



# Skunk Biology

To most people, the word “skunk” conjures up a host of thoughts, none of which are good. Who would want to work with those? The answer is that at least some biologists do.

Over the past 20 years, biology faculty have amassed a world-class systematic compilation of skunks, numbering over 400 specimens, for the Angelo State Natural History Collections. Part of the odd attraction we have to skunks is that Texas is home to all five species that occur in the United States. The striped skunk, *Mephitis mephitis*, is the common one that everyone knows. The other four are either less common, or occur only in the southwestern states.

Eastern and western spotted skunks, *Spilogale putorius* and *S. gracilis*, are also called civet cats and at least one of the two is found in most areas of Texas. The hog-nosed skunk, or rooter skunk, *Conepatus leuconotus*, used to occur across the southern half of the state, but the eastern form is likely gone from the area near the Big Thicket of Texas.

Around San Angelo and points further west, the hog-nosed skunk is less common than the striped skunk,

but shows up regularly as roadkill. The last Texas species is the hooded skunk, *Mephitis macroura*, an animal common through much of Mexico, but decidedly uncommon in Texas, with the only records from the Trans-Pecos area. Few recent records exist of this species in the state.

## Skunk Day

So how does one get students to salvage or collect specimens of skunks, or worse, prepare study skins of these odoriferous mammals? The answer is to turn it into a party of sorts. We call it “Skunk Day” and it comes around once or twice a year.

We round up faculty and students willing to help and head out to some site just outside of town. Dr. Dixon and Dr. Ammerman have previously volunteered their properties, but usually we end up in an out-of-the-way place near Twin Buttes Reservoir where there are few observers. We take everything we need, including all the skunks that have accumulated in our freezers, skinning equipment and supplies, buckets for washing the skins, tables, chairs and liquid nitrogen for the tissues.

The winter months are best as the temperatures stay bearable during the afternoons, something unlikely in July or August. The result of more than a decade of Skunk Days is a wonderful assemblage of skunk specimens from much of Central and West Texas. *(continued on next page)*



## Skunk Research

Four of our recent graduate students have completed thesis research on some aspect of skunk biology. Jeff Doty, now in a research position at Colorado State University, worked on den site selection in western spotted skunks. Sean Neiswenter, now a Ph.D. student at the University of Nevada-Las Vegas, worked on both the endoparasites of skunks and habitat differences between striped and spotted skunks. Carla Ebeling, now with Pandion Systems Inc., tested detection methods for all three skunk species using camera traps and tracking plates. Gema Guerra has been investigating the genetic variability and phylogeography of the western spotted skunk (*Spilogale gracilis*) based on mitochondrial DNA sequences from specimens in Mexico, Arizona, California, New Mexico and Texas.

Our research on skunks is continuing with a collaborative study by Robert Dowler, Adam Ferguson and Terry Maxwell to utilize roadkill surveys for establishing the relative abundance of skunk species near San Angelo. They are driving a 100-mile circuit twice a month and recording all road-killed mammals. To date, after two months of surveys, they have recorded 159 road-killed mammals (not including deer) of 13 species, including 44 striped skunks and eight hog-nosed skunks. After gathering data for a year or so, they should have a good idea about the species in this part of Texas and the seasonal pattern in skunk mortalities on highways.

Lastly, Dowler, Ferguson and Jerry Dragoo (at the University of New Mexico) have begun work on a book about the skunks of Texas. As part of this project, they are assembling all records of skunks in the state, including museum specimen records. If you know of specimens in museums that they might have missed, please contact Dowler at the ASNHC (robert.dowler@angelo.edu or 325-942-2175, Ext. 239). They are also seeking volunteers willing to photograph and record road-killed specimens of skunks throughout the state.

# Asbestos Forces ASNHC Move

A small pile of dusty debris found atop a lab bench in August disrupted classes and the collections throughout the fall semester.

The Cavness Science Building was constructed using the best available technology, which in 1967 meant abundant asbestos. Over the subsequent years, there have been several waves of asbestos removal from the classrooms, offices and a computer lab. The fragments found this summer were an omen of another wave of abatement.

