

Southwest Section Newsletter

Spring 2023 - Vol. 14 Issue #1

President's Message

Kay Nicholson - 2023 President SW Section of The Wildlife

I am honored and humbled to serve as president of the Southwest Section this year. I would like to thank Whitney Gann and Jimmy Cain for their leadership and guidance over this past year as I was learning the ropes on how the Section's board operates. Jimmy will transition off the board now and Whitney will take on the past-president role. I'd like to welcome Nicole Tatman as a new addition to the board. She was voted in as this year's president-elect. Congratulations Nicole! I'm happy to welcome back Erika Nowak and Masahiro Ohnishi as the Southwest Section's treasurer and secretary, respectively. I'm looking forward to working with all of you this year!



It was fantastic to get together again in person for the Arizona/New Mexico Joint Annual Meeting in February for the first time since 2020. While it was great to have the option for Zoom meetings the past 2 years so folks could still gather virtually, it was wonderful to see everyone in real life this time. There is just a different energy when you are actually there to be able to see and interact with everybody in 3D.

I have been told by others who have served before me as president of the Southwest Section that it is best to focus on one main objective or goal for the year. I have decided to focus on fostering more of an interconnection amongst our members. Our chapters do a great job of networking with each other during their annual meetings, but it would be great if we could broaden that reach to connect our members throughout the full geographic extent of our Section. During the Arizona/New Mexico Joint Annual Meeting, a suggestion was made to provide funds for a member from each chapter to attend the other chapter's annual meeting. If you have any other ideas for how we can better help our Section members to network with others, please feel free to reach out to me (kay.e.nicholson@jacobs.com). I'd be happy to discuss your suggestions with the rest of the board.

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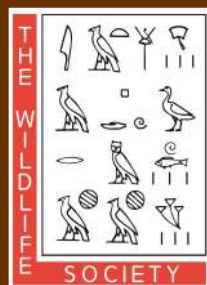
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Kay Nicholson - 2023 President SW Section of The Wildlife

I would like to take a moment to acknowledge some of the benefits the Southwest Section provides to students. This past year, the board approved providing funding for up to three students from each state of Arizona, New Mexico, and Texas to attend their annual chapter meetings. This is a great opportunity for budding scientists to present research in a professional setting, network with peers, and connect with potential employers. Additionally, the Southwest Section provides an annual \$500 graduate student scholarship. This past year we had some excellent applications to review, and we were pleased to award the scholarship to Natalie Hamilton. You can read more about Natalie's research in her article on page 8. If you are currently a graduate student, consider applying for the scholarship award this year. The deadline to apply is December 15th so you still have plenty of time to work on that application!



Spring bluebonnets and snow in Big Bend National Park. Photo courtesy Onalise Hill

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Kay Nicholson - 2023 President SW Section of The Wildlife

Before I close out this message, I would like to put out a request to all members. Please consider sharing an article for this newsletter. It is always great to hear what our colleagues are doing throughout the Southwest. And because I'm asking that from you, I will share a little bit about what I am working on currently.

I am a consultant biologist, so my role as I see it is to protect biological resources in a world that faces ongoing development, resulting in habitat loss and destruction as well as other effects to wildlife. Today, I am protecting fish in the Virgin River from impacts associated with a bridge replacement. The bridge is old and needs to be replaced to ensure it is safe for us to drive on, but there are federally listed fish that could be present in the river. My crew is excluding fish from areas that could be unsafe for the fish when construction activities take place near the river. I am also working with engineers to design a roadway project in southwestern Utah in desert tortoise habitat to identify the best locations to install tortoise crossings. The intent is to allow as much permeability as possible and reduce the effects of habitat fragmentation that would be caused by the road. In addition to two 1,000-foot-long bridges in the areas of highest tortoise densities, we identified 19 tortoise-specific crossing structures that are proposed in the early design plans for this 4-mile-long road.

In other parts of the country, I am working on an airport wildlife hazard assessment for a small airport in northwestern Minnesota, and soon I will be embarking on preconstruction surveys to identify potential impacts to birds, bats, and federally listed species for offshore wind projects. Now go... it's your turn! We would love to hear from you!

-- Kay Nicholson

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Thank you to those that contributed to this newsletter: **Kay Nicholson, Kathy Granillo**, Matt Hewitt, Nicole Dickan, Amanda Veals Dutt, Heather Zimba, Karen Gaines, **Sara Weaver, Bryan Bird**, and **Kerry Baldwin**.

We need photos and/or articles from YOU!

Please contribute to the next newsletter. Consider submitting articles or photos on work related adventures, conservation happenings, or any topics of interest to Southwest Section members. If you're interested in contributing but don't know what to write, give us a call!

Deadline for the Spring newsletter articles is **March 1st**.
Deadline for the Fall newsletter articles is **September 30th**.

Submit all photos and articles to your newsletter editor(s).



