



BioNews 2022

Department of Biology
Pittsburg State University



From the Chair's Desk

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Bobcat in Pittsburg seen recently with a camera trap.



Dr. Bobby Winters

This is my second year as Interim Chair of the Department of Biology. Last year I could blame all of my short-comings on being new at the job, but this year that excuse is gone. Some of that ignorance has been erased, however, as this year the Department of Biology is going through program review, and, as Interim Chair it fell to me to write the self-study.

Among the many things I've learned is that within the faculty of the Department of Biology are some of the most caring, talented, and professional faculty I've seen. They love both their students and

their subjects: That is a combination that is hard to beat.

There have been challenges. The department has been blessed with vehicles to use on fieldtrips. Some of the vehicles have seen better days. It was fortunate the College of Arts and Science was able to purchase a 14-passenger van that Biology will be able to share. This has helped immeasurably, but the field faculty is so active it is hard to cover their needs completely.

After 30 years at PSU, I still think of Heckert-Wells as being a new building. I've been shocked to discover that it is no longer new—and neither am I. The students come in with expectations created from the larger world, and our facilities are measured against those expectations. We have been paying attention to this, and we've received some help from the College of Arts and Science and the upper echelons of the university for the last couple of years in the form of upgraded labs. This year the attention is on the lab we use to teach Human Anatomy and Dissection. This course has been a distinctive component of our curriculum through the years. Our students entering the medical profession have skills in this area that those from other schools lack. We will upgrade our these facilities during the coming summer and I look forward to seeing the newly refurbished labs.

I would be remiss in my duties, if I did not remark on the K-INBRE conference, which I attended for the first time. Let me say again, how proud I was of our

faculty and students, as they represented Pittsburg State. The Biology students and faculty stand out. I am proud to be a facilitator for them.

To our alumni: Please feel free to send Dr. Neil Snow updates on your accomplishments and whereabouts at nsnow@pittstate.edu or contact me at bwinters@pittstate.edu. Have a great year.

Bobby Winters

Associate Dean of the College of Arts and Sciences, and Interim Chair



Top: PSU biology students spent an afternoon in August working with the Kansas Department of Wildlife & Parks to collect and count mussels on the Neosho River. Bottom: Welcoming the newest cohort of field biology students in Ecology and Field Biology Orientation for the Fall 2022 semester.



Dr. Christine Brodsky

Once again, our fantastic students made this year's worth of classes and research fun, productive, and quite memorable.

I was lucky to have a wonderful group of students this year for Human Dimensions, Mammalogy, Ecology & Field Biology Orientation, and Environmental Life Science. In addition to these regular courses, I prepared and taught a new course "Introduction to Undergraduate Research" for all undergrads interested in any aspect of STEM research, particularly for our K-INBRE Scholars. It was a great group and I'm excited to teach this course again this upcoming Spring.

The Brodsky lab has been quite active this year, especially with new Master's students Jenell de la Peña and Daniel Benson joining us to work on the KS-statewide spotted skunk research project. Jenell and Daniel have been working with collaborators and many PSU students to deploy 600 game cameras across 18 counties in Kansas – quite a large task! Emma Buckardt (co-advised with Dr. George) successfully defended her thesis "Amphibian occupancy and diversity on a post-mined landscape" in October and already has manuscripts submitted for publication. Luke Headings (co-advised with Dr. George) is wrapping up his thesis "Evaluating bird and vegetation communities on mined lands in Southeast Kansas" in the upcoming Spring 2023 semester. MS alumna Amy Hammesfahr (2020) published the final two of her three thesis chapters this year in *Acta Chiropterologica* and *Transactions of the Kansas Academy of Science*. Overall, it has been an extremely productive year due to our exceptional graduate students – congrats to them all!



Left: Miranda Hallacy, and Renee and Leann Trout deploying game cameras for the camera-trapping project run by the Smithsonian. Right: New MS students Daniel Benson and Jenell de la Peña with a game camera in western Kansas, deployed in the hopes of capturing the elusive spotted skunk.



Ongoing research efforts have continued in my lab, particularly the urban biodiversity research and Snapshot USA. Early this year, my UrBioNet colleagues and I published a literature review covering 1,209 urban biodiversity publications. We are all glad that this paper is finally published! Biology students and I also ran our fourth year of data collection for Snapshot USA. It was a joy to have Austin Abram, Khloey Stringer, Noah Sherwood, and the Fall 2022 Mammalogy class to assist with Snapshot USA field work and data analysis. Snapshot data collected in 2020 and 2021 are currently published / in review in *Ecology*, coauthored by PSU alumnus Caleb Durbin (currently a MS student at K-State). This November, I was also lucky enough to present a collaborative Snapshot USA research project ("Mammalian functional trait responses to anthropogenic and environmental factors across the contiguous USA") at the URBIO conference in Leipzig, Germany.

It has been a privilege serving as the K-INBRE Campus Coordinator for a third year, working with our exceptional K-INBRE Scholars and faculty mentors. In 2022/2023, the faculty and 16 student Scholars were awarded \$138,000 to conduct research. K-INBRE Scholars Caine Duran (Chemistry) and Paul Worsley (Biology) won awards at the 2022 Annual Symposium for their oral and poster presentations, respectively. Congrats to all of our student research Scholars!

