.

The irrationally angry hoary bats, *Lasiurus cinereus*, were a hit with many participants who

admired their feisty natures, which was often announced with an unmistakable tick-tick-tick-hisssssss as soon as they blundered into a net. Others marveled at their densely furred and strikingly colored pelage and postulated that several hundred bats would make a mighty fine fur coat.

Then there were the six different *Myotis* species; each with subtle differences, each individual as confounding as the last when it came to correctly identifying them for some folks. Does it have a keeled calcar? Does it have hairy armpits? Is the thumb greater than or less than 4.2mm? Does it have a fringe of hairs on the tail membrane? Is there a bald spot on the back between the shoulder blades? Are the ears long and translucent? Does it smell like rancid butter?



LEARN ABOUT DAILY BAT CAMP ACTIVITIES



Cave Creek Canyon is a Nirvana-land for bats. There are few locations in North America where we can drive our vans less than 2-miles from the classroom, walk along a short trail, and view so many different types of bat roosting and foraging habitats without even breaking a sweat.

The craggy cliffs of the canyon hold a plethora of caves and crevices for numerous bat species, from the high, fast flying free-tails who prefer large cave

entrances to the tiny pipistrelles which like to wedge themselves into tight rock crevices. The vegetation on the canyon floor supports a diversity of tree-dwelling bats as well. The red, yellow, and hoary bats hang out amongst deciduous foliage, and the cavity-dwellers like silver-haired bats, southwestern myotis, and big brown bats can sometimes be found in woodpecker holes and under rugose bark. There are likely no housing shortages for bats in Cave Creek Canyon.

The creek winding through the canyon provides an excellent source of water and food for most of the resident bat species. As our participants can attest, numerous insect-hatches took place nightly from the riparian areas; sometimes from silty, still water and other times from ripply, rocky bottomed portions of the stream. The lush vegetation lining the creek, even where surface water wasn’t present, provided additional resources for a host of other insect-species, many of which were undoubtedly much sought-after bat food in turn!



Luckily, even in the severe drought conditions under which we conducted this year's work, we were able to find plenty of open water suitable for netting and trapping in the hopes of encountering the area's bats.

Before we could begin our evening activities, we returned to the station to practice deploying mist nets and harp traps. The daylight conditions and grassy station grounds helped participants become familiar with the unfamiliar gear and perplexing confusion of nets which can become all too easily tangled under more natural field conditions.

We also get to practice the art of radio-tracking forest bats. Workshop leaders hide a "practice transmitter" to simulate an actual roost selected by a tree-roosting species. Our group is split up into three teams who each try to locate the pseudo-bat to learn valuable lessons about back-azimuths, bounce, and how topography affects signal strength and direction. This year's "bats" were tracked to roosts under yucca fronds (like yellow bats might use), beneath bark (as would be used by a silver-haired bat) and in a vuggy rock pile (like a small *Myotis* could choose). Because we didn't encounter any real bats radio-tracking, we let our participants track themselves back to actual roosts identified during previous years including two *Myotis auricolus* maternity roosts from 1994 and 1995 and a 1996 bachelor roost for *Lasionycteris noctivagans*.



Between lectures and demonstrations to learn more about habitat assessment, threats to survival, habitat management, study techniques and status determination for bats, we took many other field trips into the local area to visit special attractions.



Chiricahua Crystal Cave, home to a maternity colony of Townsend's big-eared bats (*Corynorhinus townsendii*) is located just a short walk from our headquarters at the Southwestern Research Station. The cave is gated to protect the bats and is closed to visitation from April 15 through August 31 each year so the colony can rear its young in peace. Our group gets to view the gate and learn first hand about this history of cave management for this colony. A smaller cavern nearby, without bats, is open for visitation and offers our participants a glimpse of the conditions within the larger cave and provides a little "wild cave" experience to those who can't resist being underground. Our intrepid explorers find that temperatures in this cave, whose entire volume is below the entrance, are around 69F, too cool for bat maternity use, but comfortable for our participants who hiked over here under sunny skies and 90-degree temperatures.

A "Water-for-Wildlife" tank in a desert arroyo provides permanent water for a host of native wildlife, including many species of bats. The area was home to a historic, gravity-fed cattle tank, which due to flash-flooding in the nearby arroyo, fell into serious disrepair. A cooperative project several years ago between the local and federal and state land management agencies, restored the spring in the creek and installed a new tank that could once again fill with water. Regular maintenance assures that the tank remains accessible to bats. This year we will string our nets over the tank to see which bats are checking it out.

A volunteer-created wetland on State Line Road is also an essential open water source for many bats, including the high, fast-flying, less-maneuverable free-tailed bats. These bats could once obtain water at the Herb Martyr Dam near the Southwestern Research Station. But, forest fires in 1994 resulted in reduced groundcover and increased erosion during summer monsoons. Run-off from the denuded mountain-tops filled in the dam with silt and rubble. Now there is no room for water behind the spill-way, and the creek simply trickles in between the rocks and pours over the edge on its downstream journey.



