

THE ARIZONA WILDLIFER

2024 Issue I

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Winter Edition

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EXECUTIVE BOARD

President: Sarah Rinkevich
(520) 203-1448 sarah_rinkevich@fws.gov

President-Elect: Chris Carrillo
(480) 292-1830 chris.d.carrillo@usda.gov

Treasurer: Haley Nelson
(480) 204-9312 haleynelson92@gmail.com

Recording Secretary: Tiffany Sprague
(623) 670-0750 tasprague@gmail.com

Corresponding Secretary: Lola Van Pelt
(480) 213-5312 lolita.i.vanpelt@usda.gov

Board Member: Jesse Lewis
(480) 727-1101 jesse.s.lewis@asu.edu

Board Member: Lias Hastings
(928) 225-0316 lias.hastings@usda.gov

Newsletter Editor: Tiffany Sprague
aztwseditor@gmail.com

Contact us:
<https://aztws.com/about/contact-us>
PO Box 87015, Phoenix, AZ 85080



The President's Message



Sarah Rinkevich, 2023 AZTWS President (left), with life-long friend Daria Sparling (right) at her ranch in Mammoth, Arizona.

Greetings and welcome to the Winter AZTWS newsletter. In thinking about winter in Arizona, and the snow in high elevation areas, I am reminded that the word for snow in Apache is *zas* [pronounced *zus*]. I say this because I am extremely excited about the 2024 plenary session during the Joint Annual Meeting between Arizona and New Mexico

chapters of The Wildlife Society and American Fisheries Society to be held in Flagstaff at the Little America Hotel, February 1–3, 2024. The theme of our plenary session is “Wildlife Stewardship on Tribal Lands.” Information about the plenary speakers may be found in the following pages within this newsletter. Tribal lands in Arizona equate to just less than 30% of the state’s land mass, so it makes sense to highlight Tribal leadership in natural resource management at the conference. Speakers will discuss Tribal wildlife and fisheries conservation and management, Indigenous Knowledge of wildlife, plants, and traditional foods, and Tribal relations. We will also have the recent book *Wildlife Stewardship on Tribal Lands: Our Place is in Our Soul*, edited by Serra J. Hoagland and Steven Albert and published by John Hopkins University Press, available for purchase by conference attendees. This conference is stacking up to be exceptional!

Regarding the picture I chose for this newsletter as my last President’s Message, I wanted to reflect on long-term relationships that I have had in my life and throughout my career. I am grateful to have chosen the field of wildlife biology because it has blessed me with friends and colleagues who share the same passion I have regarding the conservation of fish, wildlife, and plants within Arizona and elsewhere. My friends within this field are always supportive and

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Presidents Message cont...

provide me with many valuable perspectives. I think it is why I look forward to the Joint Annual Meeting in February...to be with good friends and esteemed colleagues who share the same desire I have—to keep learning from others, support students, and celebrate this magnificent field of wildlife biology. See you in February!

All the best,
Sarah



Get ready for JAM!

2024 Joint Annual Meeting
February 1–3, 2024
Little America Hotel, Flagstaff, Arizona

[Learn more and register here](#)

Join us for the 56th annual Joint Annual Meeting of the Arizona and New Mexico chapters of The Wildlife Society and American Fisheries Society! Packed with informative presentations, networking opportunities, and educational workshops, this conference is ideal for students and seasoned professionals alike.

Be sure to sign up for a [workshop](#) on Thursday, February 1, followed by chapter business meetings and the evening social. Then come cheer on students as they compete in [Quiz Bowl](#), starting at 7 p.m.

Plenary Session: *Wildlife Stewardship on Tribal Lands*
Friday, February 2, 2024
8:30–10:30 a.m.

Featured speakers:

Gloria Tom, Director of Navajo Nation's Department of Fish and Wildlife, will discuss Wildlife and Fisheries Management on the Navajo Nation.

Twila Cassadore, San Carlos Apache Tribe and advocate for Indigenous food sovereignty, will present on Indigenous food traditions throughout the Western Apache Tribes.

Dr. Serra Hoagland, Laguna Pueblo, National Program Lead Tribal Research, Forest Service, Rocky Mountain Research Station, will present "Tribal Wildlife Stewardship: a model for sustainability."

[Register and book your hotel room today.](#)

We look forward to seeing you there!

Questions? Contact Sarah Rinkevich at (520) 203-1448 or sarah_rinkevich@fws.gov



Need Money?