Best wishes to all for 2023!



Dr. Mandy Peak Bryan

Hello Gorillas! I am pleased to report we had a successful year for students applying to professional schools. The following students started professional school in 2022: Tayita Abudu, Audriana Angeles, Mack O' Dell, & Hannah Zerr (KU-School of Medicine); Quin Reasoner, Annie Moody, and Abbie Moody (UMKC School of Dentistry), and Kyler Seibert (AT Still School of Dentistry); Lyssa Schabel (Arizona College of Optometry-Glendale); Rocky Kyser (UMKC Master of Science in Anesthesia); Emily Winter & Saydi Sullivan (Cleveland Chiro); and Tevin Taylor (UMKC Pharm). Students started their first year of Physicians Assistant school in 2022 include Jenny Denton (Oklahoma State), Kate Dreiling Bennish (Northeastern State University), Kaci Hultz (Missouri State), Monica Jirak (Wichita State), Chad Merando (K-State), and Riley Zerr (Spencer College).

In addition, our students were accepted into medical school early admission programs. Aaron Higginbotham was accepted into KU med and will begin medical school in 2023. Marissa Vail was accepted into the Partners Program with KCU and will also begin medical school in 2023. Please read more about Marissa here: (<https://bit.ly/3w4TCOi>) Also, biology students Kady Matlock, Taylor Wixson, Madeline Murdock and Ashlyn Potter were accepted into the KU Scholars in Rural Health Program. Several of our senior pre-health students have been accepted into various medical, dental, and PA schools and others are awaiting acceptance notifications in March. We will update you next year on the students' decisions!

Several PSU Bio alumni graduated from professional schools in 2022, including: Dr. John Allen (UMKC dental), Dr. Wesley Brantley (OSU DO), Dr. Gage Davies (KU med), Dr. Zach Denton, (KU med), Dr. Lacy Greve (KU med), Dr. Nathan Grimaldi (KCU DO), Dr. Alex Hill (KU med), Dr. Carlin Hill (ARCOM DO), Dr. Brandy Lawrence (Oklahoma State Vet Medicine), Dr. Katelynn Main (ARCOM DO), Dr. Rosa Mendez (KU med), Dr. Allie Moody (Illinois Optometry), Dr. Dylan York (AT Still DO), and Dr. Nick Wuthnow (Cleveland Chiro). Also, Kris Bird (Missouri State), Emily Jungling (St. Mary), Tyler Drisdell (KU), Colton Erikson (SBU), and Jordan Puvogel (SBU) graduated with their Doctor of Physical Therapy. And Hayley Hansford (Wichita State), Arli Hendrix (St. Louis U), and Katlin Loos (Wichita State) graduated from their Physician Assistant Programs. Congrats!!

Pitt State Biology is on Facebook and Instagram! Please follow us on social media for departmental pictures and stories about our students. <https://www.facebook.com/PittStateGorillaBiology> and <https://www.instagram.com/pittstatebiology/>

More Alumni Updates

Kelly Mallat is attending the University of Virginia and is an Assistant Project Manager with Keller North America, a global geotechnical engineering contractor. She and her husband recently purchased a rural Victorian farmhouse, where she is enjoying her new garden.

Maggie Murray continues working with Stantec and is a team leader working on some wind projects locally.

Madeline Gay now works at Lacreek Wildlife Refuge as Wildlife Management Specialist (see p. 17).

Caleb Durbin is a MS student at K-State, supervised by Dan Sullins.

Morgan Smith started her MS in Psychology here at PSU.

Peyton Witham is the Remedial Project Manager at EPA in Region 7. Griff Hoffman is also with EPA as a Federal On-Scene Coordinator.

Jake Wright completed his MS from Wichita State University and now works for Western EcoSystems Technology (WEST, Inc.)



Dr. Peter Chung

Greetings. Another year has come and gone so quickly. Microbiology continues to keep me busy, along with a new course I am offering, Infectious Diseases, and the re-introduction of our Immunology course. Our students in professional schools have indicated a need for these courses, so I am happy to continue to improve our pre-professional curriculum.

Both of my graduate students have completed their Master's in Biology. Congratulations to Siqi Wang and Enrico Aveiro Johannsen. Congratulations also to Mary Gathoni, Dr. Harries graduate student, who spent a stint in our research lab culturing cells and keeping our lab afloat, especially once we received our big research administrative supplement grant. Carlie Payne has joined us as our full-time undergraduate researcher and we look forward to mentoring them with her research project.

The number of prospective students interested in professional school continues to increase, not only in the traditional pre-health sciences (medical, dental, etc.), but also in medical technology and pre-physical therapy Biology majors. Aside from the many prospective student visit and university wide recruitment events, we have also been busy with advising and other service opportunities. Our Science Day in April, our first since we shuttered for the pandemic, successfully came and went. It goes without saying Science Day will be permanently moved to April! Many thanks to the students and Biology faculty who helped with the Quiz Bowl; special thanks to Dr. Neal Schmidt and Mack O'Dell for their time and patience with the countless cadaver tours given! We held our annual PT Open House for the first time during Physical Therapy Month, in October and we had a great visit with school representatives. And so did our students!

