



# THE ARIZONA WILDLIFER

2022 Issue I

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Winter Edition

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## The President's Message



AZTWS President Ho Yi Wan with his son and daughter.

I am pleased to announce that the 2022 Joint Annual Meeting of the Arizona and New Mexico chapters of the American Fisheries Society and The Wildlife Society (JAM) is currently open for registration! The meeting will be held on 3–5 February and will be fully virtual. In addition to oral and poster presentations and plenary sessions, the meeting will have a wide array of events, including a photo contest, networking lunch, Quiz Bowl, resume workshop, etc. Please show your support to wildlife

and to the Chapter by joining us for this wonderful event. Also, please submit your abstract to showcase and present your projects and research. We look forward to seeing and networking with you all!

In the previous issue, I detailed three key reasons why the Executive Board Officers decided to hold JAM in a virtual format. The primary reason was to ensure the safety of our members and attendees during this unprecedented pandemic. Our decision was data-driven, based on the numbers and trend of COVID-19 available at that time. We still do not know what the future holds, but now with the wave of the Omicron variant, we are even more confident in our decision to move JAM online. Particularly, COVID-19 cases in Arizona have spiked more sharply than most states since my last President's message.

Arizona ( <a href="#">source</a> )	15 Sep 2021	15 Dec 2021	Percent Change
New cases	2,432	3,249	+33.6%
7-day avg.	2,701	3,200	+18.5%
Deaths	29	81	+179.3%
7-day avg.	36	78	+116.7%

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## Presidents Message cont...

Another decision that we had to make was the pricing of the event. After many months of research and negotiations with virtual conferencing service vendors—and thanks to the excellent financial analysis done by our outstanding treasurer, Dr. Kerry Griffis-Kyle—we think we have found the most valuable package. The registration pricing for JAM is as follows:

- Student – \$80.50
- Member – \$106.00
- Non-Member – \$131.50

I assure you that the above numbers reflect our dedication and efforts in trying to bargain for the lowest price points for everyone while providing the most pleasurable and seamless conference experience. Among the students that I have personally spoken with, they have all expressed that such pricing is very generous and much cheaper than most other conferences that they have attended during the pandemic. Additionally, many students have indicated that virtual conferences are more affordable to them due to the cost savings from not having to pay for travel and lodging. That being said, many students might still be excluded from attending JAM due to financial constraints. Therefore, I encourage everyone to please consider donating to the Reed Sanderson Award. This is a great way to help sponsor students to attend JAM and to help foster the next generation of wildlife lovers.

I acknowledge that our decisions might not always satisfy everyone. Decisions are hard because things are not always just black and white. Often, it's a matter of tradeoffs. Either side of the equation can be right, but somehow, we are required to pick one. We sincerely hope that any differences in opinion can be resolved and mended by your love for wildlife and by your support and loyalty to the Chapter.

One final note, I am extremely pleased to welcome David Bergman to join the AZTWS Executive Board as the new President-elect of our Chapter. Our former President-elect, Dr. Zaneta Kaszta, had to leave her position due to family reasons. We thank her for the exceptional service that she provided.

~Ho Yi Wan, President of AZTWS

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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](mailto:aztws@gmail.com) to inquire.

# Our Neck of The Woods...

## My Journey of Scientific Discovery: Acoustic Bat Monitoring in Phoenix, Arizona

By *Jessie Dwyer,*  
*M.S., Arizona State University*



Jessie carrying bat acoustic monitoring equipment on the Estrella Mountains, Arizona. Credit Jessie Dwyer.

Ever since I can remember, I have always loved animals. As a kid, I carried stuffed animals with me wherever I went, begged for every type of pet you could imagine, and pursued any opportunity that would allow me to take care of animals. I especially had a soft spot in my heart for animals that were mistreated and misunderstood. For example, when I was very young, my mom dragged me on shopping trip to an antique store. While wandering around, I stumbled upon the ugliest kiwi stuffed animal on the face of the earth. I desperately wanted to take the kiwi home, but my mom refused. I cried for days, worried sick that the kiwi was so ugly that no one would ever take them home and they would be alone forever. Eventually, my dad took me back to get the kiwi who I still have to this day. It has always been clear to me that my purpose in life was to save as many animals as I possibly could. I dreamed of filling my house with rescued cats and dogs and working at a wildlife sanctuary. But it wasn't until I started my undergraduate program in Applied Biological Sciences (ABS) at Arizona State University that I learned I could make an even bigger impact by researching and managing wildlife populations, communities, and entire ecosystems.