The Arizona Chapter of The Wildlife Society has grant opportunities to help support attendance at the upcoming Joint Annual Meeting (JAM). If you are a student, new professional, or established professional who needs some financial assistance, please check out these opportunities!



Continuing Education Grants

AZTWS offers \$1,500 annually in [Continuing Education Grants](#) to its members (including professionals, graduate and undergraduate students) to support education and career development opportunities (conferences, workshops, trainings, etc.). Grant requests should not exceed \$500 per application and only one grant is awarded per person, per year. Grants are limited to current Chapter members only; membership dues are \$6/year. Join or renew [here](#).

Applications can be submitted at any time and will be reviewed quarterly by the Continuing Education Committee. Applicants will be notified within 30 days of the Committee's review. The Committee evaluates applications based on your explanation of how the activity will enhance your career development, your financial need, your efforts to obtain supplemental funding, and your involvement in Chapter activities. AZTWS encourages applicants from under-represented individuals and groups.

APPLY NOW

Reed Sanderson Memorial Award

Help celebrate the life of Reed Sanderson (1932–2020). Reed was a husband, father, Navy veteran, wildlife biologist, member of The Wildlife Society and Fellow of The Wildlife Society. During his long career, Reed worked for the U.S. Forest Service as a Range Conservationist, Range Scientist, and Wildlife Biologist. After his retirement from the Forest Service, Reed worked for the University of Arizona as a liaison between the university and federal and state agencies working toward conservation of the Mount Graham red squirrel. In addition to his outstanding career as a wildlife biologist, Reed was known as an engaged mentor who took great pleasure visiting with students and early-career professionals at the TWS annual conference and at the local JAM.

Reed is remembered as an engaged mentor who took great pleasure visiting with students and early-career professionals at the TWS annual conference and JAM. In remembrance of Reed and his commitment to mentorship, AZTWS offers scholarships to provide financial assistance to attend the JAM.

Due date is January 7, 2024.

APPLY NOW

Regional News

Southwest Section Tracks

By **Kathy Granillo**,
TWS Southwest Section Representative



Southwest Section Representative
Kathy Granillo with a wolf pup.

As I write this column, the winter solstice approaches. For us in the northern hemisphere, the winter solstice occurs on December 21 in 2023. The winter solstice is the day with the fewest hours of sunlight throughout the year, making it the “shortest day” of the year. Although the winter solstice means the start of winter, it also means the return of more sunlight. It only gets brighter from here! When we meet in Flagstaff for the JAM in February, it will still be winter, but we will have about 10.5 hours of sunlight per day.

More sunlight usually makes me happy, but why am I writing about it in this column? Well, it links to my last article in which I wrote about animal migrations and movements. A study tracking vastly diverse species over several years has found that day length is one of the essential factors determining migration in birds. Published in the *Journal of Animal Ecology* in 2021, [the study](#) is the first to highlight that daylight availability could be an ultimate cause of the global phenomenon of bird migration that involves billions of birds annually.

This is relevant to our conservation efforts, given the rapidly changing world we live in due to accelerating climate change. The study confirmed that migration to regions with longer days is beneficial for birds with highly contrasting life histories. Long days enable higher activity levels, allowing birds to achieve this activity with lower energy expenditure rates.

“This has important implications when exploring animal decision-making,” says Ivan Pokrovsky, first author of the study. “Even in a rapidly changing world, daylength will remain stable.” The finding takes on added relevance for vulnerable ecosystems, such as the Arctic, where the role of day length is high and rapid warming is already affecting terrestrial tundra ecosystems. Many challenges remain for humans and wildlife to cope with the changing world.

In my last column, I wrote about roads and wildlife overpasses and underpasses. I closed by asking you (the reader) what else is being done in Arizona to make wildlife movements safer. We all know that millions and millions of birds migrate through Arizona and that many of them breed or winter in the state. We don’t think of roads as a cause of mortality to birds, and yet thousands of birds are killed by cars every year. How many of you have looked closely at the roadkills as you drive on any road or highway in the state? How many are birds? Do you ever get out and look at all the little animals and birds killed on our highways?

But, by far, one of the biggest killers of birds is our buildings and their windows. Check out the [Sonoran Joint Venture webpages](#) on birds and window strikes, which say the following:

While threats to migratory birds at high-rise buildings have gotten the most attention, most fatalities actually occur in low-rise buildings and residential areas. Birds often confuse reflected sky and vegetation for real habitat and fly into glass. Birds that hit windows get injured, become stunned and highly susceptible to predators, or die on impact.