FOLLOW US INTO THE FIELD EACH NIGHT

Night 1: Statue Cave, in South Fork of Cave Creek Canyon



Each year, “Bat Camp” begins with a trek into South Fork of Cave Creek Canyon to view “Statue Cave” and the possible emergence of several thousand *Tadarida brasiliensis*. This cave is so named because of the large monolith of rock at the entrance which at sometime over the years, someone for some reason painted white. The cave is also home to a transitory roost of presumably bachelor male and non-reproductive female Mexican free-tailed bats. In about 5 of the 10 years that we’ve been visiting the location, we’ve been able to witness the emergence of bats, looking like a thin ribbon of smoke rising above the cliff and streaming down the canyon. This year the bats did not perform, but we used

the time to good advantage by breaking out the bat detectors and listening to and looking at bats foraging above our heads as darkness fell.

Nights 2 through 4: Netting and Trapping along Cave Creek Canyon

Over the next four nights, we deployed ourselves and our gear along the creek in Cave Creek Canyon and at various other bat-rich locales around Portal. Despite the drought, there were many areas of the creek where springs bubbled close to the surface, and in an otherwise dry rocky stream bed, numerous watering holes were formed. We strung our nets and erected our Ausbat Harp Trap along these areas and intercepted the thirsty bats frequenting the area. We used various geometric combinations of mist-nets to try and thwart the amazingly clever and adeptly maneuverable bats as they navigated the streambed for a drink. Three 8-foot nets installed in a parallel configuration increased the chances that a bat detecting and popping over one net would tire of the exercise eventually and become entangled in the last net.



Before darkness fell it was disheartening to observe just how many bats were able to maneuver in between our nets, drink, and fly off, thumbing their noses at our efforts. Eventually though, as darkness fell, we began to catch plenty of bats and become proficient at untangling them while sloshing in



refreshingly cool water and being pestered by various insects beating their wings against our faces while being attracted to our headlamps. As any good bat biologist will tell you, bats are FAR easier to untangle from mist nets than are birds. (And any good ornithologist will counter with “Baloney! The bat biologists are absolutely, positively, and unequivocally wrong.”)

Participants really enjoyed using the harp trap as it seemingly vacuumed bats from the air and safely stowed them cozily in the canvas bag, awaiting discovery. Compared to the mist nets, trapped bats were easy to remove and gave our participants plenty of practice with handling and identification skills.

The secret to successful harp-trapping was to find an area of the stream where the fly-way was restricted by vegetation, creating a perfect harp-trap-sized (4.2m square) hole that the bats would have to fly through. Everyone knows that bats have super-sophisticated echolocation abilities and can detect an object the size of a human hair, just 2mm in length (right?) . . . obviously they could detect the fine wires on our harp trap. What we hoped they didn't know though was that the trap has a second bank of wires right behind the first and as they were twisting back to a horizontal flight path after passing vertically through the first bank of wires, they would be confronted with the second bank and fall harmlessly into the catch bag below.

In theory we should catch many of the bats that would evade our nets, in practice we probably only caught the intelligence-challenged bats that couldn't successfully navigate through both banks of wires or who had forgotten what a harp trap looked like in the year since we'd been trapping in the canyon. Proving once again, that everything we know about bats is based on the dumber members of the gene pool which allow themselves to be captured.



Night 2: Light-tagging Bats



Besides acoustic monitoring (i.e., using bat detectors), each night we demonstrated several other research techniques for studying bats. Here we've glued a tiny cyalume capsule to the back of a big brown bat to show participants how easy (or difficult) it is to illuminate a bat in order to study flight and foraging behavior. Sometimes, light-tagging of this type is used to track bats back to roosts. Our big brown bat selected a roost on the bark of an Arizona white oak, where he sat for several minutes trying to figure out what in the world he was doing with a glowing back pack. Eventually he zipped off and took a few laps around our group to get his bearings, before he ventured off down-canyon, trailing a green glowing light as he disappeared into the distance.

Light tagging makes a nice interpretive tool to show the public how quick and maneuverable bats are in flight. It can also be effectively used to record echolocation calls from free-flying, known species of bats. By tagging different species with different colors, each time a glowing bat comes by an echolocation monitoring station, the call can be recorded and stored with the correct species information. After turning our glowing bats loose, we sat on the road with our head lamps off and were treated to several passes from our erstwhile subjects. The ooooohs and aaaaaahs which ensued rivaled those emitted during Independence Day fireworks displays. (By 11pm, it takes very little effort to entertain budding bat biologists.)

