



ASNHC

Angelo State Natural History Collections

May 2010

Belize

Never let it be said that the ASNHC curators are not on the move.

Dr. Bonnie Amos, Herbarium curator, returned from Europe in the first week of August 2009 and within three days was airborne again – destination Belize. One of her graduate students, David Sullivan, returned from a summer study abroad program in Europe at the same time, and jumped on that same flight to Belize.

The project that prompted their visit to the Central American country is a first for the ASU Biology Department. Armed with Amos' background in plant taxonomy and floristics and David's hands-on experiences in Belize, they explored the feasibility of a Mayan ethnobotany project. The proposed project initially has everything going for it. Not the least in its favor is that David is married to Marisol, a Mayan, and has unique access to that culture's practitioners of traditional medicine.

The Chan and Masewal Maya are little studied. Their oral traditional knowledge of the hundreds of medically useful plant species is in danger of being lost. How one applies these plants to the treatment



Marisol Sullivan and Bonnie Amos gathering field supplies at an Orange Walk market in Belize.

of different human ailments and what to expect in a regimen of treatment is simply a dying knowledge. Amos and the Sullivans are hoping to block that approaching loss.

Their brief two weeks in Belize were dedicated to testing data collection techniques. They interviewed native medicos and videotaped the interviews. They visited a national park with

Don Beto Cocom, who maintains the Masewal Maya Jungle Garden that harbors plants he uses to practice traditional medicine. This was a shake-down trip, and the results were promising.

Belize is a tropical biological treasure house. Conservation of its biota is a Belizean national goal, and Amos and Sullivan are planning to do their part by documenting Chan and Masewal Maya ethnobotany. You can feel their excitement when they describe their first excursion. Who knows where this project might lead? If determination were all it needed, then there is no limit.



David Sullivan collecting data in a forest near Orange Walk, Belize.

Thank You

Our profound thanks go out to all who contributed to the ASU Natural History Endowment, including Royce Ballinger, Edith Boulware, William R. Carr, Mary Creel and family (donating in memory of Drs. Gordon Creel and Wilmot Thornton), Jim Hindman, Cindy Pond, Lynn Simpson, Hugh Stone, Ned Strenth (in memory of Dale G. Dowler) and Ben Stribling.

We would also like to thank everyone who donated specimens to the Mammal Collection, including Gary Byers, who donated a black bear skull from Alaska; Ruffin Brent and J. R. Canard, who called with western spotted skunk specimens from Bandera County and Kimble County, respectively; Richard Brown, who salvaged a road-killed hog-nosed skunk; Louis Fohn, who brought in a road-killed badger; Dan Brown for specimens of beavers; and Adam Batot and the Wee "b" Rockin' Ranch, who donated the skull of an onager, or Asiatic wild ass.

Thanks also to Dr. Robert Timm for a donation of publications for the ASNHC library, and to Edith Boulware, Ryland Howard, Drew Sykes and Sandra Tweedy for use of their ranches for research and teaching associated with the Angelo State Natural History Collections.

Specimen Counts

Plants	ca 70,000
Amphibians and Reptiles	14,271
Birds	2,188
Mammals	14,002
Tissues	14,000 vials (ca 7,500 individuals)

ASNHC Tours

During each academic year, the ASNHC provides programs for about 1,300 area fourth graders during ASU Science Days. Over the past three years, curators Dr. Robert Dowler and Dr. Terry Maxwell have presented programs in the ASNHC to high school students from across the state as part of the Youth Veterinary Science Workshop. Local San Angelo business leaders toured the ASNHC through the Leadership San Angelo program. ASU master's graduate Shamone Minzenmayer brought her Environmental Science class from Central High School for a tour of the ASNHC to illustrate biodiversity. In February of 2010, the public was invited to an open house for the ASNHC, during which Dr. Kelly McCoy gave a presentation entitled "You Can Learn a Lot from a Lizard, If You Ask the Right Questions."

Study Abroad at Europe's Great Museums

Curators Dr. Terry Maxwell and Dr. Robert Dowler led a group of 24 ASU students to Great Britain, France and Germany last summer. On the four-week trip, the group studied the history of biology and the role of natural history museums in the biological sciences. Students visited the British Museum of Natural History in both London and Tring, the Museum of Zoology in Cambridge, Darwin's home in Downe, Kew Gardens, Musee' National d'Histoire Naturelle in Paris, and the Museum für Naturkunde in Berlin, among others. One highlight was visiting the village of Eichstaedt, Germany, with a side trip to look for fossils near Solnhofen, the site where the world-famous fossils of *Archaeopteryx* were found. The group was excited to see the original specimen of that fossil on exhibit at the Humboldt Museum in Berlin.