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In fact, 365 million to 1 billion birds die from window collisions every year in the U.S. alone. Likewise, artificial lights and skyglow in metropolitan areas can be confusing, throwing disoriented birds off their migration paths. Exhausted birds become vulnerable to other urban threats and window strikes. Safe Light and Lights Out programs that turn off or reduce excess lighting in cities during migration months are becoming more common, but most concentrate on the eastern part of the country. Every year, the millions of birds that travel through Arizona on their migratory pathways are at risk.

Efforts to make buildings and windows safe for birds is an effort anyone can contribute to by how you manage your own lights and windows at home and by working locally to get your town or city to do the same.

Let's get back to roads—we know they are dangerous to all wildlife that live near them or that cross them. What can we do besides highway crossings to make roads safer for wildlife? One tool we have is Fauna Sensitive Road Design (FSRD). This is a tool for transport policy that acknowledges the negative impacts of roads on wildlife and seeks ways, through modifications to road design, that facilitate the safe and natural movement of wildlife across roads. We also need to consider roads and their placement within the larger landscape. Landscape metrics may assist transport planners to better visualize the environmental impacts of the transport network, develop priorities that inform road function and design, and inform conservation measures that facilitate wildlife movement. The bigger question is how to get transport planners to think about wildlife, wildlife movement, and habitat fragmentation. One way is through specific funding aimed at this topic. I urge you to support passage of a federal highway bill with new innovative provisions to address wildlife corridor/transportation conflicts, as well as encouraging a landscape-level approach to transportation planning in general.

Speaking of planning, TWS is deep into crafting our next Strategic Plan. Everyone on Council along with many TWS members from across the continent are assisting. We have three main goals that we are currently fleshing out with objectives and strategies. These goals are building community, supporting professionals, and exercising external influences.

Thanks for all that you do for wildlife and wild places. I hope to see many of you at the JAM in Flagstaff in February.

As always, please feel free to contact me with any concerns or comments or questions about what I've written, about TWS, and about TWS Council.

Sincerely,
Kathy
KGBirder55@gmail.com



THE WILDLIFE SOCIETY
Leaders in Wildlife Science, Management and Conservation

Our Neck of the Woods...

Some Like It Hot: Thermal Ecology in a Desert Riparian Zone

By Brian Blais, University of Arizona

Have you ever wondered about how ectothermic (“cold-blooded”) animals deal with keeping warm or staying cool, especially as the climate changes? And how much can they tolerate when it gets too warm or too cold?

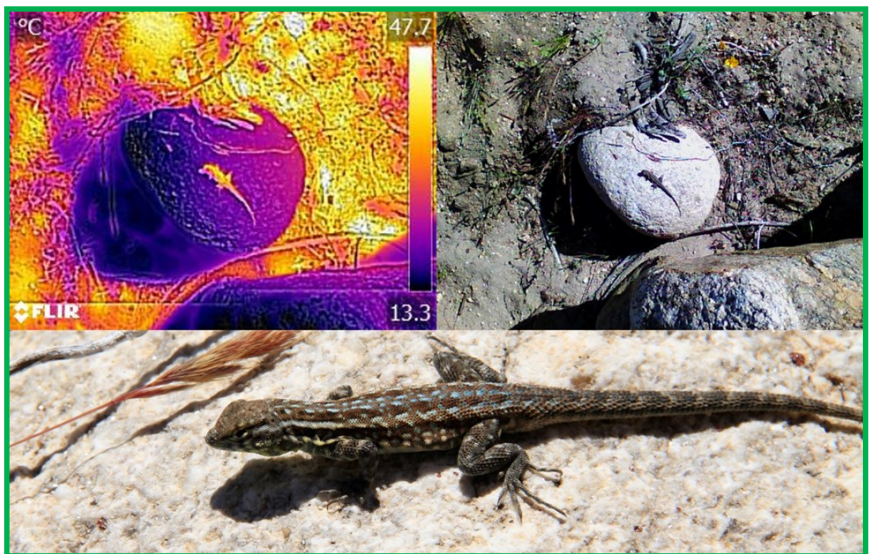
Species-environmental relationships, including the factors that influence body temperature of animals, are important for understanding the physiological needs of species. Ectothermic amphibians and reptiles (“herpetofauna”), for example, require external conditions from the environment (e.g., warmth directly from the sun or from warmed surfaces), behavioral choices, and other physiological conditions to thermoregulate their body

temperature. For these animals, there is a happy medium in body temperature for optimal function for their life activities. Getting too hot or too cold, however, reduces their capacity for activities and can have catastrophic consequences. Hence, it is important to understand how ectotherm body temperature relates to environmental heat (i.e., thermal ecology) in the light of climate change.