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Southwest Section Tracks

Kathy Granillo - Southwest Section Representative To Council

Spring is one of my favorite times of the year. The days are getting longer, flowers are blooming, birds are singing, and the frigid days of winter are gone. The first official day of Spring this year in the Northern hemisphere is March 20. This date marks the vernal equinox, which occurs when the Sun crosses the celestial equator going south to north. Here's an interesting fact: equinoxes are the only two times each year that the Sun rises due east and sets due west for all of us on Earth. Many ancient cultures marked the equinoxes. One of the most famous ancient Spring equinox celebrations took place at Chichen Itza in Mexico. The Mayans built a huge pyramid around the year A.D. 1000. To this day, the way the Sun's light falls on it signals the beginning of the seasons. On the spring equinox, it looks like a huge snake is slithering down the steps. Mayans called this day "the return of the Sun serpent."



Speaking of Mexico, we are getting much closer to making a Mexico TWS Chapter a reality. There are some last legal hurdles to clear, and we are hopeful that this year will mark the establishment of the chapter. As you know, Mexico is part of the Southwest Section and formation of the chapter will be an avenue to even more cooperation between biologists and managers in our shared wildlife resources.

Many members might think of TWS as primarily a U.S. or North American organization, but TWS has had an international presence for decades. The TWS International Wildlife Management Working Group's Recommendations for International Engagement 2020 – 2030 summarized TWS's history as follows:

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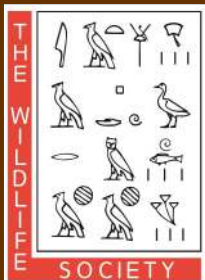
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Southwest Section Tracks

Kathy Granillo - Southwest Section Representative To Council

An international membership committee was established in 1946, led by Aldo Leopold, and the Society began the practice of appointing representatives to international organizations: the International Union for the Conservation of Nature and Natural Resources (IUCN) beginning in 1952, International Council for Bird Preservation in 1960, and the International Congress of Game Biologists in 1959. A committee on African Wildlife was briefly in place between 1960 and 1965, and the first International Relations Committee was formed in 1963 and subsequently became the International Affairs Committee. The charges of the International Affairs Committee included building relationships and cooperating with other TWS Committees, international organizations, Federal and United Nations agencies, and private foundations, and expanding international membership. Between 1960 and 2000, increased global awareness of biodiversity conservation and concern over biodiversity loss emphasized the need for more international perspectives within TWS.

The Canadian Section was founded in 2007 and has been very active in TWS ever since. We are now close to having a Mexico Chapter. TWS has promoted an international perspective in wildlife management practice and policy for over 20 years.



Sunrise at Palo Duro Canyon State Park. Photo courtesy Jamie Killian

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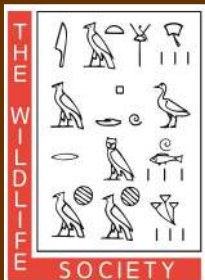
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Kathy Granillo - Southwest Section Representative To Council

If you have an interest in international engagement, please consider reading the above-mentioned report from the International Wildlife Management Working Group. It contains several detailed recommendations, based on an extensive survey they conducted in 2019 as well as a wealth of other information on international engagement.

https://wildlife.org/wp-content/uploads/2020/11/TWS_IWMWG_InternationalInvolvementReport_03072020.pdf

Another effort underway at TWS is strategic planning. Staff and Council have just kicked off development of a new strategic plan for TWS and welcomes all comments and ideas. We will reach out to all members through surveys and focal groups. I encourage you to invest some thought and effort into helping us develop this plan. I welcome any questions or comments you have, so please feel free to contact me via email at KGBirder55@gmail.com.

Lastly, TWS recently completed an overhaul and redesign of the website. If you haven't been on the website lately, I urge you to check it out at wildlife.org. It is more user-friendly than ever in terms of finding information and providing services for members. TWS appreciates any feedback you have on the website. Please let them know if you find a broken link or other problems.

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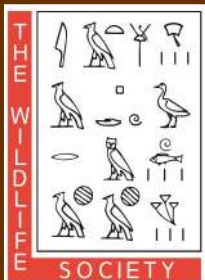
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Student News

Natalie Hamilton - SWS TWS Graduate Student Scholarship

My journey to the Southwest began at The Ohio State University (OSU), where I received my Bachelor of Science in Biology in 2015. With mentorship of then-PhD student Ben Titus, I completed an undergraduate research thesis on the phylogeography of a common aquarium animal - the "sexy shrimp" (*Thor amboinensis*). This research experience sparked my passion for using genetic data to aid in our understanding of complex ecological questions.

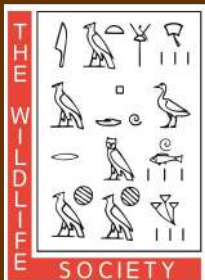
I continued on at OSU and received my Master of Science in Evolution, Ecology, and Organismal Biology in 2019 with guidance from Dr. Meg Daly. My master's research focused on an uncommon parasitic lineage of sea anemones (*Peachia*). I was able to reconstruct the evolutionary history of the genus and create a new species description for taxa within the group. After graduating with my master's degree, I began my PhD research at Texas A&M University in the Rangeland, Wildlife, and Fisheries Management Department, where I am currently in my final year. In the future, I am excited to continue research integrating genomic and ecological data to inform conservation efforts across the southwest at multiple scales.