San Angelo had a wet year in 2007. By October we had already received 150 percent of our average annual rainfall. The moisture and increased humidity caused some of the ceiling to crumble, an insulating layer that had been stable for decades. After a series of inspections and the threat of being completely closed down, an abatement schedule was arranged.

The abatement process required that all unsecured equipment and furniture be moved out for one week and all work surfaces and

permanent fixtures be cleared off. In the Herbarium and adjacent rooms, all of the specimen cases and equipment were moved into the halls or temporarily stored in an adjacent lab. The cases in the bird and mammal collections were left in place, but all of the mounted heads, skulls and skeletons had to be moved.

Physical plant personnel, students and faculty assisted in the move. There were no casualties among either students or specimens.

Make sure you have plenty of help if you are ever asked to move a mounted giraffe or African buffalo!



Carson Brown, Charles Sibesta and Travis Fisher return the giraffe to its place in the collection after asbestos abatement.

## Specimen Counts

<b>Plants</b>	<b>ca. 60,000</b>
<b>Amphibians and Reptiles</b>	<b>14,244</b>
<b>Birds</b>	<b>2,188</b>
<b>Mammals</b>	<b>13,338</b>
<b>Tissues</b>	<b>7,160</b>

## ASNHC Tours:

School groups continue to enjoy the collections in conjunction with our Science Days program and individual class field trips. During the last four years, over 4,000 school children from the surrounding area have participated in programs at the ASNHC.

# Curator Profile: Dr. Bonnie Amos

Bonnie Amos has lived most of her life in the Concho Valley, spending only brief stints away for academic and professional pursuits. She received both her Bachelor of Science and Master of Science degrees in biology from Angelo State University, then earned her Ph.D. in botany from the University of Oklahoma under the direction of Dr. James Estes. She taught for six years at Baylor University before returning to ASU in 1987. Shortly after arriving back at ASU, she took on the duties of department head and held the position for 13 years.

While an undergraduate student at ASU, Bonnie was introduced to the Chihuahuan Desert by her mentor, Dr. Chester Rowell. That area remains one of Bonnie's great loves and she considers herself very fortunate for the opportunities she has been given to study plants there. Her first "real" botanical study in the desert was a floristic survey for Big Bend National Park, which produced a list of the park's vascular plants.

At the request of the U.S. Fish and Wildlife Service, Bonnie stayed in the desert and attempted to better define the distribution of perhaps one of the rarest morning glories, the Big Pod Bonamia (*Bonamia ovalifolia*, Convolvulaceae). Her study, assisted by other students, evolved into a master's thesis investigation of the plant's reproductive biology and pollination ecology with principal investigator Christie Adkins. (Christie is now a lecturer of biology at ASU and remains very active in plant studies.)

Several additional projects were also developed by other undergraduate biology students from the bonamia study. Sara Johnson (Ph.D. in botany from the University of Texas) looked at the heterogeneity of what was then the only known population of the flower. Traesha Robertson (Ph.D. in plant ecology from Texas Tech University) and Ginger Brininstool (Ph.D. in botany from Louisiana State University) used electrophoresis to compare *B. ovalifolia* with another desert dweller, *Bonamia repens*.

Perhaps spurred to the mountains of Big Bend after several years of working in the hot lowlands, Bonnie and graduate student Paula

Hall (Ph.D. in botany from the University of New Mexico) repeatedly climbed Big Bend's tallest mountain, Emory Peak, to study the little known Chisos Pinweed (*Lechea mensalis*, Cistaceae) and gather data for part of Hall's master's thesis.

But, Bonnie could not stay away from the desert for long. Next up for her and several of her students was an investigation of the threatened Chisos Mountain Hedgehog Cactus (*Echinocereus chisoensis*, Cactaceae) for Big Bend National Park. The study lasted several years and grew exponentially, with numerous add-on projects involving many student helpers.