A few more thoughts....I am still meeting with prospective students interested in our Department. Contact me if there is someone you would like us to meet with. I am still marshalling at graduation ceremonies, so if you ever make it back... There is always more to be said, but I leave you with my usual farewell: To all our graduates, colleagues and friends, do not be strangers; stay in contact, keep in touch, and do stop by and visit if and when you are in town. Regards, Peter Chung (pchung@pittstate.edu)



Left: Wildlife Club bake sale, Fall semester (L to R): Tabitha Caruthers, Isabelle Villafañe, Khloey Stringer, Belle Pfeifer, Kiowa Stark, Talya Crouch. Right: Members of the PSU Wildlife & Fisheries Society joined our friends from Emporia State University to volunteer with Sea Turtle, Inc. on South Padre Island, Texas, during Spring Break.



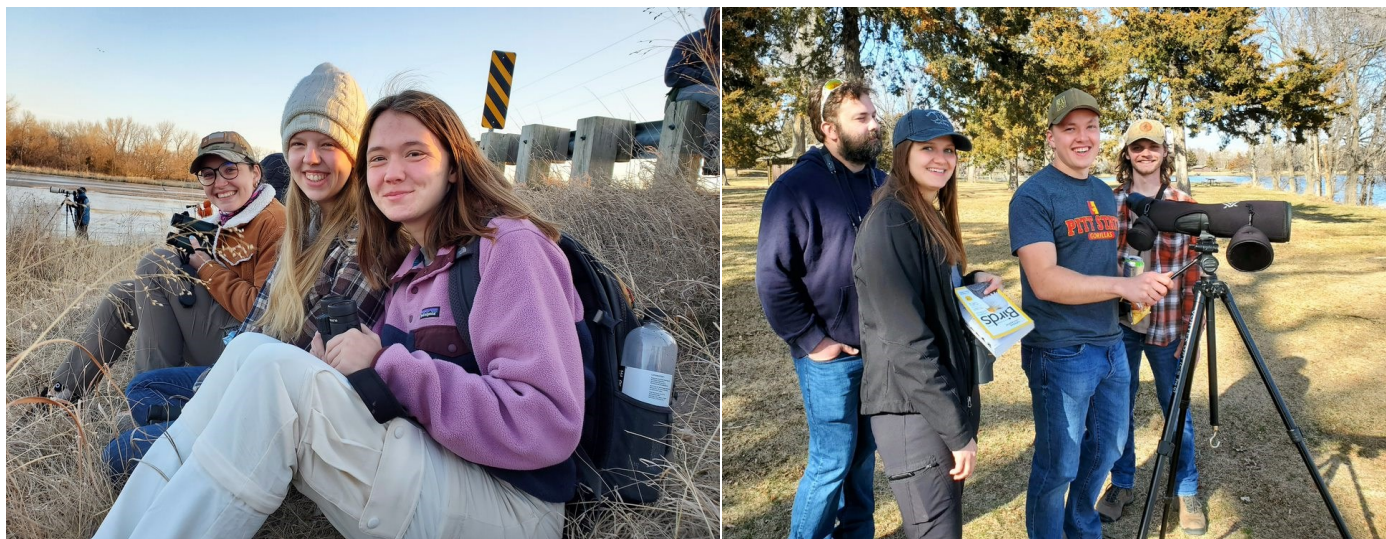
Dr. Andrew George

Greetings! As always, there is far too much to report in the limited space of a newsletter. Here are a few highlights.

Spring 2022 was my third Ornithology class at PSU, and the best semester yet. We had to open a second section to accommodate what was the largest Ornithology enrollment in PSU history. As our field program has grown, so has the popularity of our classes with an additional record enrollment for the upcoming spring 2023 Herpetology class! The highlight of the semester was our 3-day trip to the Platte River, Nebraska, to view the Sandhill Crane migration. The students are always amazed by the sights and sounds of 30,000+ cranes taking flight from the icy river at dawn. Later during the trip, we had excellent views of displaying Greater Prairie Chickens. Special thanks to our grad assistants Mary Marine and Luke Headings, who helped lead the crane trip and

many local outings.

Several of our grad students concluded field work for their projects in 2022. Haley Price, Luke Headings, Mary Marine, Emma Buckardt and their field assistants had successful final field seasons. Haley tagged more than 1000 gray bats at a local roost and used acoustic detectors to document bats at many locations across the region. Luke and Mary used point counts to survey birds on their respective projects in southeast Kansas and the Missouri Ozarks. Luke's project is one of the first to describe bird communities on abandoned mined lands. Mary's work in 2022 represented the 31st year of MOFEP, which is one of the oldest and well-known examples of a landscape-scale experiment. Finally, Emma successfully defended her thesis on amphibian occupancy on mined lands. Emma did an outstanding job with her research, as attested by her growing list of awards and peer-reviewed publications. Congrats, Emma! Stay tuned for more news from our amazing cohort of grad students as they wrap up their projects and begin their careers as wildlife biologists.



Ornithology field trips. Left (L→R): Isabelle Villafañe, Jossie Shumaker, Tessa Poolman, birding in Nebraska. Right: Kit Garvin, Sara Scholes, Jeremiah Casner, and Austin Abrams.