Natalie Hamilton holding a Townsend's big-eared bat in Mendocino, California.

Photo courtesy Joseph Curti

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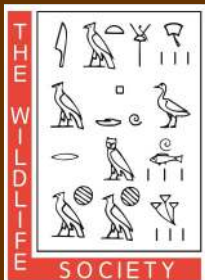
Natalie Hamilton - SWS TWS Graduate Student Scholarship

My dissertation research focuses on understanding the ecology and evolution of Townsend's big-eared bats (*Corynorhinus townsendii*). This species occurs across most of the western United States, Canada, and Mexico, with isolated populations in the eastern United States. The two eastern subspecies are federally listed endangered species and two of the western subspecies are listed as species of Special Concern or Sensitive by state and federal agencies, including the California Department of Fish and Wildlife.

During the summer, reproductively active females roost in maternity colonies (15-300 individuals), where they give birth to raise one offspring per year. In the fall, maternity colonies disperse as bats travel to hibernacula where they hibernate/enter torpor for the winter. Hibernacula are typically smaller than maternity colonies, with few to several dozen individuals. In the bats, fitness consequences of these choices, and potential vulnerability of the species to future climate change.

To address this aim, my coauthors and I first explored the environmental and climatic factors influencing the location of seasonal colonies of TBBs by building species distribution models (SDMs). Using data from 2014-2017 state-wide surveys for TBB, we built SDMs for maternity colonies and hibernacula across California. Perhaps unsurprisingly, we found that the distribution and environmental needs vary between the reproductive and non-reproductive seasons. These models indicate summer precipitation is the major factor driving the location of maternity colonies, while elevation is driving the location of hibernacula. Additionally, when these seasonal models are projected into the future (2061-2080), suitable habitat is expected to decrease for both maternity colonies and hibernacula, suggesting that the species is vulnerable to the effects of future climate change.

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Natalie Hamiton - SWS TWS Graduate Student Scholarship

After understanding more about environmental and climatic variables that influence the location of TBB roosts, we also wanted to understand why bats were choosing to roost in specific groups. Although bats predictably return to the same maternity colony and hibernacula yearly, hibernacula consist of individuals from several maternity colonies. There is evidence in mammals that group membership

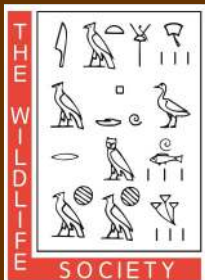


Townsend's big-eared bat (Corynorhinus townsendii) in Humbolt, California. Photo courtesy Natalie Hamilton

can be explained by kinship – where long-term associations are correlated with genetic relatedness. We use genetic and mark-recapture data to understand if TBB chooses seasonal roosts based on kinship, or if roosts are formed based on other factors like physiological needs or resource limitations.

The data for this study is from a long-term study of TBBs in the Inyo and White Mountains in eastern California. Starting in 2013, individual bats from roosts in this area were captured, PIT-tags were inserted under the skin, and a 3mm tissue biopsy was taken from the wing and tail membranes for genetic analyses. PIT-tagging bats allows for identification of previously captured individuals and estimate survivorship and seasonal movement patterns based on recapture data.

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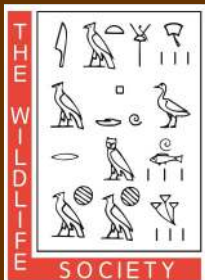
Student News

Natalie Hamiton - SWS TWS Graduate Student Scholarship

From this study, we have genotyped microsatellite loci for ~850 individuals and have obtained mark-recapture data for >3000 individuals in 36 roosts across the study area. Preliminary research of the maternity roosts indicates there is gene flow between colonies. Thus, we expect overall colony relatedness to be low, but for colonies to contain several matriline (e.g., grandmother, mother, or daughter) if family groups travel together between maternity colonies and hibernacula.

The broad results of this project will give information on population dynamics and genetic connectivity in TBB in California. Information on the grouping and movement of this widespread species will advance knowledge on how species may respond to a changing climate and how disease and pathogens could be spread through the environment. This is especially important in bats considering the risk of mass fatalities in animals that form large social groups. Further, knowing the spatial dynamics and genetic diversity of populations will aid in identifying resources (e.g., roosts) key for the persistence of the species. Identifying key resources will provide guidance to state and federal agencies for how they select and implement management actions that could potentially enhance the survival of potential refugia (areas predicted to remain suitable in the future) and at-risk populations.

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Student News

Matt Hewitt, Nicole Dickan, and Amanda Veals Dutt - Phd candidate Multi-Year Black Bear Project in West Texas

Once abundant in the mountains of West Texas, black bears (*Ursus americanus*) were extirpated by the 1950's. Overhunting, intensive predator control efforts, and habitat loss pushed the population out of the desert sky islands until they could no longer be found in the region. However, the species held their ground in the mountains of northern Mexico, where over time and with a ban on bear hunting in Mexico, they were able to repopulate and expand. The first documented recolonizing black bear was seen in the Chisos Mountains of Big Bend National Park (BBNP) in West Texas in the late 1980's. Texas declared the species endangered in the state in 1987 and bear detections steadily increased over time. National Park sightings data from the 1990's showed bears to be abundant and recorded multiple sightings of sows with cubs. This trend continues today. In 2022, BBNP made the decision to close access to parts of the Chisos basin, a geographical area within the Chisos mountains, because bear sightings and interactions with people had become so abundant. Residents in private lands surrounding the national park reported seeing bears much more frequently in the last 2 years,

indicating that bears are beginning to explore the surrounding desert lowlands.