So we just take the temperature of these animals right? A thermometer provides only a single reading, whether it be for animal or environmental temperature. Environmentally, thermometers capture only a relative approximation in what is actually a complex composite of varying temperature zones dispersed across a landscape—a heterogenous thermal mosaic—that can differ between upland and lowland, near and far from water, and even from the top to the bottom of a boulder. We just cannot see it, although we sometimes feel it. Ectothermic animals certainly feel it!

Fortunately, technological advances have provided tools to “see” those thermal mosaics in the field. Infrared thermography (IRT) includes the use of thermal cameras—with sensors set to infrared

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Infrared thermographic image from a thermal camera (top left) capturing the heat of a side-blotched lizard (*Uta stansburiana*) and its surrounding rock perch; bar indicates thermal range in Celsius. Credit: Brian Blais

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wavelengths—to pick up on the subtleties of heat dispersion. Think those *Predator* movies and the deepening levels of “red” that the titular character sees, which indicates a heat source, (e.g., Arnold Schwarzenegger). Thermal cameras detect the heterogenous heat zones across their focal frames, including microhabitats and animals alike. And IRT omits the need to capture an animal and physically take its temperature, which can be stressful; many studies have shown that IRT reliably infers an animal’s internal body temperature.

In Arizona’s desert climates, riparian zones—habitats adjacent to waterways—are synonymous with biodiversity and are vital for numerous plant and animal species. Riparian habitats along Sabino Creek in Tucson’s Sabino Canyon Recreation Area, for example, support nearly 50 species of amphibians and reptiles. In recent years, this important area has been subjected to long-term drought, several climatic extremes (e.g., wildfire, high-flow flooding), and high water demands in the region.



Sabino Creek in Sabino Canyon Recreation Area supports robust riparian zone habitat. Credit: Brian Blais

For herpetofauna in the lower reaches of Sabino Creek and its adjacent riparian zone, I was interested in using IRT to (a) explore

the environmental and thermal variation among microhabitats used and available to herpetofauna; (b) evaluate the relationships of body temperature with the surface temperature of used microhabitats (i.e., perch sites); and (c) model multiple factors that may be influencing herpetofauna body