Undergraduate Chris Vassiliou (now Dr. Vassiliou) and Bonnie began by studying the reproductive biology and pollination ecology of the cactus. Undergraduates Sam Lightsey (now Dr. Lightsey), Mark Pournier (now teaching in the Woodlands) and Jason Neil (now working for the U.S. Department of Agriculture in Alaska) were frequent helpers with the plant's reproductive biology. They also conducted their own projects with more in-depth investigations of the pollinators and seed dispersal.

Joshua Kornegay (currently in medical school) identified the floral attractants (caloric value of the pollen and pollen amino acids) of *E. chisoensis* and compared them with co-flowering cacti. Sandra Anaya (now working for Homeland Security in Boston) expanded the study to include the sugars in the floral nectar. Kera Gineva, who has since returned to Bulgaria, lugged a "portable" spectrophotometer through the desert to compare the light reflectance and absorption patterns of the flowers of *E. chisoensis* with its neighboring cacti.

Jeff Masters (currently a lecturer at ASU who continues to provide great help with botanical ventures) joined the fray by using electrophoresis to compare genetic diversity of the separated populations of *E. chisoensis*. Sontee Dastidar (now in the botany Ph.D. program at the University of Texas) and Phil Choi (soon to enter medical school) attempted to compare the genetic diversity among the populations using DNA techniques.



Dr. Bonnie Amos

Bonnie and the rest of the plant crew then joined Joe Sirotnak, Big Bend National Park botanist, and Kathy Rice of Desert Botanical Garden in a long-term project to reintroduce the Chisos Mountain Hedgehog Cactus at a site in the park.

Another area of Bonnie's research is centered on the endangered Texas Poppy Mallow (*Callirhoe scabriuscula*, Malvaceae). Primary topics include the pollination ecology, reproductive biology and seed germination requirements. In addition, students have looked at the genetic heterogeneity of the isolated populations (Denise Coulter's master's thesis) and described the seed bank (Patty Cruze's master's thesis). More recently, Leah Lawdermilk and Michael Martinez (assisted by Dr. Nick Flynn, ASU Department of Chemistry and Biochemistry) analyzed and compared the floral attractants of the Texas Poppy Mallow with its common co-genitor, the wine cup (*C. involucrata*).

In addition to building and maintaining an electronic database for the Herbarium, Bonnie continues to insist on accompanying students into the field (albeit moving more slowly). She discovers potential new projects with each trip and believes that no profession could be better. So many plants...so little time!

# Grants & Awards

## Kudos - Grants

### Bonnie Amos

Texas National Guard Grant for “Camp Bowie Hill Country Wild Mercury Mapping Project,” \$29,970, 2006-08.

Texas National Guard Grant for “Camp Bowie *Argythamnia aphoroides* Natural History Project,” \$42,000, 2005-07.

Mitchell County Board of Economic Development Grant for “Reintroduction of the Texas Poppy Mallow,” \$15,000, 2006-08.

### Loren Ammerman

ASU Research Innovation Grant for “Using DNA Sequence Data to Determine Relationships Within the Free-Tailed Bat Family,” \$86,210, 2008.

ASU Research Enhancement Grant for “Use of DNA Fingerprinting Technique (AFLP) to Resolve Conflict Between Datasets in *Myotis* Bats,” \$9,922, 2007.

ASU Research Enrichment Grant for “Thermal Cycling Equipment for Gene Amplification and DNA Sequencing,” \$4,995, 2006.

ASU President’s Circle Grant for “Tracking Andean Speciation Events in the Free-Tailed Bats of Eastern Ecuador,” \$3,000, 2006.

ASU Research Enrichment Grant for “Genetic Sampling of Museum Specimens,” \$1,952, 2006.

Texas National Guard Contract (with Robert Dowler) for “Bat Survey of Texas National Guard Sites,” \$64,795, 2005-07.

ASU Research Enhancement Grant for “DNA Sequence Variation in the Bonneted Bat (*Eumops glaucinus*),” \$10,000, 2005.