ASU study abroad students with Drs. Maxwell and Dowler at the Musee' National d'Histoire Naturelle in Paris.

Curator Profile: Dr. Loren Ammerman

The newest division of the ASNHC is the Tissue Collection and its curator is also the newest one in the ASNHC – Dr. Loren Ammerman. She has the responsibility for one of our most active collections.

The Tissue Collection began 30 years ago under the guidance of Dr. Mark Engstrom, who is now at the Royal Ontario Museum in Toronto. Today, Ammerman oversees 14,000 tubes of tissue representing about 7,500 individual animals. In case you are wondering where the responsibility is, know that in the past two years, Ammerman has fielded requests for tissues from 10 institutions, including Texas A&M University, Texas Tech University, Oklahoma State University, Universidad Nacional Autonoma de Mexico and the Royal Ontario Museum in Canada.

Most use of tissues is for molecular systematics, the field which employs genes to clarify the evolutionary relationships among groups of animals. ASU's Tissue Collection is now one of the big players in the field, and Ammerman sees that the tissues are stored properly, catalogued correctly and dispersed efficiently to scientists in a research-responsible manner.

A native of Spring, Texas, Ammerman's early ambition was to be a wildlife veterinarian, and she began the academic preparation to that effect with two years at Austin College and then completion of a B.S. in Wildlife and Fisheries Sciences at Texas A&M. While at A&M, a course in molecular genetics thrust her in a new direction – one from which she has not looked back.

Ammerman went on to complete a Ph.D. in the laboratory of Dr. David Hillis at the University of Texas at Austin. Her doctoral work tested the hypothesis that two major lineages of bats – megachiropterans and microchiropterans – were each other's closest relatives. The Hillis lab also exerted another influence on her life. There she met fellow graduate student and future husband Michael Dixon. They now have two wonderful children, Jamie and Leanne.

Both Ammerman and Dixon began their academic professional careers in 1992 at Texas Wesleyan University. Ammerman moved to UT-Arlington in 1994 and ultimately to ASU in 2000.

Her research passion is bats, although she is willing for students to broaden her vision. Graduate students Dana Lee and Amy Vestal Nalls pursued rabbits with definitive projects on species limits in the Davis Mountains Cottontail, *Sylvilagus robustus*. Dawn Weir's project examined enterotoxin genes in *Staphylococcus caprae*, Candace Frerich examined bovine virus genotypes and Gema Guerra studied genetic variation in western spotted skunks. Bats, though, occupy most of Ammerman's intellectual drive.

While still at UT-Arlington, Ammerman guided a student, Jana Higginbotham, who studied the bat community structure in Big Bend National Park. Another of her students, Rogelio Rodriguez, transferred to ASU to complete his studies of two bat species, the Western Small-Footed Myotis, *Myotis ciliolabrum*, and the California Myotis, *M. californicus*.



Dr. Loren Ammerman

Ammerman's long-term personal research project is molossid bat molecular systematics. Molly McDonough, Richard Dolman and now Marie Tipps have or are taking on subsections of this large overall problem. Ammerman now has tissue from all the worldwide genera that are possible to obtain, and her initial big goal is to publish the first molecular phylogeny of Molossidae (the family of free-tailed bats). An early notable success has been the discovery and naming, in cooperation with colleagues at Texas Tech University, of a new species – *Eumops wilsoni* – from Andean South America.

Additional student projects have been on conservation genetics of the endangered Mexican long-nosed bat, *Leptonycteris nivalis* (Carson Brown), and diet of the free-tailed bats *Tadarida brasiliensis*, *Nyctinomops femorosaccus* and *N. macrotis* (Amanda Matthews Neiswenter and Anica Debelica).

Ammerman's arrival at ASU has been a win-win situation all around. Generous ASU internal grants have kept her and her students funded, and the opportunity to work with a large tissue collection fits her perfectly. The Biology Department's stature in the research world has grown with the successes and awards earned by her students. We look forward to more.