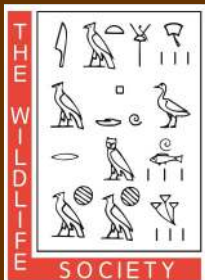


Matt Hewitt, Phd student conducting radio telemetry on radio collared black bears. Photo courtesy Amanda Veals Dutt

Very little research has been done on this metapopulation over the last few decades, despite black bears continuing to expand into new areas. In the early 2000s, research was conducted in West Texas on black bear population

dynamics, winter ecology, habitat use, and genetics. However, this research was restricted to BBNP and other public lands and was further limited by the technology of radio collars available at the time.

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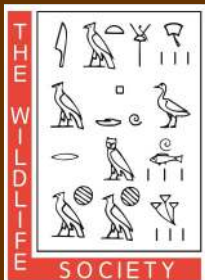
Matt Hewitt, Nicole Dickan, and Amanda Veals Dutt - Phd candidate Multi-Year Black Bear Project in West Texas

There is a strong need for an updated understanding of bears in this region as they continue to recolonize farther into the state. This provides a unique opportunity to study a newly, naturally recolonizing population of a state-listed species, of which there is no current population estimate or general understanding of their movement/range expansion.

This influx of new bears to their historic range poses a variety of questions from a management perspective. How big is this population? How are the bears using the landscape/selecting for habitat? What are they eating? How much does their winter ecology differ from other populations in such an arid environment? Is there any disease transmission risk with a relatively new species? And perhaps biggest of all, what does this influx of bears mean for the local communities?

Starting in the summer of 2022, Borderlands Research Institute (BRI) at Sul Ross State University (SRSU) in Alpine, TX set out to answer some of these pressing questions by beginning a multi-year research project with the overarching goal of seeking to understand and support the recolonization of black bears in West Texas. Researchers Dr. Louis Harveson, Dr. Amanda Veals Dutt, PhD student Matt Hewitt, and master's student Nicole Dickan started trapping and collaring bears on private and public lands surrounding BBNP. During October and November of 2022, the researchers were able to trap, sample, and collar 10 bears in the area. One of which was a collaboration with Texas Parks and Wildlife (TPWD) to trap and transport a bear that had been getting into a local restaurant's dumpsters to the nearby Black Gap Wildlife Management Area. After much consideration, TPWD moved this bear with the intention of giving the residents of the area more time to acquire bear-proof dumpsters and make other necessary changes.

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Matt Hewitt, Nicole Dickan, and Amanda Veals Dutt - Phd candidate Multi-Year Black Bear Project in West Texas

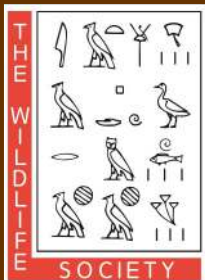
Even though this project is in its infancy, we are impressed by some of the dramatic movements the bears have made in the few months the collars have been on. Our GPS data shows straight line distance movements of just under 80 linear miles in 20 days, and over 120 linear miles in a month!

All of this goes to say that bears are naturally recolonizing West Texas. With this recolonization, local communities face the challenge of adapting their lifestyles to coexisting with bears for the first time in nearly 70 years. Because of this, human-bear conflicts are on the rise as bears are drawn to investigate the easily available food sources in human areas. There will undoubtedly be growing pains for TPWD and local communities as they make the shift towards more bear-wise practices. BRI is dedicated to gathering and providing the information necessary to facilitate these changes and allow for science-based management decisions that will foster coexistence.



Nicole Dickan, MS student with a recently captured young male black bear. Photo courtesy Matt Hewitt

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Student News

Heather Zimba - Master Student at New Mexico State University

When asked to list charismatic animals of the Chihuahuan desert in the Southwest, you might not think of the tortoise pictured in this article, but over the next couple of decades, that might change here in New Mexico.

The Bolson tortoise (*Gopherus flavomarginatus*) is the largest and rarest tortoise in North America. On average, adults can weigh more than 13 kilograms and live 70 years or more in the wild.

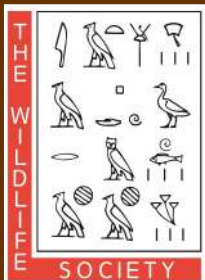
During the late Pleistocene (10,000-13,000 years ago), this tortoise's range is thought to have extended throughout the Chihuahuan desert and beyond into parts of present-day Texas, Arizona, New Mexico, Oklahoma, and Mexico. Today, however, the only extant wild population resides within a 50,000 km² area of the Bolsón de Mapimí reserve in northeastern Durango and adjacent parts of Coahuila and Chihuahua, Mexico. Due to its population decline the Bolson tortoise was listed as an endangered species in 1978. Currently, the remaining wild population of approximately 2,500 tortoises on the Mapimí reserve faces several threats, including changing climatic conditions in parts of its range, poaching, habitat modifications, and overgrazing by cattle.