Night 5: Netting at Willow Tank

We didn't want to give our participants the false sense of security that all bat netting and trapping involved was setting up in a peaceful canyon, over shallow water, where literally hundreds of bats foraged and flew each night. So, we took some of the more adventurous members of the group out to the desert to net "Willow Tank" a privately owned, man-made wetland (i.e., fenced off earthen cattle tank) with several acres of open water. Three 42-foot mist nets arranged in a "spoke



configuration” which participants dubbed the Mercedes Deployment (after the auto-maker’s logo), served to cover a goodly portion of the pond. Of course, participants were chest-deep in water as they removed bats, but their dedication was rewarded with captures of all three free-tailed bat species known from the area: *Nyctinomops femorosaccus*, *Nyctinomops macrotis*, and *Tadarida brasiliensis*, in addition to the ubiquitous *Lasiurus cinereus*, and *Pipistrellus hesperus*, among others.

By the end of the (early) evening, most tank-netters were quite soggy, and complained about the giant bullfrogs and ravenous tadpoles that alternately tried to make meals out of their toes. Thankfully though, nobody had to practice their bird-netting skills by removing a great blue heron from the nets.

Night 5: Netting at the Southwestern Research Station Pool

And, for the quasi-adventurous (i.e., those participants who didn’t mind deep-water netting, as long as there were no bullfrogs the size of dinner plates and carnivorous tadpoles to nibble toes), we netted the Southwestern Research Station’s spring-fed, cement-lined, once-weekly cleaned, swimming pool. What looks like an impromptu nocturnal water-ballet practice is actually a team of participants removing a free-tailed bat from a 30-foot net stretched over the “shallow” end of the pool. (Interesting bat-netting trivia: The SWRS Pool holds the state record for number of bats and species caught from a single location. Of course, this is largely because string nets over the pool and relaxing on the grass or picnic tables (within easy commute to the refrigerator) is less effort than trucking all manner of bat netting gear into a remote watery section of the canyon.)



Night 5: Viewing Nectar Bats with Night-vision Equipment

We wrapped up Bat Camp 2002 by spying on thirsty nectar-feeding bats as they visited the ubiquitous humming-bird feeders strung up throughout Cave Creek Canyon. By using night-vision equipment we can observe bats flying to and from feeders without affecting their behavior by shining bright lights on them. The infra-red illumination used to spot-light a hummingbird feeder is invisible to the bats (and to non-night vision scope using humans) and they maneuver around the cone of light undisturbed. Our night scopes intensify the ambient light, including the infra-red portion, and we get a crystal clear, albeit green, image of the area.

All too soon, it is time to pack up our gear and head home with memories of our nocturnal forays and a better appreciation for the erstwhile secret world of bats.



THE SEASON IN REVIEW

Despite the forest closure, the lack of water, and the unseasonably hot and dry conditions, Bat Camp 2002 was a resounding success in Arizona. We caught 1,143 individuals of 19 species during 12 nights of netting (228 net/trap hours).

The only species absent from our inventory this year was the western yellow bat (*Lasiurus xanthinus*). The severe drought conditions did not appear to be negatively affecting the bats. For the most part, all were quite healthy and robust in appearance and the summer colonies of reproductive species seemed to be doing quite well.

We encountered pregnant and lactating individuals of the following species: *Choeronycteris mexicana*, *Corynorhinus townsendii*, *Eptesicus fuscus*,

Lasiurus blossevillii, *Myotis auriculus*, *Myotis californicus*, *Myotis ciliolabrum*, *Myotis thysanodes*, *Myotis velifer*, *Myotis volans*, *Pipistrellus hesperus*, and *Tadarida brasiliensis*.



In addition we caught record numbers of *Idionycteris phyllotis* (26 individuals) and *Lasiurus blossevillii* (15 individuals). We didn't have a single incidental mortality during the netting and trapping activities; another testament to the generally healthy state of the bat populations in the area.

The water tank at Silver Creek remains an excellent resource for bats (and other wildlife). It was full (though we did salvage a drowned bat from the tank; probably a western pipistrelle, the skull is being prepared to confirm identification), and the flight path to the tank was markedly improved since a nearby juniper was removed. This is evidenced by the fact that for the first time we caught hoary bats (*Lasiurus cinereus*) and silver-haired bats (*Lasiionycteris noctivagans*) over the tank; two species that generally need larger fly-ways in order to drink.

Our course was held at the Southwestern Research Station near Portal in the Chiricahua Mountains. Thirty participants from 15 U.S. states and two foreign countries (Mexico and Indonesia) attended the course. Participants represented 5 federal agencies, 9 state agencies, three universities, 2 consulting firms, 1 zoo, and 5 non-governmental organizations.



Special thanks to Jon Jasper, USDI National Park Service, Timpanogos Cave National Monument in Utah, for the most excellent photos he contributed to this update.

For more information about BCI's workshops, please contact Education and Workshops Coordinator, Kari Gaukler (workshops@batcon.org), 512-327-9721. Learn more about the workshops on BCI's website: www.batcon.org