Mission

The mission of the Angelo State Natural History Collections is to:

- Provide a permanent, well-maintained, active reference collection of the world with an emphasis on the flora and fauna of the Concho Valley and surrounding areas.
- Provide a learning laboratory for ASU students to facilitate and encourage research and education.
- Promote awareness, understanding and appreciation of global biodiversity.
- Contribute specimens and data for study by research scientists around the world.

Grants & Awards

Faculty Grants

Dr. Loren Ammerman

- ASU Faculty Development Grant – “Census of the Endangered Mexican Long-Nosed Bat Using Thermal Imaging,” July 2009, \$5,949
- ASU Faculty Innovation Grant – Museum research for her book, “Bats of Texas,” May 2008, \$10,000
- Faculty Innovation Grant – “Using DNA Sequence Data to Determine Relationships within the Free-Tailed Bat Family,” 2007-09, \$86,210

Dr. Bonnie Amos

- Completed project – “Camp Bowie Hill Country Wild Mercury Mapping Project,” Texas National Guard, \$29,970
- Completed project – “Camp Bowie *Argythamnia aphoroides* Natural History Study,” Texas National Guard, \$42,000
- Continued research – “Mitchell County Texas Poppy Mallow Reintroduction Project,” Mitchell County Board of Economic Development

Dr. Robert Dowler

- ASU Faculty Development Grant – “Curation and Expansion of the Collection of Mammals,” Angelo State Natural History Collections, January 2009, \$3,998
- James A. “Buddy” Davidson Charitable Foundation Grant – “Wildlife Biology in West Texas: Ecology of Medium-Sized Carnivores,” September 2008, \$45,000
- ASU Research Innovation Grant – “Captive Management of Galapagos Rodents as a Safeguard to Extinction,” January 2008, \$6,000
- Texas Parks and Wildlife – “Survey of Mammals of Brazos Bend State Park,” October 2009, \$1,200

Student Grants

2008

- **Dana Lee** – Texas Academy of Science Student Research Grant, “Taxonomic

Status of the Davis Mountains Cottontail, *Sylvilagus robustus* (Lagomorpha: Leporidae) Revealed by Amplified Fragment Length Polymorphism,” \$1,500, Faculty mentor: Loren K. Ammerman

- **Jason L. Strickland** – Tri-Beta Research Grant, “The Western Cottonmouth (*Agkistrodon piscivorus leucostoma*) in West Texas: The Demography, Geographic Variation, and Venom Collection in an Extreme Population,” \$740, Faculty mentor: J. K. McCoy

2009

- **Wesley A. Brashear** – Texas Academy of Science Student Research Grant, “Natal and Maternal Den Site Selection in the American Hog-nosed Skunk,” \$500, Faculty mentor: Robert C. Dowler
- **Marie Tipps** – Tri-Beta Research Grant, “A Molecular Approach to the Phylogenetic Position of *Cheiromeles* (Molossidae: Chiroptera),” \$650, Faculty mentor: Loren K. Ammerman
- In 2008 and 2009, the following students were supported by Carr Student Research Scholarships: **Wes Brashear, Robbie Heischman, Jason Strickland, Dana Lee, Richard Dolman and Marie Tipps.**

Student Awards

2008

- **Richard Dolman** won the Basically Bats Award for his poster “Molecular Systematics of the Genus *Nyctinomops*” at the North American Symposium on Bat Research in Scranton, Penn.
- **Adam Ferguson** received the William B. Davis Award from the Texas Society of Mammalogists for his presentation “Hog-Nosed Skunks (*Conepatus leuconotus*) in Texas: A Current Assessment.”
- **Gema Guerra** won third place for her presentation “Phylogeography of Western Spotted Skunks Based on Cytochrome-B DNA Sequence” at the Texas Academy of Science meeting in Corpus Christi.
- **Dana Lee** received the Karl Koopman Award for Best Presentation at the North

American Symposium on Bat Research in Scranton, Penn., for her presentation “Using Amplified Fragment Length Polymorphism to Evaluate Patterns of Genetic Divergence among *Myotis californicus*, *M. ciliolabrum*, and *M. leibii*.”

- **Jason L. Strickland** won third place at the Tri-Beta South Central Regional Convention for his presentation “A Study of the Demography of the Western Cottonmouth Moccasin (*Agkistrodon piscivorus leucostoma*) at the Western Limit of its Range.”