USDA Grant (with Robert Dowler, subcontract with Sul Ross State University) for “Field Survey of Small and Medium-Sized Mammals of the Rio Grande Corridor,” \$24,731, 2004-06.

North American Bat Conservation Partnership Grant (with Tom Kunz at Boston University) for “Test of a New Census Method to Count *Leptonycteris nivalis*,” \$5,000, 2004-06.

### Robert Dowler

ASU Research Innovation Grant for “Captive

Management of Galápagos Rodents as a Safeguard to Extinction,” \$6,000, 2008.

Texas Parks and Wildlife Department Grant for “A Survey of Mammals of Bentsen Rio Grande Valley State Park,” \$1,000, 2007.

ASU Research Enrichment Grant for “Expansion of Galápagos Island Rodent Research,” \$9,113, 2007.

ASU Research Enrichment Grant for “Conservation Status of Skunks and Weasels in Texas,” \$2,400, 2006.

Texas National Guard Grant for “Survey of the Mammals, Reptiles and Amphibians of Camp Bowie,” \$31,105, 2006 (co-principal investigator with Michael Dixon).

## Kudos - Student Grants & Awards

**Jason Strickland** received a \$300 research grant from Tri-Beta in 2007 to study population demographics of the western cottonmouth.

**Chris Snow** received a \$4,000 annual scholarship from the Houston Safari Club in 2007.

### Gema Guerra, Carson Brown, Adam Ferguson, Dana Lee and Molly McDonough

received Texas Academy of Science Student Research Awards ranging from \$500-\$1,500 in 2006-08.

### Carson Brown, Gema Guerra and Adam Ferguson

received Carr Research Awards in 2006-07.

**Kiran Chawla**, recipient of a Carr Research Scholarship, is investigating the reproductive biology of *Argythamnia simulans* (Euphorbiaceae) in Brown County.

**Carson Brown** was the recipient of American Society of Mammalogists Grants-in-Aid in 2006 and 2007 for a total of \$2,890 toward his project on genetic variation in the endangered Mexican long-nosed bat (*Leptonycteris nivalis*). He also received an American Museum of Natural History, Theodore Roosevelt Memorial Fund Grant of \$1,640 for this project.

**Molly McDonough** received a McCarley Award from the Southwestern Association of Naturalists in



Installing drift fence array at Camp Bowie near Brownwood, Texas (Adam Ferguson, Jason Strickland, Robert Dowler, Molly McDonough, Johnny Spencer, Mike Dixon).

2006 for her thesis project on genetic variation in *Eumops glaucinus*. She was awarded \$1,000 for her research from the Head of the River Ranch Fund. She also received awards from the Texas Academy of Science and Texas Society of Mammalogists for her oral presentations that same year. She has since successfully defended her thesis “Genetic and Morphological Variation in Wagner’s Mastiff Bat, *Eumops glaucinus*, and its Closest Relative *Eumops floridanus* (Chiroptera: Molossidae).”

## Kudos – Faculty Awards

**Bonnie Amos** was awarded the Teaching Excellence Award at ASU for 2008.

**Terry Maxwell** was named a Piper Distinguished Professor for 2007 by the Minnie Stevens Piper Foundation in recognition of his outstanding achievements in the teaching profession. In addition to this prestigious award, Maxwell received the 2006 Teaching Excellence Award at ASU and the Distinguished Science Faculty Member Award from the ASU Alumni Association in 2004. ASU students also voted him the Outstanding Science Faculty Member in 2004.

**Robert Dowler** received the 2005 Distinguished Faculty Achievement Award for the College of Sciences from the ASU Alumni Association.