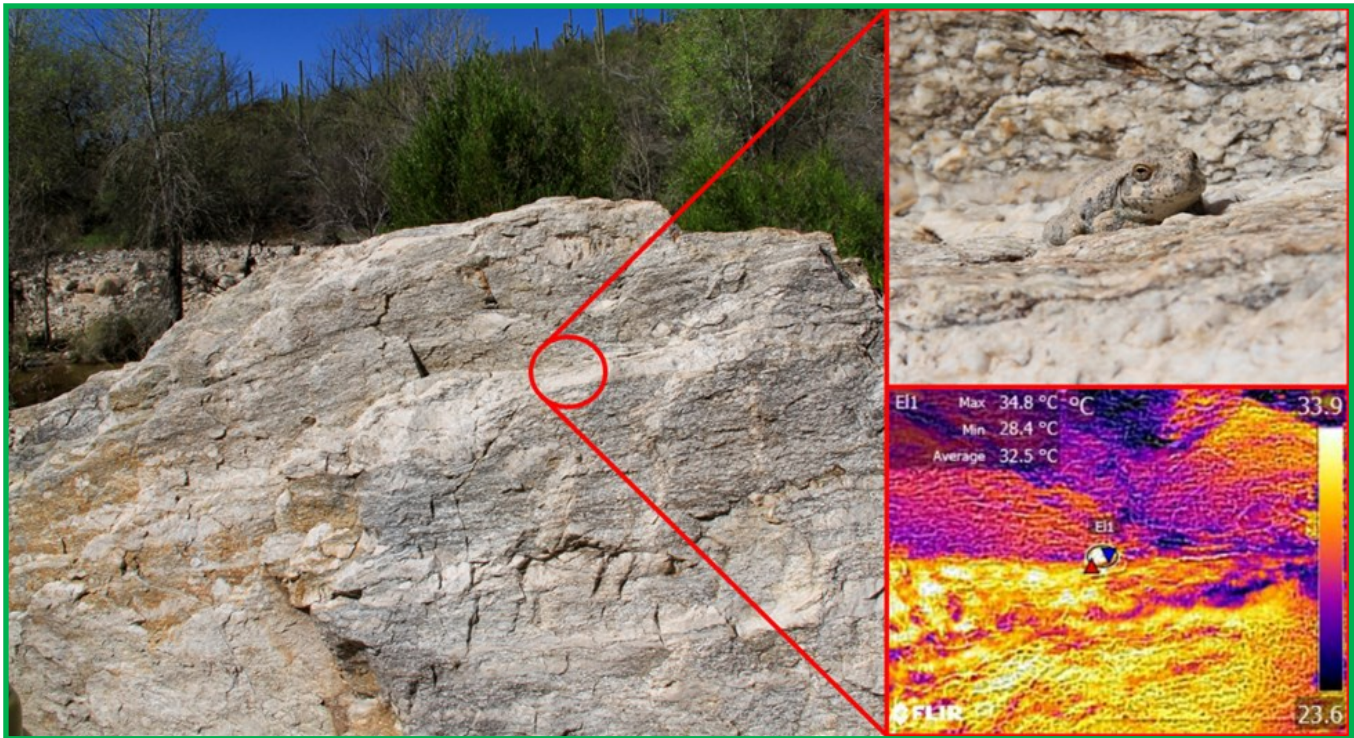
Sonoran spotted whiptail (*Aspidoscelis sonorae*) actively moving through riparian habitat in Sabino Canyon, Tucson. Credit: A. Low

temperature. Gaining a better understanding of ectotherm-environmental relationships and monitoring their responses across time can help guide more effective biodiversity conservation management strategies as the climate warms and dries. This project also provided an opportunity to mentor several undergraduate technicians, including those getting field experience for the first time.

During spring mornings in 2020 and 2022, we amassed thermal ecology data on 81 reptiles and amphibians. Our most common species were canyon treefrogs (*Hyla arenicolor*), ornate tree lizards (*Urosaurus ornatus*), and side-blotched lizards (*Uta stansburiana*). When we detected an animal, we slowly approached and snapped images with a thermal camera—with animal and

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Canyon treefrog (*Hyla arenicolor*) perched on large boulder in direct sunlight during a spring morning in the Sabino Creek riparian zone. Bottom right: This frog's body temperature registered at $>90^{\circ}\text{F}$! Credit: Brian Blais

microhabitat perch in view. Resolution of each IRT image contained 76,800 pixels, each representing a precise, sensitive temperature reading! We also evaluated the environment at the capture site, including microhabitat type (e.g., rock, plant, debris, etc.), ambient conditions (e.g., air temperature, humidity), and surrounding composition. For each spot where an animal *was*, we repeated assessment at a nearby spot where an animal *wasn't*—this tells us something about differences between sites used versus those available.

Our statistical models found that herpetofauna were more likely to use shadier sites as the temperature warmed. This is important as the various types of microhabitats available exhibited much thermal variability. Body temperature of herpetofauna also varied, with reptiles (mostly lizards) being warmer than amphibians (mostly canyon treefrogs). After modeling microhabitat composition and environmental parameters, we found that microhabitat surface perch temperature best explained herpetofauna body temperature. Reptiles had more variance (i.e., greater differences) from surface temperatures than amphibians—although all herpetofauna body temperature approached then exceeded equilibrium with surface temperature as mornings warmed. That is, as the environment warmed, so did the herpetofauna, where the latter eventually warmed beyond the former. Interestingly, we found that certain ambient parameters such as air temperature, barometric pressure, and relative humidity—historically common data collected in herpetofauna environmental studies—were insufficient at explaining body temperature in this desert riparian system. Also interesting were the equilibrium temperature between body and perch site for side-blotched lizards. They were as warm during springtime mid-mornings in Sabino Canyon as they were during summertime in an aridland Utah population (per another study). Even in the spring, it got quite hot in Sabino Canyon!