The PSU Wildlife and Fisheries Society has continued to bring together students in our field programs. Among the many highlights of 2022, the most memorable was their long-awaited field trip to South Padre Island, TX. Members of the club joined our friends from ESU on a project to volunteer with Sea Turtle, Inc. The 13 students spent the week building a corral on the beach to protect nesting Kemp's Ridley Turtles. We're looking forward to another coastal trip in March 2023, this time led by Dr. Whitney.

One of the most exciting new projects of 2022 is the Kansas Motus Network. I am working closely with colleagues from K-State and Emporia State to establish a network of automated telemetry stations across eastern Kansas to study movements of birds and other migratory animals. We've rapidly grown from two stations in 2021 to twelve at the end of 2022, with plans to add several more in the first half of 2023, including a station on PSU property. Check out www.kansasmotus.net for more info or to support the project.



Dr. Anu Ghosh

Hello everyone! This has been a prosperous year in terms on mentorship and scholarship.

In March we made a fruitful connection with Girard High School (see p. 19). My colleagues and current students visited with aspiring junior and senior students. This visit left a mark of our strong Biology program. We were delighted to have a few of those students attending Rumble later this year and also visiting the department as a prospective student.

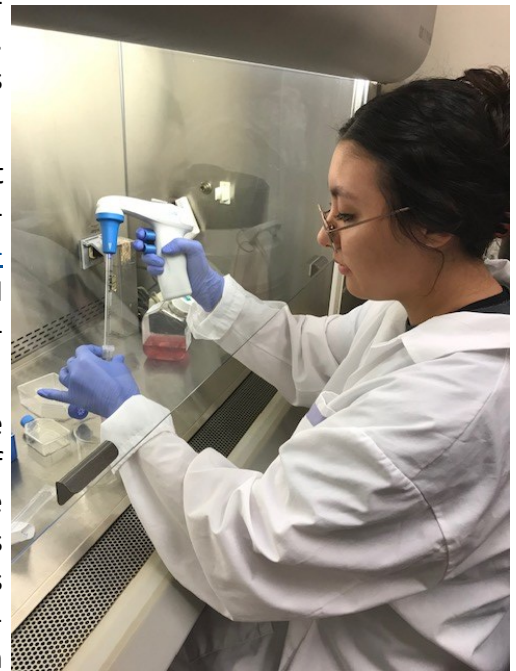
I taught my regular course load which comprises two core biology major courses (POBI and General Microbiology) and a few upper-level electives (Environmental Health, Microbial Physiology, Basics of Human Toxicology). Besides I taught fully-online General Biology lecture and coordinated General Biology labs that were taught by GTAs Bobbi Monroe, Alexandra King, and Danielle Evilsizor. Thank you all for the great work you did throughout the semesters! Noteworthy, in the microbial physiology lab. we have successfully used the CRISPR molecular technique to edit microbial genomes.

CRISPR has immense applications in human health and disease prevention. Students appreciated this learning opportunity as undergraduates.

Over the summer, there was a big addition to our departmental research front. With the help of our KINBRE campus coordinator Dr. Brodsky, we purchased an Illumina MiniSequencer equipment. This will expand our scope of research and publications in future.

The internship program in "Pre-Veterinary Medicine" initiated last year has had three interns and many more to join. (See Andra Stefanoni's article here: [Interested in becoming a veterinarian? Unique experiences at PSU help.](#) We prepare pre-vet students for their DVM programs and appreciate scholarship funds focusing in this area of emphasis.

Students' success in professional life and progress in personal life brings me immense joy and fulfillment. I would like to share few of these. My Masters student Ms. Bobbi Monroe received a competitive graduate assistantship from the Kansas Academy of Science. Her thesis focuses on metagenome analysis of local bat population. My previous graduate student Ms. Leah Cuthill has enrolled in a PhD program under Entomology known as Agriculture Food and Life Sciences (AFLS) in University of Arkansas, Fayetteville starting spring 2023.



Melissa Vail, who works with Dr. Ghosh in cancer research.

My former undergraduate researcher Ms. Sara Goins is employed at Public Health Informatics division at Kansas Department of Health and Environment, Topeka. She accepted an offer to pursue a Master of Data Science in the prestigious Durham University, Durham, UK, next year. Former research scholar Ms. Sydney Nippoldt, who worked on our NSF-funded tick project, is now a laboratory assistant at Labette Health, Parsons. Another researcher from the same tick project, Ms. Hallee Belgum is currently a laboratory technician at Biospecimen Repository Core Facility at KUMC.

I am fortunate to mentor our excellent KINBRE scholars this year: Ms. Madison Reese, Ms. Niamh Dixon, Ms. Marissa Vail, Ms. Shelby Aikins, Ms. Taylor Michael. A few of them already presented their work at various conferences and received awards (listed later in the newsletter).

On behalf of our departmental scholarship committee, I would like to reach out to all our alumni and well-wishers. Any support in terms of endowment/scholarship for recruitment of outstanding incoming freshmen is highly appreciated. We are grateful to include two new scholarships this year: Dr. Calvin and Mrs. Mary Mein Leadership Scholarship and The Freeman Health System HOSA Scholarship for the pre-med program. Please feel free to contact me (aghosh@pittstate.edu) or our chairperson (bwinters@pittstate.edu) if you need any information.

Happy retirement to Dr. James Dawson on his 43 years of association with Biology Department. His selfless contribution to nurture our programs is beyond imagination. I am extremely fortunate to know him during his last few years of service. He has touched so many lives in many ways. Best wishes for him and his family!