# Around the Collections

**Bonnie Amos** and several students (David Sullivan, Brandy Hall, Kelly Usrey, Bridget Feldhaus, David Palmer and Kiran Chawla) are currently working on various projects. They are completing a study of the reproductive biology and pollination ecology of the Hill Country Wild Mercury (*Argythamnia aphoroides*) at Camp Bowie in Brown County. During that investigation, they have discovered a sympatric population of *A. aphoroides* and *Argythamnia simulans*, another Edwards Plateau endemic. They will continue investigating the reproductive isolation mechanisms between these two *Argythamnia* species this spring. In addition, they are using GIS to analyze habitat preference and distribution of *A. aphoroides* at Camp Bowie. They are also assisting the Mitchell County Board of Economic Development with a reintroduction project of the Texas Poppy Mallow (*Callirhoe scabriuscula*, Malvaceae).

**David Palmer** is studying the pollination ecology and seed ecology of a population of the Hill Country Wild Mercury in Tom Green County with Bonnie Amos.

**Jason Strickland** is studying the population demographics of the western cottonmouth moccasin (*Agkistrodon piscivorus leucostoma*) at the western limit of its range on the South Conch River. This two-year study is being supervised by Kelly McCoy.

**Chris Snow's** thesis work is an evaluation of various indices for estimating abundance of scaled quail in West Texas. He is also working on a quantitative avifaunal study of the Rolling Plains Quail Research Ranch. These studies are supervised by Dale Rollins and Terry Maxwell.

**Robert Dowler and Adam Ferguson** are collecting data from museum and voucher specimens and incorporating them into an amendable geospatial database in an attempt to establish long-term trends in skunk populations for all five species historically found in Texas. Using ArcGIS and spatial analysis, they plan on analyzing patterns in skunk distribution in relation to habitat features, roadways and urban interfaces in an attempt to examine historical changes in distribution of these Texas carnivores.

**Robert Dowler** is continuing research on the endemic rodents of the Galápagos Islands. In 2007 he examined specimens at the U.S.



ASU students Adam Ferguson, Molly McDonough and Gema Guerra and Robert Dowler with specimens collected during a trip to Morelos, Mexico, January 12, 2007.

National Museum, American Museum of Natural History and the Field Museum. In addition, he is collaborating with Dr. Dan Wharton of the Chicago Zoological Society to establish a breeding colony of the Santiago rice rat, *Nesoryzomys swarthi*, at the Brookfield Zoo. Captive management of this species may serve as a safeguard in case the species becomes extinct in the wild.

**Dana Lee** is using amplified fragment length polymorphisms to investigate the taxonomy of the Davis Mountains Cottontail, *Sylvilagus robustus*, with Loren Ammerman.

**Richard Dolman** is studying the phylogenetics of the bat genus *Nyctinomops* with Loren Ammerman.

**Nick Kincaid and Robert Dowler**, are studying the morphological characteristics of *Spilogale putorius* and *S. gracilis* in an attempt to create a system for differentiating the two species and identifying hybrid animals.

**Jason Strickland** is conducting a survey of the mammals of Gaines County, Texas, with Robert Dowler.

**Gema Guerra** is completing her thesis project on the genetic variation in the western spotted skunk, *Spilogale gracilis*. She is advised by Loren Ammerman and Robert Dowler.

**Loren Ammerman** is working with David Schmidly and Christine Hice at the University of New Mexico on a revision of the book "Bats of Texas" to be published by Texas A&M Press.