In the United States, a small collection of privately-owned Bolson tortoises was donated to the Turner Endangered Species Fund (TESF) in 2006. Shortly thereafter, TESF initiated the Bolson Tortoise Recovery Project centered on the Armendaris and Ladder Ranches in southern New Mexico, which are located at the northern edge of the Chihuahuan Desert ecoregion.



Juvenile Bolson tortoise in burrow with VHF transmitter. Photo courtesy Heather Zimba

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Heather Zimba - Master Student New Mexico State University

This is the only large-scale *ex situ* breeding program aimed at conserving the Bolson tortoise and establishing populations in the United States. TEF's goal is to work with state and federal agencies to one day reintroduce the Bolson tortoise to parts of its prehistoric range in the Chihuahuan Desert.

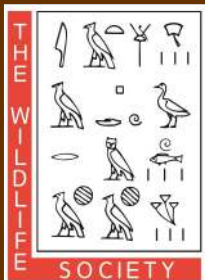
As of 2022, the Bolson Tortoise Recovery Program has produced over 800 juvenile tortoises ranging in age from less than one to sixteen years. In addition to studying captive Bolson tortoises, in 2021, TEF collaborated with the United States Fish and Wildlife Service (USFWS) and New Mexico State University (NMSU) to begin translocating captive-reared juvenile Bolson tortoises to a section of the Armendaris Ranch. Project staff have released 101 tortoises on the site across four release cohorts to date. These translocated Bolson tortoises have been monitored regularly since their release to evaluate post-release movement patterns and behavior.



A juvenile Bolson tortoise emerging from a burrow on the Armendaris Ranch in New Mexico. Photo courtesy Heather Zimba

As a graduate research assistant at NMSU, the goal of my master's research is to understand the reintroduction potential of the Bolson tortoise by examining release effects, habitat selection and space use of translocated Bolson tortoises. I will evaluate the effects of release season (Fall vs. Spring) on habitat selection, movement rates, and home range, and how they may vary longitudinally with respect to time since release. This information is vital for planning future releases in the Chihuahuan desert to re-establish tortoise populations.

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Heather Zimba - Master Student New Mexico State University

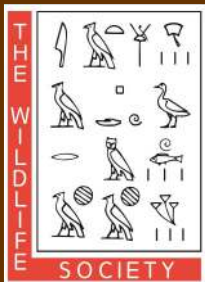
Preliminary research conducted on the translocated tortoises in 2022 indicates that tortoises often create or modify existing burrows under vegetation or use vegetation as cover at the release site. What is more, tortoises were documented creating burrows or taking shelter under 12 different plant species. While monitoring the released population, we have noticed some interesting behavioral patterns. Figure 3 shows two juvenile Bolson tortoises sharing a burrow. This pair of juvenile tortoises shared a burrow for over a month during the 2022 active season. This behavior of sharing burrows and visiting other tortoise burrows is fascinating to witness and indicates this tortoise species may be more social in nature than other southwestern desert tortoises.

There is much more to learn about the Bolson tortoise, but based on captive breeding and translocation projects, this species seems well-equipped for reintroduction to its former range in the northern extent of the Chihuahuan desert in New Mexico. Someday soon, we hope more people will think of this tortoise as the "Chihuahuan desert tortoise."



Two juvenile Bolson tortoises sharing a burrow at their translocation site. Photo courtesy Heather Zimba

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State News

**Karen H. Gaines Share with Wildlife Coordinator,
New Mexico Department of Game and Fish**

Project proposals sought for Share with Wildlife funding

As of March 31, 2023, the New Mexico Department of Game and Fish's (Department's) Share with Wildlife program will begin accepting proposals for projects with a planned start date on or after January 16, 2024. All project proposals are due by **5:00 p.m. Mountain Daylight Time on Friday, June 16, 2023.**

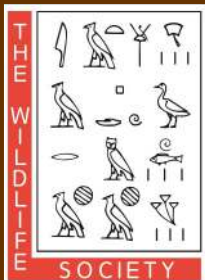
The Department's Share with Wildlife program began in the early 1980s and welcomes proposals for wildlife-focused projects taking place in New Mexico in four categories: habitat enhancement, biological and ecological research, wildlife rehabilitation, and wildlife education. The program receives an average of 30-35 proposals annually and has consistently funded approximately 10-12 projects each year.

Project topics of particular interest to the Department and details about the required format for proposals are listed in the Call For Project Information (CFPI) for Fiscal Year 2024 (FY24), available at <http://www.wildlife.state.nm.us/conservation/share-with-wildlife/>.