As I was making this revelation, I heard that the new professor in the ABS program, Dr. Jesse Lewis, had extensive experience researching mammals and was developing a wildlife camera project in the Phoenix metropolitan area. In the spring of 2018, I sat in his office, anxious, but passionate and determined to work as a masters student in his lab. Unfortunately, I learned that there was another student already working on the wildlife camera project. As that door closed, another door opened. Dr. Lewis explained that there was another project he wanted to start—acoustic bat monitoring. He had never conducted research on bats (nor had I), but he wanted to understand the entire desert wildlife community in the Phoenix metropolitan area, not just ground-dwelling vertebrates. I didn't know much about the mysterious creatures of the night, except that people generally thought bats were scary, blood-sucking, and disease-ridden. I quickly realized that bats were largely misunderstood. I learned that bats are very ecologically important, that most widely held beliefs about bats were myths or exaggerated, and that bats were, dare I say, cute! It was clear that, like unwanted stuffed animals, I had a soft spot in my heart for bats, too. I was fortunate enough to spend the next few years researching this fascinating group of animals, and little did I know, it would also lead to a journey of self-discovery.

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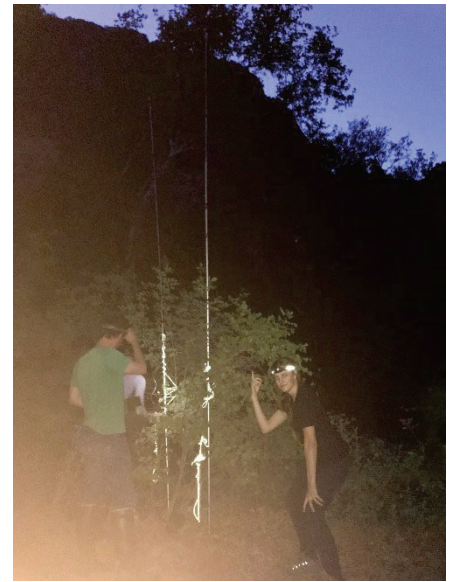
After I decided to move forward with the acoustic bat monitoring project, I had some daunting tasks ahead of me. First, I needed to learn how to survey bats with acoustic monitors and how to identify species based on their echolocation call characteristics. In May of 2018, my advisor and I headed to the Chiricahua Mountains in southeastern Arizona to participate in a Bat Survey Solutions workshop. We learned how to capture bats with mist nests and harp traps and how to record bat echolocation calls with acoustic monitors. This workshop was an incredible learning opportunity and prepared me for the entire process of acoustic bat monitoring, including setting up acoustic monitors, processing data, and using species identification software to identify bats by their echolocation call characteristics, such as frequency, bandwidth, and duration. Now that I had this expertise under my belt, it was time to design my study.

We wanted to understand how bat populations and the bat community were responding to urbanization—a pervasive and expanding driver of landscape change. Particularly, we were interested in conducting the study in an arid region, where there can be drastic contrasts in resource availability across seasons and between wildland and urbanized areas. Bats in arid regions were largely understudied and this project would provide the opportunity to gain fundamental knowledge on desert bats. We expected that bat response to urbanization would be species-specific, with some species being more sensitive and others being more tolerant of urbanization. In addition, we expected bats to increase use of urbanized areas in the summer season, where food and water resources were expected to be greater compared to wildland areas. Lastly, we expected that species richness (i.e., the number of different species in a given area) would either be highest in wildland areas or moderate levels of urbanization, depending on how many species exploit resources in the urbanized areas.



An example of cryptic placement of bat acoustic monitoring equipment.  
Credit Jessie Dwyer.

To evaluate these questions, we wanted to survey 50 sites along a gradient of urbanization in the Phoenix metropolitan area, which was no small feat! I scouted more than 200 potential sites, sent permission letters to property owners for many of those sites, and after eight long months, received permission to survey bats at 50 sites with varying levels of urban intensity. We faced multiple challenges when designing this study. First, many of our sites were located in areas with high human activity. We were careful to secure our equipment by hiding the monitor and pole within the canopy of the tree, camouflaging the equipment with spray paint and leaf blankets, and locking the monitor in a lock box. Thankfully, we did not lose any monitors during the course of our study. Second, we were concerned that various sounds in the environment may interfere with our acoustic surveys. To mitigate potential sound interference, we did not place monitors next to roads, under power lines, within vegetation, or directly above pavement or water surfaces. Lastly, we only had ten acoustic monitors at our disposal. In order to survey all



Janet Tyburec, Dr. Jesse Lewis, and Jessie Dwyer setting up acoustic bat monitors during the Bat Survey Solutions workshop in the Chiricahua Mountains, Arizona.  
Credit Jessie Dwyer.

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50 sites within an independent season, I needed to rotate monitors every weekend during each season. I learned more about the Phoenix metropolitan area driving around for this project than I did in the previous 24 years of my life! Despite these challenges, the project went relatively smoothly and we collected some fantastic data.

Across all 50 sites and each of the four seasons of 2019, we recorded more than 130,000 calls. Although the species identification software attempts to automatically identify species, I needed to manually vet each and every call. Identifying bat species acoustically can be challenging, as some species share similar call characteristics, multiple bat species can appear in one sound file, and there is a high volume of sound files to sort through. After many, many months of species identification, I identified a total of 14 bat species in the Phoenix metropolitan area, with the most bat detections in the summer and least in the winter season. However, the hard work did not stop there. I needed to evaluate the effect of urbanization on each bat species during each season, as well as on the bat community. First, I used various single-species occupancy models to evaluate occupancy (i.e., probability of presence of a species) and relative habitat use of bat species across the gradient of urbanization and across seasons. Then, I used multi-species occupancy modeling to evaluate species richness of bats across the gradient of urbanization in the summer season.