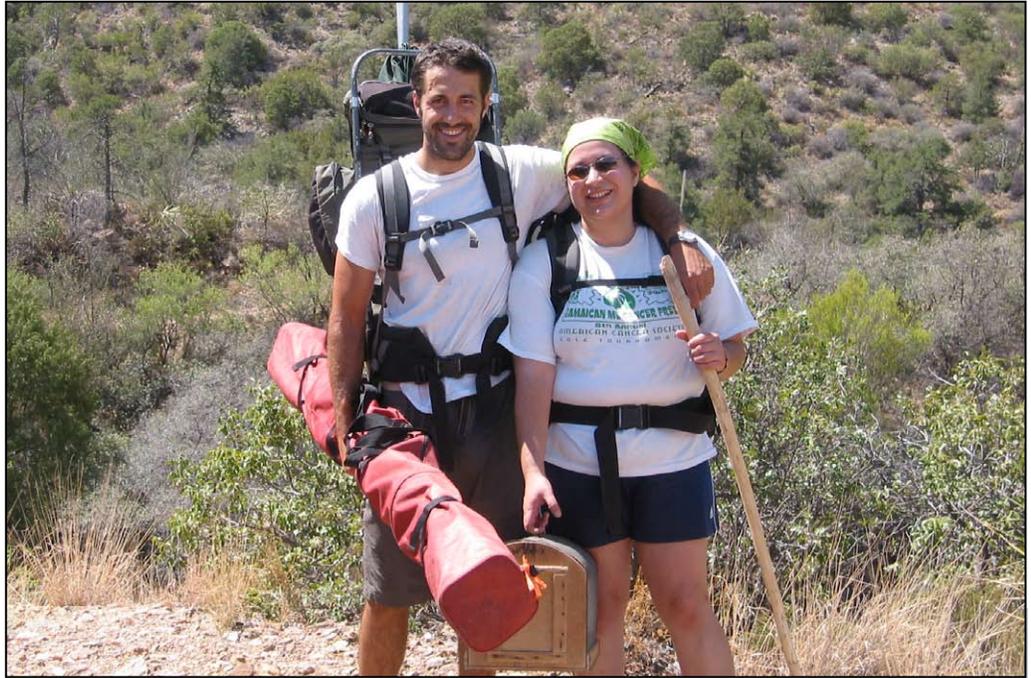
**Loren Ammerman and Dana Lee** are working with Russell Pfau at Tarleton State University using amplified fragment length polymorphism (AFLP) data to resolve conflicts between morphological and mitochondrial data sets in two bat species, *Myotis ciliolabrum* and *M. californicus*.

**Loren Ammerman, Molly McDonough, Adam Ferguson and Carson Brown** traveled to eastern Ecuador to inventory and collect bat specimens, primarily for projects on molecular systematics in Molossidae. A total of 375 bats were captured and 165 specimens collected. This work was conducted in collaboration with Pontificia Universidad Católica del Ecuador.  
(continued on next page)



Ben Froggé at his study site checking ringtail nest boxes.

**Ben Froggé** is a Carr Scholar studying the habitat preferences and nest box use of ringtails, *Bassariscus astutus*, with Robert Dowler.



Graduate students Carson Brown and Gema Guerra returning from a night of collecting wing punches from Mexican long-nosed bats (*Leptonycteris nivalis*) for population genetic analysis of this endangered species.



Mexican Long-Nosed Bat

**Carson Brown** is working on two projects entitled “Sexual Segregation and Community Composition: A Seasonal Perspective on the Bats of the Chisos Mountains, Big Bend National Park” and “Genetic Variation in the Endangered Mexican Long-Nosed Bat (*Leptonycteris nivalis*): Implications for the Conservation of an Endangered Species.” He is advised by Loren Ammerman.

## Loans

A total of 268 specimens (skins and skulls), 37 hair samples and 172 tissues were loaned to researchers at 17 institutions in the last four years. Some of the institutions using ASNHC specimens include the Field Museum, Purdue University, University of Miami, Texas Tech University, Brigham Young University, Western Michigan University, University of Nevada-Las Vegas and the Royal Ontario Museum. Loans were also made to the animal science program at ASU.



ASU students, faculty and alumni at the American Society of Mammalogists meeting in Albuquerque, N.M., in June 2007. (Darin Carroll, Cody Edwards, Marcy Revelez, Carla Ebeling, Andy Crosby, Loren Ammerman, Molly McDonough, Roger Rodriguez, Adam Ferguson, Robert Dowler, Sean Neiswenter, Amy Bishop)

The ASNHC also loaned 78 teaching collection specimens to Sul Ross State University-Del Rio.

In addition, a specimen of *Nesoryzomys fernandinae* and one *N. swarthi* collected in the Galápagos Islands by Robert Dowler were permanently deposited in the U.S. National Museum-Smithsonian.

Individuals interested in tissue or specimen loans are encouraged to visit our Web site, <http://www.angelo.edu/dept/biology/asnhc.html>.