Educators learning how to use materials for the "Changing River Model" habitat activity in the Bosque Education Guide. Whitfield Wildlife Conservation Area, New Mexico. Photo courtesy Karen H. Gaines

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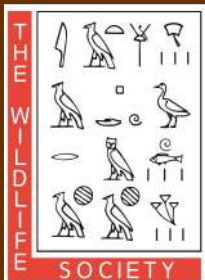
Karen H. Gaines Share with Wildlife Coordinator, New Mexico Department of Game and Fish

Projects that address the CFPI's topics of interest include data compilation, field surveys, or other actions that will inform habitat restoration on Department properties or provide needed information for the next revision of the State Wildlife Action Plan for New Mexico. Research projects that focus on issues of interest for Species of Greatest Conservation Need (SGCN) as specified in the CFPI are also encouraged. SGCN of interest for FY24 include the peppered chub, gray-checkered whiptail, and Pacific marten.

Permitted wildlife rehabilitators and environmental educators who want to design and/or implement curricula focused on SGCN, their habitats, climate change adaptation, and other science-driven topics may also submit proposals. The total budget for any project cannot exceed \$50,000. Collaboration with tribal entities for any project type is encouraged.

Please note that **ALL** individuals who plan to submit a research or habitat project proposal must discuss their proposed project topic with the Share with Wildlife Coordinator (Coordinator), Karen H. Gaines (karenh.gaines@dgf.nm.gov; 505-795-2319), as soon as possible but no later than **Friday, May 19, 2023**. Individuals submitting proposals for education or rehabilitation projects are encouraged, but not required, to contact the Coordinator to discuss their proposed project topic by the May 19 deadline. All applicants must follow all instructions provided in the CFPI and use the appropriate Share with Wildlife Proposal Cover Sheet for their project type (habitat, research, rehabilitation, or education) provided on the above website.

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Karen H. Gaines Share with Wildlife Coordinator, New Mexico Department of Game and Fish

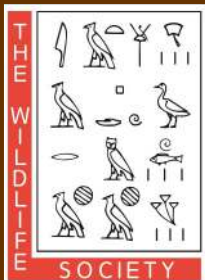
The Coordinator is looking forward to seeing the innovative and exciting proposals that will be submitted this year by the many researchers, educators, and wildlife rehabilitators who are deeply invested in learning about, sharing their knowledge of, and caring for the amazing diversity of wildlife in New Mexico. The Share with Wildlife program receives terrific proposals every year from interested parties across New Mexico and from other states, and this year's proposals are anticipated to be just as compelling.

All questions about the application process should be directed to the Coordinator at karenh.gaines@dgf.nm.gov or 505-795-2319. All proposals must be submitted electronically, preferably in a single .pdf file (no .zip files accepted), to karenh.gaines@dgf.nm.gov no later than **5:00 p.m. (Mountain Daylight Time) on Friday, June 16, 2023.**



*Male and female Sacramento Mountain salamanders (Aneides hardii). Lincoln National Forest, New Mexico.
Photo courtesy Ginny Seamster*

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Dr. Sara Weaver, CWB —Principal—Natural Resources Director Bowman

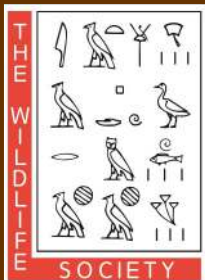
Certain bat species are susceptible to wind turbine fatality. The hoary bat, eastern red bat, silver-haired bat, and Brazilian free-tailed bat comprise the majority of fatalities at wind turbines in the U.S. These data come from post-construction monitoring efforts conducted beneath wind turbines at operational facilities. Such studies have occurred for more than twenty years, with field methods varying from site to site and the estimators to calculate bat mortality rates evolving over time. However, the general picture has stayed the same. Certain bat species, like the hoary bat, could be facing population-level declines due to wind turbine impacts.

At the 14th Wind Wildlife Research Meeting (WWRM) held in Kansas City, Missouri, in November 2022, a workshop was held to discuss the past and future role of post-construction monitoring. A focus of this was to answer what, if any, changes should be made to how and when we do such studies. Post-construction monitoring is expensive and if it doesn't inform management decisions, then is there enough value given the costs? In many situations, post-construction monitoring is only conducted for due diligence, and in others it is a requirement of an incidental take permit (ITP) issued for an endangered species, like the Indiana bat. In some regions we have more than a decade of data and continue to see similar trends, and yet if a new facility is built often a new round of post-construction monitoring is performed.



A Brazilian free-tailed bat carcass waiting to be worked up in the foreground, while a wind energy technician is working up a bat carcass in the background in southern Texas. Photo courtesy Sara Weaver

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Some have said we are only monitoring for monitoring's sake when it is for due diligence, which can be viewed as a waste of resources. This has led the industry, as well as the scientific and conservation community to question if we should continue to monitor at every location, or is taking a larger-scale approach a better use of the resources invested? This was a topic at the WWRM workshop, and not one so easily answered.