2009

- **Wesley Brashear** won the Rollin H. Baker Undergraduate Award at the Texas Society of Mammalogists meeting for his presentation “Home Range and Den Site Analysis of the American Hog-Nosed Skunk, *Conepatus leuconotus*.”
- **Dana Lee** was named the Distinguished Graduate Student for the College of Sciences.
- **Dana Lee** won the TSM award for Best Systematics Oral Presentation at the Texas Society of Mammalogists meeting for her paper “Taxonomic Status of the Davis Mountains Cottontail, *Sylvilagus robustus* (Lagomorpha: Leporidae), Revealed by Amplified Fragment Length Polymorphism.” She presented the same talk at the Texas Academy of Science meeting and received first place for Best Graduate Presentation.
- **Jason Strickland** received first place for Best Undergraduate Oral Presentation at the Texas Academy of Science meeting, and the first place Brooks Award at the Tri-Beta South Central Regional Convention, for his presentation “The Western Cottonmouth (*Agkistrodon piscivorus leucostoma*) in West-Central Texas: The Demography and Venom Collection in a Peripheral Population.”
- **Marie Tipps** received the John C. Johnson Poster Award at the regional Tri-Beta meeting for her project “Optimizing PCR Conditions in DMP1 for Phylogenetic Analysis of Molossid Genera.”

Presentations and Publications

Faculty and Student Presentations

2008

- **Loren K. Ammerman and Michael T. Dixon.** "Monitoring Changes in the Bat Community of the Big Bend Region: Trends over the Last 40 Years." Texas Parks and Wildlife Department Wildlife Diversity Conference, Houston Zoo.
- **Loren K. Ammerman, Carson M. Brown, Rodrigo A. Medellin, A. Moreno-Valdez and Russell S. Pfau.** "Genetic Variation and Structure in the Endangered Mexican Long-Nosed Bat, *Leptonycteris nivalis*: Mitochondrial and Nuclear Perspectives." North American Symposium on Bat Research, Scranton, Penn.
- **Loren K. Ammerman, Dana N. Lee and Russell Pfau.** "Resolving Conflicts Between Morphological and Mitochondrial DNA Datasets in Myotis Bats." American Society of Mammalogists, Brookings, S.D.
- **Bonnie Amos.** "Reproductive Biology of the Endangered Texas Poppy Mallow and its Cost to Conservation." Botanical Society of America Symposium: How Understanding Rare Species' Reproductive Biology Can Influence Conservation, Vancouver, Canada.
- **Robert C. Dowler, Carla E. Ebeling and Adam W. Ferguson.** "Conservation Status of Skunks in Texas: Filling in the Gaps." Texas Parks and Wildlife Department Wildlife Diversity Conference, Houston Zoo.
- **Robert C. Dowler, Carla E. Ebeling and A. W. Ferguson.** "Strategies for Monitoring Skunk Populations in Texas." American Society of Mammalogists 88th Annual Meeting, Brookings, S.D.
- **Carla Ebeling, Robert C. Dowler and Adam W. Ferguson.** "Comprehensive Strategy for Monitoring Skunk Populations in Texas." Southwestern Association of Naturalists 55th Annual Meeting, Memphis, Tenn.

- **Susan E. Keith and Bonnie Amos.** "Creative Collaboration – Community Recreation and Rare Plant Conservation." Texas Recreation and Park Society.

2009

- **Loren K. Ammerman, Dana N. Lee and Marie Tipps.** "Molecular Phylogeny of the Family Molossidae." North American Symposium on Bat Research, Portland, Ore.
- **Wesley Brashear and Robert Dowler.** "Home Range Analysis of the American Hog-Nosed Skunk, *Conepatus leuconotus*." Southwestern Association of Naturalists 56th Annual Meeting, Monterrey, Mexico.
- **Wesley Brashear and Robert Dowler.** "Home Range and Den Site Selection in the American Hog-Nosed Skunk, *Conepatus leuconotus*." American Society of Mammalogists 89th Annual Meeting, Fairbanks, Alaska.
- **Robert Dowler.** "Following Darwin's Path: Rodent Research in the Galapagos Islands." rEVOLUTION Symposium in celebration of Charles Darwin, University of Central Oklahoma.
- **Kayla Ehrman.** "How Sweet It Is: A Comparison of Nectar Sugars in Two Endemic Species of *Argythamnia*." Beta Beta Beta Regional Conference.