Dr. Phillip Harries

Greetings from Heckert Wells! 2022 was another busy year but one that was full of rewarding interactions with students. One of the highlights of the year for me was having the opportunity to work with master's student Mary Gathoni (see p. 18) on a research project investigating the effects of several polyphenols on pancreatic cancer cells. This work was building on similar studies conducted by a previous student with lung cancer cells. Mary successfully defended her thesis at the end of the spring semester and is currently exploring options to continue her graduate education. Her project was only possible thanks to cells and cell culture expertise provided by Dr. Chung and data analysis assistance from Dr. Whitney. As someone who has always been interested in cancer research, this project was really a pleasure to be involved with. Not only did it allow me to delve deeper into a subject that I am excited about, but it also gave me the opportunity to work with a talented graduate student as they pursued their own research goals.

An unexpected highlight of the year came out of pre-health orientation 1 class. This is a course for freshmen pre-health majors that is intended to give them exposure to different medical professions through a diverse array of guest lecturers. One of our class speakers, Teresa Davenport was a cancer survivor who came to talk about her non-profit Care to Share organization that provides all kinds of support to local individuals as they undergo cancer treatments. Teresa's presentation was so compelling that it moved some of the students to start a Care to Share club at PSU. Freshmen Tristian Stevens and Alexandra Robinson led the charge and although this student group is just getting started, I'm excited to see where it leads in the future.

Overall, this has been a truly rewarding year, both personally and professionally. I am grateful to have had the opportunity to work with outstanding colleagues and students. I am looking forward to what the next year will bring!



Delia Lister

Hi everyone! I want to use the opportunity in this newsletter to shine a light on a former student and newly graduated student. First, Dr. Brandy Lawrence, a former Nature Reach Animal Keeper has joined Dr. Heather Wallace and staff at Broadway Animal Hospital, the clinic who generously donates many services to our program. She, along with another new veterinarian, Dr. Sarah Trammel, have been absolutely wonderful and bring more exotic animal knowledge to our community. Second, a huge shout out to Gizelle Sisson, who has been my “right-hand” student for Nature Reach; I am both sad and happy to see her graduate. I certainly could not have gotten through the last few years without her. I know she will do many wonderful things in her career.

Summer 2022 was certainly quite busy. I taught ELS as well as ran three summer day camps and a Pre-K Reading program. We have also been continuing to tweak all of our newly renovated raptor enclosures. I was lucky enough to attend a professional raptor training workshop at Natural Encounters, Inc. in Winter Haven, Florida. The training amazing and I am so excited to incorporate everything I learned into my Animal Care and Management Course. We have also recently added a red-tailed hawk and Harris’s hawk to our raptor ambassador team; they are in training, but I hope will become a valuable part of our team.

I am now the President of the Kansas Association for Conservation and Environmental Education (KACEE). This organization is doing such wonderful for in environmental education and I am so happy to be part of it a national leader in the profession. I was also appointed by Governor Kelly as a Commissioner for Kansas Department of Wildlife and Parks. It is an honor and I hope I can be of service for the agency.

I am always on the hunt for grants and outside funding to keep Nature Reach going. Please consider donating to the program. For more information visit our website: www.pittstate.edu/naturereach. This program has existed for the past 38 years because of generous donors!



Clockwise from top right: Dr. Sarah Trammel (L), Angie Dennis and Dr. Brandy Lawrence (R) treating Nature Reach’s Texas Tortoise at the Broadway Animal Hospital in Pittsburg; Kayano Vail sorting insects for Haley Price’s MS thesis work; Gizelle Sisson holding an American Kestrel at the Nature Reserve.



Dr. Neil Snow

Congratulations to Rachel Styers on defending her MS thesis on the distribution of Ravenna grass in eastern Kansas. She is looking forward to teaching Environmental Life Sciences in Paraguay in March.

Classes this year included: Evolution, Wetland Plants, Advanced Plant Taxonomy, Advanced Grass Taxonomy, a readings group in plant taxonomy, and two semesters each of Taxonomy of Vascular Plants and Graduate Seminar.

Departmental seminar speakers covered a wide range of topics, including: rare plants in Colorado; endocrine disruption in hamsters as a model study system for cancer research; plant polyphenols and their influence on pancreatic cancer cells; gut microbiomes; science teaching pedagogy; pollination and herbivory of rare plants in Florida; plants of the Cretaceous/Paleogene boundary; population demography of grassland birds; geography and ecology of birds globally; occupancy of amphibians on mined lands in southeast Kansas; population and demography of snakes; the weedy Ravenna grass; and using biodiversity informatics to assist with weed management.

Danielle Evilsizor, with field assistance from Tabitha Caruthers (see p. 18), completed her second field season studying Ozark Chinkapin (*Castanea ozarkensis*) in Roaring River State Park in Missouri. She presented a poster of preliminary results at the PSU Research Colloquium and the Missouri Botanical Symposium.

Michael Daines completed his second field season in Idaho documenting the flora of the Caribou-Targhee National Forest, and now is in the US Forest Service's Pathways program. I spent two weeks helping with fieldwork; combined we made over 1750 additional collections. Michael was lead author with nine other students and I in reporting thirteen county or state records (= first reports) of vascular plants.