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So what is the big picture from this study? Body temperature of herpetofauna was strongly influenced by microhabitat perch surface temperature. Although the riparian zone provides a variety of microhabitats, including shaded spots, both reptiles and amphibians were as warm by spring mid mornings as in the early afternoons. What happens if those optimal temperatures are reached earlier and earlier in a day? Will herpetofauna have enough time to do their things before it simply gets too hot? Canyon treefrogs were closely tied to surface temperature—we observed some individuals perched on rocks in direct sunlight and with body temperature as hot as 93°F! This supports prior science that canyon treefrogs exhibit impressive tolerance against water loss...but it also brings about new questions about how much increasing heat these amphibians can handle as the climate warms and dries.

Other studies—including those by former AZTWS Treasurer Kerry Griffis-Kyle—have found many desert herpetofauna species to be vulnerable under climate change, especially amphibians. Monitoring responses by herpetofauna to climate shifts is important to better understand thermal tolerances and better inform wildlife management strategies in desert riparian systems like Sabino Canyon. Increasing technological advances and affordability make IRT a useful tool to monitor and assess ectothermic animals and their microhabitats across time in changing systems. If nothing else, we get glimpses into the more complex than realized thermal ecology of species.

If you're interested in reading our scientific publication about this project, [you can freely access it here](#).

SHARE YOUR AZ WILDLIFE STORIES

Want to share your Arizona wildlife stories and perspectives? Please consider submitting **articles, stories, project updates, events, and pictures** for upcoming newsletters!
AZTWS welcomes all contributors.

The Arizona Wildlifer Deadlines

<u>Issue</u>	<u>Deadline</u>
Spring 2024	Mar 15, 2024
Summer 2024	Jun 14, 2024

Email submissions at any time to aztwseditor@gmail.com.

Inspirational Leadership: Carol Chambers Bestowed with the Aldo Leopold Award

By Kay Nicholson, President of the Southwest Section of The Wildlife Society



Carol Chambers accepted the prestigious Aldo Leopold Award during the 2023 TWS annual conference. Credit: David Frey, TWS

In a heartening recognition of dedication and passion, Carol Chambers was honored with the prestigious Aldo Leopold Award for her exceptional work in wildlife conservation and her significant contributions to supporting wildlife scientists. Carol graciously accepted the award at the 2023 Annual TWS meeting in Louisville, Kentucky. As Carol took the stage to accept the award, a wave of emotion swept through the room. The audience witnessed a genuine and heartfelt reaction that reflected not only the significance of the honor but also the depth of Carol's passion and dedication.

Carol Chambers is a professor of wildlife ecology at Northern Arizona University and is Past President for The Wildlife Society (TWS) and a longtime member and supporter of the Arizona Chapter of The Wildlife Society. She is a dedicated researcher with an impressive list of publications, showcasing her commitment to the field of ecology and biodiversity. For some time now, she has been studying bats in Nicaragua, examining the impact of forest fragmentation. Through Carol's work in the region, she has identified at least 10 new bat species and helped establish a comprehensive dataset of bat occurrences in Nicaragua. In more recent years, Carol began studying the New Mexico meadow jumping mouse, a federally endangered subspecies endemic to the southwestern U.S. She has conducted stable isotope analysis, examined movement patterns, and identified successful survey methods for this subspecies.

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When nominating her for the award, her supporters stated, “We have repeatedly seen, firsthand, how Carol’s leadership in the wildlife profession has dramatically changed careers, projects, and people inside and outside of our profession, for the better. Her critical mind, creativity, passion for wildlife and wildlifers, willingness to be open and wrong, and her strong moral character have influenced thousands and likely tens of thousands of wildlife professionals and the animals/habitat/systems they work to conserve.”

Carol has been leading efforts in TWS to make the wildlife profession more inclusive. In 2010, she was instrumental in forming the group Women of Wildlife (WOW). Since then, WOW has held meetings, receptions, and symposia to bring together women in wildlife as well as men who support them. Along with Kerry Nicholson, Carol edited the book *Women in Wildlife Science: Building Equity, Diversity, and Inclusion*, which was published in 2022. The book celebrates achievements of women in the wildlife profession. It also discusses challenges faced by women and how the profession could be more inclusive.

In conclusion, Carol’s acceptance of this prestigious award marks a testament to her unwavering dedication, exceptional leadership, and significant contributions to the field of wildlife science. This recognition serves as a milestone in her illustrious career, highlighting the impact of her work and the admiration it has garnered from peers and the broader community. Carol serves as a source of inspiration, motivating others to make a positive impact and encouraging them to follow in her footsteps.