Townsend's big-eared bat captured during the Bat Survey Solutions workshop in the Chiricahua Mountains, Arizona. Credit Jessie Dwyer



Hoary bat captured during the workshop. Credit Jessie Dwyer

We found that bat species exhibited different responses to urbanization, with some species more sensitive (big/pocketed free-tailed bat, canyon bat, hoary bat, silver-haired bat, western mastiff bat, western red bat) and other species more tolerant (California myotis, Mexican free-tailed bat and western yellow bat) of urbanization. In addition, we found that most bats did not increase their use of urbanization in the summer and were consistent with their response to urbanization across seasons. However, two species (big brown bat and Yuma myotis) exhibited higher use of urbanized areas in the summer season compared to other seasons. Further, we found urbanization had an overall negative affect on the bat community, where species richness of bats declined across the gradient of urbanization. This was consistent with our other findings, as most bat species were sensitive to urbanization and exhibited the highest use of wildland areas.

These results have important conservation and

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management implications. Bats in our study were largely sensitive to urbanization, even in the summer season, where food and water resources were assumed to be more widely available in urbanized areas compared to wildland areas. Therefore, sensitive species are still avoiding urbanized areas despite seasonal changes in resources. Further, bat response to urbanization is likely related to species-specific traits, where wing-shape, diet, and sensitivity to human disturbance influences how they interact with their environment. Management efforts may focus on monitoring and managing sensitive species around urbanized environments as urbanization continues to expand across the globe. In the future, it would be very interesting to see more direct connections between species traits and response of bats to urbanization, so that we may predict which species will need to be closely monitored across various urbanized regions. Overall, I am immensely proud of the what we accomplished and excited what the future of bat research will hold.

Working with bats was a very interesting and rewarding experience. I am grateful for the expertise and knowledge I gained throughout my graduate program. However, I would not be telling the entire story without mentioning how much of a toll this experience took on my mental health. Part of it was the nature of graduate school, part of it was the global pandemic, and part of it was my own internal struggles. I came to understand that, much like bats, I was hiding in the back of a deep, dark cave, avoiding the harsh judgement of the daylight. It's clear to me now that the reason I have a soft spot for the maligned and misunderstood creatures, like bats, large carnivores, and unwanted stuffed animals, is because I, too, feel maligned and misunderstood. As a scientist, it is my job to shine a spotlight on what we don't understand, embark on a journey to understand it, and communicate my findings to the world. I think it is time for me to embark on the journey of understanding myself. I looking forward to what I will find.



The author. Credit Jessie Dwyer.

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# THE 2022 AZ/NM CHAPTERS OF THE WILDLIFE SOCIETY AND AMERICAN FISHERIES SOCIETY JOINT ANNUAL MEETING

**When:** Thursday, February 3 - Saturday, February 5

**Where:** Virtual



## [Registration](#)

- Student – \$80.50
- Member – \$106.00
- Non-Member – \$131.50

## [Abstract Submission](#) (due 14 Jan)

**Many opportunities to Learn, Network, and Engage!**

For question, inquire to: [arizonatws@gmail.com](mailto:arizonatws@gmail.com)

Visit Conference Website for more information  
<https://sites.google.com/view/jam2022/jam-home>

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# BioBlitz

Calling on all Arizona Citizen Scientists

Help us plan and host the 2022 Blitz!

When: 9–11 April 2022

Where: Hassayampa Ecosystems

Main base will be at [White Tank Mountain Regional Park](#) (group camping will be available)

**What is a BioBlitz?** A BioBlitz is an intense period of biological surveying in an attempt to record all the living species within a designated area. Teams of volunteer scientists, naturalists, teachers, students, families, and other community members work together to find and identify as many species of plants, animals, microbes, fungi, and other organisms as possible during a certain time and place (usually 24 hours). There is a public component to many BioBlitzes, with the goal of stimulating interest in biodiversity.

Interested in helping plan and/or execute the AZ BioBlitz? Please consider volunteering [here](#). More details to come, including how to register as ‘Blitzers’ or subject matter experts (SMEs) to lead excursions.

Questions? Contact [AZBioBlitzHub@gmail.com](mailto:AZBioBlitzHub@gmail.com)



# 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*

Issue	Deadline
<b>Spring 2022</b>	<b>Mar 18, 2022</b>
<b>Summer 2022</b>	<b>Jun 17, 2022</b>

Email submissions at any time to [aztwseditor@gmail.com](mailto:aztwseditor@gmail.com).

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## Continuing Education Grants

AZTWS offers \$2,500 annually in Continuing Education Grants to its members (including professionals, graduate and undergraduate students) to support education and career advancement opportunities. 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.

Submit Your  
Application Online



# 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 2](#) for details.
- Have questions for us? Contact us [here](#).

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A western spotted orbweaver taking advantage of a desert stream’s dry ephemeral reach in the Pajarita Wilderness. Credit Brian Blais.