# Recent Publications

## 2004

Dexter, N., R. C. Dowler, J. P. Flanagan, S. Hart, M. A. Revelez and T. E. Lee. 2004. The Influence of Feral Cats (*Felis catus*) on the Distribution and Abundance of Introduced and Endemic Galápagos Rodents. *Pacific Conservation Biology* 10(4):210-215.

Rodriguez, R. M. and L. K. Ammerman. 2004. Mitochondrial DNA Divergence Does Not Reflect Morphological Difference Between *Myotis californicus* and *Myotis ciliolabrum*. *Journal of Mammalogy* 85:842-851.

## 2005

Ammerman, L. K. 2005. Noteworthy Records of the Eastern Pipistrelle (*Perimyotis subflavus*) and Silver-Haired Bat (*Lasionycteris noctivagans*) (Chiroptera: Vespertilionidae) From the Chisos Mountains, Texas. *Texas Journal of Science* 57: 202-207.

Kasner, A. C., T. C. Maxwell and R. D. Slack. 2005. Breeding Distributions of Selected Charadriiforms (Charadriiformes: Charadriidae, Scolopacidae, Laridae) in Interior Texas. *Texas Journal of Science* 57:273-288.

Rodriguez Castro, J. H., A. C. Sandoval and N. E. Strenth. 2005. Gastrópodos Marinos de Tamaulipas. Pp. 88-96 in: Barrientos Lozano, et al., eds. Biodiversidad Tamaulipeca Vol. 1. Instituto Tecnológico de Cd. Victoria.

## 2006

Ammerman, L.K. 2006. High-Tech Bat Counts: Tapping the Promise of Thermal Imaging. *BATS* 25(2):10-12.

Brant, J. G., R. C. Dowler and C. E. Ebeling. 2006. The Mammals of San Angelo State Park. Occasional Papers, Museum of Texas Tech University 265:1-18.

Debelica, A., A. K. Matthews and L. K. Ammerman. 2006. Dietary Study of Big Free-Tailed Bats (*Nyctinomops macrotis*) in Big Bend National Park. *Southwestern Naturalist* 51(3):414-418.

Doty, J. B. and R. C. Dowler. 2006. Denning Ecology in Sympatric Populations of Skunks (*Spilogale gracilis* and *Mephitis mephitis*) in West-Central Texas. *Journal of Mammalogy* 87(1):131-138.

Dowler, R. C. 2006. (Review) Mammals of the Lone Star State-The Mammals of Texas (revised edition) by David J. Schmidly. *The Prairie Naturalist* 37(4):255-256.

Neiswenter, S. A., D. Pence and R.C. Dowler. 2006. Helminths of Sympatric Striped, Hog-Nosed and Spotted Skunks in West-Central Texas. *Journal of Wildlife Disease* 42(3):511-517.

## 2007

Correa-Sandoval, A., N. E. Strenth and M. Salazar Rodriguez. 2007. Zoogeografía de los Gastrópodos Terrestres del sur de Nuevo León, México. *Acta Zoologica Mexicana* (n.s.) 23(2):143-162.

Ferguson, A.W. 2007. *Masticophis schotti schotti* (Schot's Whipsnake) Diet. *Herpetological Review* 38(3):341.

Ferguson, A. W. and M. T. Dixon. 2007. *Elaphe guttata emoryi* Diet. *Herpetological Review* 38(3):340

Keith, S. E. and B. B. Amos. 2007. Playing Fields and Rare Plants: A Winning Combination. *Recreational Sports Journal* 31(1): 21-25.

McAllister, C. T., C. R. Bursley and R. C. Dowler. 2007. *Acanthatrium alicatai* Macy, 1940 (Trematoda: Lecithodendriidae) From Two Species of Bats (Chiroptera: Vespertilionidae), in Southwestern Texas. *Southwestern Naturalist* 52(4):597-600.