Faculty Awards and Honors

Bonnie Amos

- 2009 ASU Alumni Association Distinguished Faculty Achievement Award
- 2009 Faculty Who Make a Difference Award from the ASU Athletic Department
- 2009 Texas Plant Conservation Award from the Lady Bird Johnson Wildflower Research Center at the University of Texas at Austin
- 2009 Minnie Stevens Piper Professor designation
- 2008 ASU nominee for U.S. Professors of the Year Program

- 2008 ASU Teaching Excellence Award

Robert Dowler

- Dr. Dowler was recently elected as president-elect of the Southwestern Association of Naturalists at its annual meeting in Monterrey, Mexico.
- Dowler was honored by having a new species of coccidian protozoan from a bat named for him--*Eimeria dowleri*. The new species was described in the paper: McAllister, Chris T. and Steve J. Upton. 2009. Two New Species of *Eimeria* (Apicomplexa: Eimeriidae) from Eastern Red Bats, *Lasiurus borealis* (Chiroptera: Vespertilionidae), in Arkansas and North Carolina. Journal of Parasitology 95(4):991-993.

Recent Publications

2008

- **Ammerman, Loren K., Rogelio M. Rodriguez, Robert C. Dowler and Molly M. McDonough.** 2008. Bat Diversity and Activity: A Comparison among Texas Army National Guard Sites. Texas Tech University Occasional Papers 280:1-23.
- **Dowler, Robert C., Carla E. Ebeling, Gema I. Guerra and Adam W. Ferguson.** 2008. The Distribution of Spotted Skunks, Genus *Spilogale* in Texas. Texas Journal of Science 60(4): 321-326.
- **Ferguson, Adam W.** 2008. Chasing Our Smelliest Furbearer South of the Border. Texas Fur Trails, January Issue, p. 11.
- **McDonough, Molly M., Loren K. Ammerman, Robert M. Timm, Hogh H. Genoways, Peter A. Larsen and Robert J. Baker.** 2008. Speciation within Bonneted Bats (Genus *Eumops*): The Complexity of Morphological, Mitochondrial, and Nuclear Datasets in Systematics. Journal of Mammalogy 89 (5):1306-1315.

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Recent Publications Continued

2009

- **Ammerman, Loren K., Molly M. McDonough, Nickolay I. Hristov and Thomas H. Kunz.** 2009. Census of the Endangered Mexican Long-Nosed Bat (*Leptonycteris nivalis*) in Texas Using Thermal Imaging. *Endangered Species Research* 8:87-92.
- **Baker, Robert J., Molly M. McDonough, Vicki J. Swier, Peter A. Larsen, Juan P. Carrera and Loren K. Ammerman.** 2009. New Species of Bonneted Bat, genus *Eumops* (Chiroptera: Molossidae) From the Lowlands of Western Ecuador and Peru. *Acta Chiropterologica* 11:1-13.
- **Correa-Sandoval, Alfonso and Ned E. Streth.** 2009. First Record of *Cymbovula acicularis* (Gastropoda: Prosobranchia: Ovulidae) from the Coast of Tamaulipas, México. *Texas Journal of Science* 61(1):67-72.
- **Correa-Sandoval, Alfonso, Ned E. Streth, Rubén Rodríguez Castro and Jorge Víctor Horta Vega.** 2009. Análisis Ecológico Básico de los Gastrópodos Terrestres de la Región Oriental de San Luis Potosí, México. *Acta Zoologica Mexicana (n.s.)* 25(1):105-122.



ASU faculty and students attending the Southwestern Association of Naturalists Annual Meeting in Monterrey, Mexico, in April of 2009. From the left, they are: Jason Strickland, Ned Streth, Rigel Rilling, Loren Ammerman, Adam Ferguson and Robert Dowler. (Not shown but also attending were Guillermo Hernandez and Jay Packer.)



Students in the 2009 mammalogy class surveyed the mammals of Brazos Bend State Park near Richmond, Texas, with Dr. Robert Dowler and former student Carla Ebeling. Dr. Duke Rogers of Brigham Young University (center) collected blood and tissue samples for zoonotic disease surveillance.