Former herbarium volunteer Taylor Michael completed a summer internship with Dr. James Back at Wichita State University and plans to begin graduate school next fall at the University of Kansas.



Left (L-R): Tabitha Caruthers, Maggie Saul, Jamie Leeper, Jeremiah Casner, and James Loomis at Welder Wildlife Foundation (Texas) in March. Right (L-R): Jeremiah and Zach Garrett working on plant identifications.

An open house for the Sperry Herbarium in September was well attended and had good local press coverage. (See the new Herbarium URL for the 2022 annual report [https://www.pittstate.edu/biology/_files/documents/sperry-herbarium/22kspnewsletter.pdf].) Many thanks to PSU alumnus Mike Robinson for assistance mounting specimens as a volunteer. We sent ca. 550 herbarium specimens as gifts to Chadron State College (NE), Adams State University (CO), Texas A & M, and the California Botanic Gardens.

Personal highlights included: taking eight students to the Welder Wildlife Foundation over Spring Break; election as a Fellow to the Linnean Society of London, the oldest continuously operating organization devoted to the study of natural history; welcoming Freshman and recent transfers who are interested in the Botany emphasis; and becoming a member of the Lewis and Clark County (Montana) Noxious Weed Management Board given my teaching and interests in invasive species. (Always happy to coordinate the Newsletter, too!)



Dr. James Whitney

During 2022 we worked on Blake Hansen's thesis project on the San Juan River in the Four-Corners region. The objective of this project is to compare different types of backwater habitats in their ability to function as nurseries for federally-endangered Colorado Pikeminnow and Razorback Sucker. Blake, Sasha Ewing, and Linden Jones worked on this project out of Farmington, NM during July-September, taking a total of six float trips down our 56-river mile study reach. I also tagged along for three float trips during July. These float trips always had much unplanned excitement, including dust storms, rattlesnakes, black bears, and flash floods. Blake and I were better prepared for the flash floods during the second year of this project however after completing swiftwater rescue training in Idaho Springs, CO, back in May. Blake is now working on getting ready for his master's defense.

Speaking of defenses, Alex King successfully defended her thesis on August 10th. Her two thesis chapters examined 1) long-term responses of Spring River fishes to decreasing metal concentrations and 2) distribution of and hybridization between introduced Blackspotted Topminnow and native Blackstripe Topminnow in the Spring River. We are happy to have Alex remain in the PSU Biology Department where she is now an adjunct lecturer teaching General Biology.

More local research in 2022 included completing our second year of stream fish sampling at Prairie State Park, MO and our first year of stream fish sampling in Elm Creek at Iola, KS. These are hopefully both the beginnings of what will become two long-term datasets.

During 2022 we attended the Kansas Natural Resources Conference in Manhattan, KS, the PSU Research Colloquium, and the Desert Fishes Council meeting in St. George, UT . We gave a variety of oral and poster presentations at these conferences. Lastly, I gave seminars to the Northeastern State Univ. Biology Department in Tahlequah, OK and the Missouri Master Naturalist Chert Glades Chapter in Joplin, MO.



The 2022 San Juan River crew pictured near the Four Corners. L to R: Linden Jones, James Whitney, Blake Hansen, and Sasha Ewing.

Dr. Brodsky's graduate level Human Dimensions course at the Overman Student Center.



In the spring I taught Ecology, Ichthyology, and Biometry, and during the fall I did Ecology, Environmental Life Sciences, and Fisheries Management. Both aquatics classes included a lot of exciting field trips, including a joint camping trip we did with the Kansas State University Ichthyology class during April 9-10, and the Fisheries Management class getting to help out with seasonal fish surveys conducted by the Kansas Department of Wildlife and Parks on Crawford State Lake on October 6th. Furthermore, during an Ichthyology field trip on April 23rd we found Northern Studfish in the Dry Branch, which was only the second time this species had ever been found in Kansas, and the first time since 1965!

During spring 2023 Blake Hansen will be defending his thesis, Josh Holloway will be starting his thesis under my advisement, and we have a marine biology field trip planned to South Padre Island, TX, so it looks like the fun times of 2022 will continue!



Above left: The Ichthyology class recording fishes in Shoal Creek at Schermerhorn Park in Galena, KS in April. (L to R): left to right: Alex King, Sydney Scoggins, Zach Garret, Maggie Saul, Kiowa Stark, and Josh Holloway. Above right: Blake Hansen holding a Longnose Gar captured from Lightning Creek during an Ichthyology class field trip. Below left (L to R): Neil Snow, Rachel Styers, Andrew George at Fall Graduation. Below right: Nature Reach's Day Camp kids looking at Monarch butterfly larvae.