Neiswenter, S.A. and R.C. Dowler. 2007. Habitat Use of Western Spotted Skunks and Striped Skunks in Texas. *Journal of Wildlife Management* 71(2):583-586.

## Thank You

The ASU Natural History Endowment continues to grow and is now in excess of \$28,200. Recent additions include a contribution by Dr. Charles Endress in memory of Dr. Gordon Creel. Other donations were made by Mrs. Edith Boulware and the Philia Club in honor of Dr. Terry Maxwell. Louis Fohn contributed funds for research. Dr. Robert Lynn donated back issues of *The Southwestern Naturalist* and Ms. Terry Richmond donated books for the ASNHC library. We especially thank Benchmark Research for the ultralow freezer for our tissue collection.

## Recycle Your Cell Phones and Printer Cartridges for the ASNHC

We have begun a recycling program for cell phones and printer cartridges to raise funds for the ASU Natural History Endowment. If you have old cell phones or empty printer cartridges, keep them out of the landfill and help the ASNHC. Contact Robert Dowler at robert.dowler@angelo.edu for more information.

# Significant Additions

## Mammals

In the last few years, several important additions have been made to the Collection of Mammals. A field survey of Booderee National Park in Australia resulted in salvaged specimens of an echidna, several bandicoots, ring-tailed possums, wallabies and antechinus. An expedition to Morelos, Mexico, added several specimens of the hooded skunk, *Mephitis macroura*, as well as some important rodents and bats. Voucher specimens from research in Brewster County, Texas, on mammals of the Rio Grande corridor were also added to the ASNHC. A recent field trip for the mammalogy class collected mammals for a survey of Bentsen Rio Grande Valley State Park on the Rio Grande River. This trip resulted in the addition of several species of rodents found only in far south Texas. From the San Antonio Zoo, we salvaged specimens of African and Asian elephants, Sumatran tigers, tamandua and several species of primates, among other mammals. We also arranged for two specimens of Florida manatees and two black-footed ferrets to be deposited in the ASNHC.

## Amphibians and Reptiles

During a year-long stay at Angelo State University, Dr. Chris McAllister collected a two-headed rattlesnake, which is now deposited in the Collection of Amphibians and Reptiles. This and other specimens were reported in a paper that ran in a 2006 issue of *Journal of the Arkansas Academy of Science* titled "Discovery of a Dicephalic Western Diamondback



Ben Frogg , Carla Ebeling and Robert Dowler conducted a survey of mammals at Booderee National Park in Australia in 2005.

Rattlesnake, *Crotalus atrox* (Serpentes: Viperidae), From Texas, With a Summary of Dicephalism Among Members of the Genus *Crotalus*." Voucher specimens from a survey of Camp Bowie National Guard Training Facility near Brownwood, Texas, were also added to the ASNHC.

## Herbarium

A recent exchange with the Herbarium of the University of Texas-El Paso added about 150 specimens to our collection. This is the

most recent of several exchanges in what has been a lucrative relationship for both herbaria. We also received a series of 50 specimens in exchange with the University of New Hampshire. Plant taxonomy classes in the Department of Biology over the last several years have also added hundreds of specimens to the ASNHC Herbarium.

# In Memory

## Dr. Gordon C. Creel 1926–2005

Gordon Creel was head of the Biology Department from 1965 until 1970. He retired in 1983. He was instrumental in the founding of the natural history collections through active participation and administrative support.

## Ford M. Boulware 1913–2007

Ford Boulware was the son of a pioneer ranching family in the Concho Valley. With his wife, Edith, and son, Ryland Howard, he managed the Head of the River Ranch on the South Concho River. The family is a major supporter of the natural history program, teaching and research at ASU.

## Dr. Wilmot A. Thornton 1921–2008

W. A. (Bill) Thornton was a faculty member of the Biology Department from the late 1960s until 1983. He was the initial curator of the mammal, bird and herpetology natural history collections. Before retirement he was most active in *Sylvilagus* cottontail systematics.

**The ASU Natural History Collection Endowment accepts donations in recognition of the contributions of these important founders and supporters of our program.**