Around the Collections

David Sullivan, Marisol Sullivan, Christie Adkins and Bonnie Amos

conducted a pilot study in the summer of 2009 on "Medicinal Plants of the Masewal and Chan Mayans of Belize." This work will be developed by Sullivan as his thesis project under the supervision of Dr. Amos.

Hollie Laqua began her thesis project, "Reproductive Biology and Pollination Ecology of *Argythamnia simulans*," with adviser Dr. Bonnie Amos.

Jason Strickland entered the graduate program in August of 2009 and began work on his thesis project, "Analysis of Phylogeographic Variation among Texas Cottonmouths, *Agkistrodon piscivorus*, Using Nuclear AFLP Markers and Venom Protein Profiles." He collected many of his samples the preceding summer and has been

generating data on venom proteins with the assistance of Dr. John Osterhout in the Chemistry Department. Strickland's study focuses on populations on the westernmost edge of the distribution of cottonmouths. His objective is to measure and compare the patterns of variation observed in the nuclear markers to those seen in venom proteins. His advisers are Dr. Loren Ammerman and Dr. J. Kelly McCoy.

Dr. Loren Ammerman, curator of tissues, approved loans from the frozen tissue collection for 16 different projects in 2008-09 (for a total of 331 tissues). These



Graduate student Jason Strickland is studying the ecology and systematics of water moccasins, *Agkistrodon piscivorus*.

loans went to 14 individuals at 10 different institutions: Oklahoma State University, University of Central Oklahoma, San Francisco State University, Texas Tech University, Trinity University, University of Nevada-Las Vegas, Texas A&M University, Royal Ontario Museum, Angelo State University and Universidad Nacional Autónoma de México. The collection continues to grow and our ultra-cold freezer is reaching capacity!

Dr. Loren Ammerman, Austin Osmanski, Cody Webb and James Dixon conducted a census of the endangered Mexican

long-nosed bats found in Big Bend National Park using an infrared thermal imaging camera. This technique allows the bats to be recorded in complete darkness because their body heat creates an image that is recorded and saved to a laptop computer. These recordings can be used to count the number of individuals leaving their cave. There were at least 3,200 bats by their census in July of 2009. This work was funded by an ASU Faculty Development Grant.

During August of 2008, **Dr. Robert Dowler**, Dan Wharton, senior vice president for animal programs at the Brookfield Zoo in Chicago, and Marilyn Hoyt traveled to the Galapagos Islands to study the nutritional aspects of diet in the Santiago native rodents, *Nesoryzomys swarthi*.

In June of 2009, **Dowler, Wesley Brashear, Adam Ferguson and Molly McDonough** collected

mammals in Alaska through arrangements with Dr. Link Olson and Brandy Jacobsen of the University of Alaska Museum in Fairbanks. They then attended the annual meeting of the American Society of Mammalogists in Fairbanks.

Dowler, Brashear, Duke S. Rogers, Andrew Tiedt, Eric Pomposelli, Emily Wilkinson and students in the mammalogy class conducted a survey of the mammals at Brazos Bend State Park in October of 2009.

ASU Natural History Endowment

The ASU Natural History Endowment was begun in 1998 with the purpose to grow funds that eventually will support the management of the Angelo State Natural History Collections and research by students and faculty. The endowment is now more than \$32,000 and has seen consistent growth over the past decade. Your donations to this endowment will help future students and faculty conduct research and help maintain and improve the ASNHC. An envelope for donations accompanies this newsletter, or you can contact the ASU Development Office directly at www.angelo.edu/services/giving/donors.html.



Dr. Loren Ammerman and Richard Dolman prepare a thermal infrared camera to record emerging Mexican long-nosed bats in Big Bend National Park. The special camera was used to estimate the population size of this endangered bat species.

Recycling Your Cell Phones and Printer Cartridges Can Also Help the ASNHC

A new program to recycle cell phones, ink jet printer cartridges and laser jet cartridges was begun in 2008. Proceeds from this recycling program have already generated over \$1,400. If you live in the Concho Valley, please

consider bringing your used printer cartridges and cell phones to Room 109 of the Cavness Science Building on the ASU campus. If you would like more information, please contact Robert Dowler at (325) 486-6639.



Jason Strickland and Dr. Kelly McCoy collect data on a captured water moccasin.



Dr. Robert Dowler with a native Galapagos rodent on the island of Santiago during field studies in 2008.