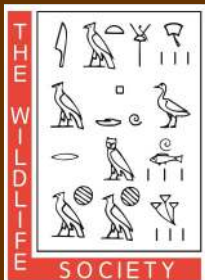
During the breakout session, attendees discussed various topics including switching to a regional monitoring program instead of site level, but another questioned emerged. Can money allocated for site-specific monitoring be better spent on minimization strategies, such as curtailment? Curtailment occurs when wind turbine operations are shuttered during periods of peak fatality, often during low wind speeds in the later summer and fall. This strategy is effective for reducing bat fatalities, but it causes a loss in energy production and can be too costly for facilities to be commercially viable depending upon the wind profile at a particular site. In places where there aren't threatened and endangered species concerns, curtailment typically not required, and thus many facilities do not implement it. For species like the hoary bat, waiting until becomes listed to implement reduction strategies should not be the answer.



The carcass of a Brazilian free-tailed bat killed at a wind energy facility in southern Texas.

Photo courtesy Sara Weaver

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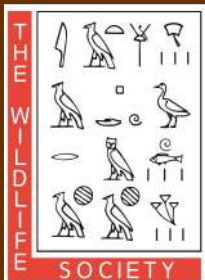
Dr. Sara Weaver, CWB —Principal—Natural Resources Director Bowman

During a symposium on land-based renewable energy and wild-life conservation at the TWS annual meeting in Spokane, Washington this past year, Dr. Erin Baerwald and others suggested money used towards monitoring could be better spent offsetting costs of curtailment at wind energy sites. While at first this concept seems practical, after audience discussion in which industry stakeholders were present it became clear that the intricacies of setting up, managing, and implementing such a program are vast. However, I believe it is worth exploring and hope the stakeholders involved in these two meetings accept the challenge! My desire is the conversation around changes to monitoring and the best use of resources continues to progress with tangible solutions for bat populations.



Spear globemallow (Sphaeralcea hastulata) in southern Texas. Photo courtesy Onalise Hill

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Bryan Bird—Director of Southwest Program Defenders of Wildlife

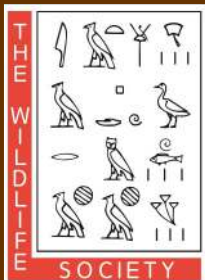
A 2022 [study](#) by Defenders of Wildlife, "Spatiotemporal patterns in golden-cheeked warbler (GCWA) breeding habitat quantity and suitability," published in the scientific journal *Avian Conservation and Ecology*, highlights more than three decades of suitable habitat decline for the Golden-Cheeked Warbler (*Setophaga chrysoparia*).

The golden-cheeked warbler, a Neotropical migratory songbird, is listed as endangered under the U.S. Endangered Species Act, and breeds exclusively in central Texas where human population growth and urban sprawl are projected to continue at one of the highest rates in the country. The species relies on mixed ashe juniper (*Juniperus ashei*) and oak (*Quercus*) woodlands for nest-building and shelter during the spring and early summer months. Defenders of Wildlife's researchers used land-cover and disturbance data spanning 33 years (1985 to 2018) to conduct a geospatial analysis to quantify changes and identify shifts in breeding-habitat quantity and suitability for the golden-cheeked warbler.

Land cover conversion is one of the major threats to our threatened and endangered species in the U.S., continuing at a rate of two football fields per minute. Defenders of Wildlife's study examines land-use changes in golden-cheeked warbler breeding-habitat quantity and suitability over space and time. Conversion of lands historically to agricultural and now rapid urban growth is contributing to large declines in suitable habitat and increased forest fragmentation, which may pose a threat to species recovery.

Since 1985, 13% of all forests within the Warbler's breeding range have been disturbed, with greater incidences near the metropolitan areas of San Antonio (32%) and Austin (24%). Additionally, there was a 42% decrease in suitable habitat (i.e., intact forests primarily composed of ashe juniper and oak stands) and a decrease in mean patch size. The study also found that declines in suitable habitat were smaller in protected areas, but there are few protected areas in Texas. Protected areas make up less than 2% of the state and protect only 10% of the suitable habitat in the breeding range.

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Bryan Bird—Director of Southwest Program Defenders of Wildlife

The findings demonstrate a need to strengthen current conservation measures and identify priority lands for conservation protections within golden-cheeked warbler habitat. This will help ensure the availability of more suitable habitat, which should aid in species recovery. Newer proposals, such as the Biden Administration's America the Beautiful Initiative, which aims to protect at least 30% of U.S. lands and waters by 2030, may provide additional opportunities for land designations and conservation efforts for imperiled species like the golden-cheeked warbler.

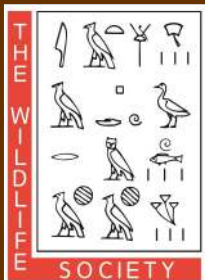
The study also recommends that future golden-cheeked warbler habitat conservation efforts prioritize supporting current protected areas and expanding protections in the Balcones Canyonlands and Fort Hood areas and regions west of San Antonio and Fort Worth to aid the species' recovery. Travis County and the U.S. Fish and Wildlife Service are currently implementing plans to increase areas protected for endangered species including the Balcones Canyonlands Preserve and Balcones Canyonlands National Wildlife Refuge, respectively.

Texas Hill Country is projected to remain a stronghold for Ashe juniper trees in which golden-cheeked warblers nest, which would indicate that conservation investment in this area could have longer-term benefits for the species. Researchers and managers can use these results to prioritize conservation action and inform upcoming species status determinations.