Get Involved with AZTWS!



AZTWS has open vacancies for Chair Committee positions. Join us and make a difference in your Arizona wildlife community. The following positions are available:

1. *Conservation Affairs Chair* — This position includes review of regulatory, planning, environmental, and other issues related to wildlife and their habitat in Arizona. Duties include soliciting, recommending, and preparation of materials related to conservation issues. The Chair is also responsible for an annual summary of conservation affairs to be distributed in the AZTWS Annual Report.
2. *Events and Opportunities Chair* — This position involves acquiring information related to events and opportunities that may be of interest of Chapter members and distributing them to committee members in charge of Chapter outreach.

Please contact us at aztws@gmail.com to inquire.

Bat Conservation in the Southwest through Collaborative Monitoring

By Kathy Gerst, Conservation Research Coordinator, Bat Conservation International



Canyon bats (*Parastrellus hesperus*) are Arizona's smallest bat species. Credit: Michael Durham

Many North American bat species are imperiled, but *how* do we know this? We need information about population sizes and ranges from *before* and *after* they encounter threats or experience change. This can be determined using long-term monitoring.

The [North American Bat Monitoring Program](#) (NABat) allows for managers and scientists to standardize bat monitoring and understand the conservation status of bats across North America. To understand what is happening with our bat populations, NABat uses multiple types of data, including acoustics, colony surveys, and capture records. If all biologists use the same methods for collecting this data to monitor bats at the same locations annually, we can compare data across time and

space. This allows us to understand changes in species distribution across large scales as well as smaller, local levels. Armed with this knowledge, we can identify which bat species have populations that are declining and develop conservation strategies to protect them.

One of the most specialized methods for assessing bat presence is acoustic monitoring. We use bat detectors, devices with specialized microphones for recording ultrasonic sounds that many bats make when they echolocate to hunt and navigate through the environment. Each species has a unique “shape” to its call, and we use both computer algorithms and human experts to determine which species made the recorded calls.

Monitoring bat populations is important work that couldn't happen without strong partnerships and collaborations. How else could we monitor sites all around North America at the same time? That is where the [Southwest Bat Hub](#) comes in. **We focus on coordinating bat monitoring efforts across Arizona and New Mexico.** We have partnered with dozens of groups, including tribes, federal agencies, state agencies, and local conservation organizations, to make sure they have the resources they need to contribute to the NABat database and gain knowledge about the status and trends of bats on the land they manage so they can better protect local bat populations. We are always looking for new partners to help with monitoring!



Pallid bats (*Antrozous pallidus*) are nimble enough to scoop insects off the ground. Credit: Sarah Robinson

Interested in learning more and participating? Please reach out to us at swhub@batcon.org.



AZTWS News & Resources

The [Arizona Chapter of The Wildlife Society](#) is dedicated to promoting sound management and conservation of Arizona's wildlife resources and strives to be the preeminent resource for Arizona's community of scientists, managers, educators, students, technicians, planners, and others working to manage and conserve wildlife and habitats in the state. To help you keep up with AZTWS's resources, opportunities, and happenings, we hope that you find the following hotlinks useful:

- **Members** gain access to numerous opportunities; if you are not yet a member, sign up [here](#). Annual dues are only \$6!
- **AZTWS's Web Store** is live! Show your support by gifting cool AZTWS swag to others (or splurging for yourself). Proceeds support AZTWS resources, including conference events and our Continuing Education Grant. [Shop now!](#) [You can also support AZTWS's Mission by [donating](#) discretely or in monthly recurrences.]
- Support others and help increase representation in Arizona's natural resource fields by **gifting a AZTWS membership** (1-year) – [details here](#).
- Looking for that older issue of *The Arizona Wildlifer*? **All issues** are freely accessible [here!](#)
- Our parent society, TWS, emphasizes important resources for **[diversity, equity, and inclusion](#)** throughout the wildlife profession. AZTWS also strives to uphold these values.
- Want to get more involved with your Chapter? Check out the information available on our [Facebook](#), [Twitter](#), and [website](#) for opportunities.
- AZTWS has vacancies for several Committee Chair positions. See [page 11](#) for details.
- Have questions for us? Contact us [here](#).



Arizona has both desert and Rocky Mountain bighorn sheep. Can you tell the difference? Credit: Scott Sprague