Professional Activities (Students underlined; faculty in bold)

Masters Theses

- Emma Buckhardt. Amphibian occupancy and diversity on a post-mined landscape. Co-Advisors: Drs. Christine Brodksy and Andrew George.
- Mary Gathonj. Plant based polyphenols decrease cell migration and inhibit proliferation of human pancreatic cancer cells. Advisor: Dr. Phil Harries.
- Enrico Aveiro Johannsen. Use of *Wolbachia* to control the tick *Ixodes scapularis* by affecting fitness and sexual Mechanisms. Advisor: Dr. Peter Chung
- Alexandra King. Chemical and biological stressors threaten native fish diversity in the Spring River subbasin of Kansas. Master's thesis, Pittsburg State University, 63 pages. Advisor: Dr. James Whitney
- Rachels Styers. Documenting the rapidly expanding distribution of Ravenna grass (*Tripidium ravennae*) in eastern Kansas. Advisor: Dr. Neil Snow
- Siqi Wang. Effect of chimeric antigen receptor immunotherapy on cancer. Advisor: Dr. Peter Chung

Publications

- Buckardt, E.M., **C.C. Rega-Brodsky**, **A.D. George**. 2022. New Newts: Population Discovered in Crawford County, Kansas. *Collinsorum* 11:5–6.
- Daines, M., A. Anzjon, M. Gay, L. Headings, J. Huckabee, M. Marine, T. Poolman, S. Scoggins, R. Styers, I. Villafañe, **N. Snow**. 2022. Numerous distributional novelties collected by students for Idaho, Kansas, Missouri, Oklahoma, and Texas. *Journal of the Botanical Research Institute of Texas* 16: 551–557.
- George, A.D.**, Frank R. Thompson III, John Faaborg. 2022. Movements and habitat use by western ratsnakes (*Pantherophis obsoletus*) in a fragmented Midwestern landscape. *Herpetological Conservation and Biology* 17:306–315.
- Guenat, S., Purnell, P...**Rega-Brodsky, C. C.**, ...[+47 coauthors] & Dallimer, M. 2022. Meeting sustainable development goals via robotics and autonomous systems. *Nature Communications*, 13, 3559. <https://doi.org/10.1038/s41467-022-31150-5>
- Hammesfahr, A., **C.C. Rega-Brodsky**, K. Womack-Bulliner, and **J.E. Whitney**. 2022. Roost characteristics of a tricolored bat *Perimyotis subflavus* in the Missouri Ozarks. *Trans. Kansas Acad. Science* 125: 159–164.
- Hammesfahr, A., **C.C. Rega-Brodsky**, K. Womack-Bulliner, and **J.E. Whitney**. 2022. Optimizing surveys for imperiled bat species post white-nose syndrome. *Acta Chiropterologica* 24.
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- Webster, J.S., K.B. Gido, S.C. Hedden, D.L. Propst, and **J.E. Whitney**. 2022. Response of arid-land macroinvertebrate communities to extremes of drought, wildfire and monsoonal flooding. *River Research and Applications* 38: 832–845.
- Whitney, J.E., Z.R. Garrett, B.G. Hansen, J.A. Holloway, A.D. King, and K. Stark.** In press. The second collection of Northern Studfish (*Fundulus catenatus*) from Kansas. *Transactions of the Kansas Academy of Science*.

Oral presentations

- Buckardt, Emma M., Christine C. Rega-Brodsky, A.D. George. 2022. Landscape Composition Affects Anuran Occupancy Patterns on Mined Lands. 15th Annual Kansas Natural Resource Conference, Manhattan, KS and PSU Research Colloquium. **1st Place Winner (tied)**
- Buckardt, Emma M., Christine C. Rega-Brodsky, A.D. George. 2022. To Glow or Not to Glow: Effectiveness of Glow Sticks and Trap Method on the Capture Rates of Larval Amphibians. Kansas Herpetological Society 49th Annual Conference, Joplin, MO.
- George, A.D.** Gray Bats in Southeast, KS: Research and Monitoring. Kansas Bat Working Group, 15th Annual Kansas Natural Resource Conference, Manhattan, KS.
- George, A.D.** Life is Short but Snakes are Long: Novel Methods for Studying the Spatial Ecology of Ectotherms. Biology Department Seminar, Pittsburg State University.
- George, A.D., F. R. Thompson III, J. Faaborg.** 2022. Movements and Habitat Use by Western Ratsnakes (*Pantherophis obsoletus*) in a Fragmented Midwestern Landscape. Kansas Herpetological Society 49th Annual Conference, Joplin, MO.
- Hammesfahr, A., C.C. Rega-Brodsky, K. Womack-Bulliner, J. Whitney. Optimizing surveys for imperiled bat species post white-nose syndrome. WNS Surveillance Conference. Virtual.
- Hansen, B.G., J.E. Whitney, A.M. Bell, and M.G. Fishback. Backwater productivity assessment. Virtual presentation, San Juan River Basin Recovery Implementation Program Biology Committee Meeting.
- Hansen, B.G., J.E. Whitney, A.M. Bell, J.A. Holloway, M.G. Fishback, L.W. Jones, and S. Ewing. From bad to worse: poor backwater nursery quality declines further during the monsoon season in the San Juan River of NM, CO, and UT, which may impede imperiled fish recruitment. Desert Fishes Council Annual Meeting, St. George, UT.
- Headings, L., A.D. George, A., C.C. Rega-Brodsky. Evaluating the avian and vegetative communities on strip-mined land. PSU Research Colloquium. **1st Place Winner (tied)**
- Headings, L., A.D. George, C.C. Rega-Brodsky. Avian community composition and nest success on strip-mined land. Kansas Natural Resources Conference, Manhattan, KS.
- Headings, L., A.D. George, C.C. Rega-Brodsky. Evaluating the avian and vegetative communities on strip-mined land. Kansas Ornithological Society Annual Meeting, Atchison, KS.
- Jensen, W. E., W.A. Boyle, **A.D. George.** 2022. Developing a Motus Network to Study Grassland Bird Movements. Kansas Ornithological Society 73rd Annual Meeting, Atchison, KS.
- King, A.D. Cleansing our waters: how riffle fish communities in the Spring River of Kansas responded to pollution legislation and remediation. PSU Research Colloquium (**Best Virtual Graduate Student Presentation**) and Kansas Natural Resources Conference, Manhattan, KS.
- King, A.D., J.E. Whitney, A. Ghosh, and J.A. Holloway. Contemporary extent of the Blackspotted Topminnow invasion and frequency of hybridization with native Blackstripe Topminnow in the Spring River subbasin. Virtual presentation, PSU Research Colloquium.
- Nippoldt, S., H. Belgum, U. Utley, A. Dasgupta, A. Ghosh. Prevalence of ticks and tick-borne pathogens in mined land areas of southeast Kansas. PSU Research Colloquium. **2nd Place Award**
- Marine, M. C., A.D. George. The Effects of Thirty Years of Forest Management on Neotropical Migrant Songbirds. Kansas Ornithological Society 73rd Annual Meeting, Atchison, KS.