Golden-cheeked Warbler opening mouth to sing. Photo courtesy Isaac Sanchez

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Kerry Baldwin, CWB

What do a group of retired wildlifers do in their golden years, one thing is to look around for a project to keep their hands and minds in the game and get out in the field. In the case of the Bobcats in Tucson (BIT) crew, which means bringing over 200 years of wildlife experience to an intensive 4-year volunteer effort looking at bobcats in the urban/wildland interface in Tucson, AZ.

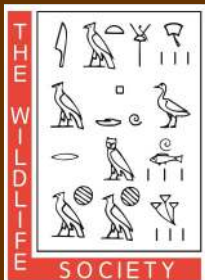
The study is intended to do an initial investigation of habitat selection and use by bobcats living at the urban/wildlands interface, and determine seasonal survival, mortality causes, and home range sizes. Additionally, we hope to identify natal dens, kitten rearing habitat characteristics, and female behaviors when raising kittens in the various levels of urban development. A last objective is to increase Community awareness and support for bobcat conservation through project outreach efforts.

Working under the administrative umbrella of the Southwest Wildlife Conservation Center (SWCC), the project received an Arizona Game and Fish Heritage Urban Wildlife Fund grant in July of 2020; Lottery Dollars Working for Wildlife. The initial \$33,000 was used to acquire capture gear, satellite collars and telemetry gear, and cover Veterinarian supplies. The project has since raised over \$85,000 in external donations. Over 21,000 visits have been made to



Cheryl Mollohan holding BC #4 aka "Dave" adult male with a 14 square mile ome range extending from wildland conservation areas, through golf courses all the way into a densely developed barrio near downtown Tuscon. Photo courtesy Bobcats in Tucson

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Kerry Baldwin, CWB

the project website, **bobcatsintucson.net**, and over 1,200 locals have taken a short survey on Attitudes and Values of Living with urban bobcats.

The project formally got underway with the first bobcat captured on 11/17/2020. BC# 1- Shannan, was fitted with a Telonics collar and we tracked her for the next 18 months. Since that start, the project has captured 53 different bobcats in 65 successful captures, collared 35 bobcats and currently have collars out on 15 females and 5 males. Additional capture efforts will be conducted into the fall of 2023. To date, we have over 35,000 GPS locations from the 35 collared bobcats.

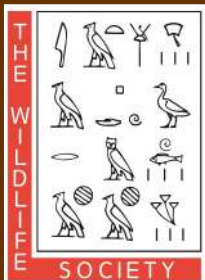
The urban bobcats have opened a window into their world and habitat choices in ways not always expected. While all the data is preliminary, we are seeing some interesting trends. Some preliminary notes worth sharing:

- Building densities in the primary study area range from 0/sq. kilometer to over 1000/sq. kilometers. Bobcats use all the densities.



Female with kitten. Photo courtesy Bobcats in Tucson

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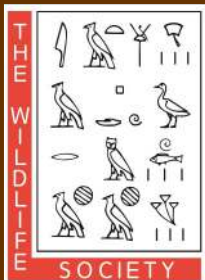
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Kerry Baldwin, CWB

- Females that have the choice of undeveloped wildland in home ranges tend to use rough, inaccessible mountain top areas to have kittens in, then bring them back down to mixed urban development as they get older.
- Females that do not have access to wildlands use urban structures like natural features to have and raise kittens.
- Female home ranges are running between 3-5 sq. miles. The smallest has been just 1.3 sq miles, all on a golf course complex. There is very little overlap of female home ranges. We do have several young female home ranges totally inside another female's range that we think are mother/daughter. Males are running 4 to 15 sq. miles with lots of overlap. Both males and females seem to make a circuit around their urbanized home range every 5-10 days.
- One female was tracked keeping her kittens on adjacent roofs of occupied homes in a dense housing development for over 6 weeks.
- We have followed a situation where two female bobcats have appeared each of last 7 years with small kittens about same time and share nursing and rearing activities for the two litters.
- Primary mortality factors have been human caused deaths around urban chicken conflicts, fear killings and deadly vehicle strike incidents.
- To date, over 1,200 recent bobcat sightings by citizen scientists have been reported for the Tucson Metro area.

Tucson has plenty of bobcat habitats and a productive, dense population. There is strong community support for urban bobcats and a general tolerance of coexisting with these fierce little predators in close contact by most residents. Having bobcats around has become a point of pride. By the end of our project, we feel we will have a much better and fresh understanding of how urban and semi-urban bobcats utilize different habitats in the Tucson area to go about making a living.

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& **Anna Lad** annablairelad@gmail.com 254-702-1869

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Is now under TWS' Ethnic and Gender Diversity Working Group (EGDWG)

Don Yasuda Chair dyasudaTWS@gmail.com

Women of Wildlife Committee & EGDWG Liason

Kathy Granillo kbirder55@gmail.com 505-864-4021



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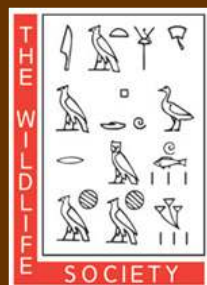
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