Thesis defenses and poster presentations. (Clockwise from top-left): Rachel Styers; James Jameson, Austin Abrams and Isabelle Villafañe; Jonathan Spickelmeir; Michael Daines; Danielle Evilsizor; Emma Buckardt, Bobbi Monroe, Paul Worsley.

Oral Presentations (continued)

- Price, H. B., **A.D. George**. Population Monitoring and Habitat Use of Gray Bats in Southeast Kansas. 15th Annual Kansas Natural Resource Conference, Manhattan, KS and PSU Research Colloquium.
- Reese, M., M. Dixon, M. Jirak, A. Tush, **A. Ghosh**. Prevalence and characterization of antibiotic resistant strains of *Enterococcus* spp. and *Acinetobacter* spp. in community household environment. ASM Microbe (Rapid Fire Oral presentation, virtual) and Arkansas INBRE, University of Arkansas, Fayetteville, AR.
- Rega-Brodsky, C. C.** Nearby nature: Studying urban mammals from the global to local scale. Keynote Presentation. Central Plains Society of Mammalogists Annual Meeting, Cedar creek, MO.
- Rega-Brodsky, C. C.**, K.C.B. Weiss, A.M. Green, F. Iannarilli, J. Tleimat, S. Fritts, D. Herrera, M.C. Fisher-Reid, J.A. Compton, D.J.R. Lafferty, M.L. Allen. Mammalian functional trait responses to anthropogenic and environmental factors across the contiguous USA. International Network of Urban Biodiversity and Design, Leipzig, Germany.
- Snow, N.** 2022. NSF-supported upgrades to the Sperry Herbarium, Pittsburg State University. BOTANY 2022 (virtual presentation).
- Whitney, J.E.**, Sewage, metals, and sediments as impediments to stream fish conservation in Kansas. Biology Department Seminar, Northeastern State University, Tahlequah, OK.
- Whitney, J.E.** Long-term change of fish communities in a polluted river basin: does cleaner water “act” on fishes? Presentation to the Missouri Master Naturalist Chert Glades Chapter, Joplin, MO.
- Whitney, J.E.**, B.G. Hansen, A.M Bell, and M.G. Fishback. Fish behavior and mortality during a monsoonal spate in the San Juan River, UT. Kansas Natural Resources Conference, Manhattan.
- Whitney, J.E.**, B.G. Hansen, A.M Bell, and M.G. Fishback. Fish behavior and mortality during a monsoonal spate in the San Juan River, UT. Desert Fishes Council Annual Meeting, St. George, UT.

Posters

- Abram, A., D. Benson, J. de la Peña, **C.C. Rega-Brodsky**. Range update for the nine-banded armadillo (*Dasypus novemcinctus*). Central Plains Society of Mammalogists Annual Meeting, Cedar creek, MO.
- Aikins, S., N.K. Sharma, **A. Ghosh**. Targeting PI3K pathway in prostate cancer cell line LNCaP. KINBRE Annual Symposium (iPoster presentation, virtual).
- Benson, D., J. de la Peña, **C.C. Rega-Brodsky**. Status of the Plains Spotted Skunk (*Spilogale interrupta*) in Kansas. Central Plains Society of Mammalogists Annual Meeting, Cedar creek, MO.
- Bolick, A., **D. Zurek**. 2022. Vector construction to generate charcoal rot resistant transgenic soybeans. K-INBRE Symposium.
- Buckardt, E. M., **C.C. Rega-Brodsky**, **A. George**. Landscape composition affects anuran occupancy patterns on mined lands. Capitol Graduate Research Summit, Topeka, KS.
- Caruthers, T., J. Hendy, **C.C. Rega-Brodsky**. Mammal community shifts during the COVID-19 shutdown: Three years of Snapshot USA data collection. Kansas Natural Resources Conference, Manhattan, KS.
- Daines, M. Distribution of *Astragalus amnis-amisii* (Fabaceae), a Plant Endemic to East-Central Idaho. PSU Research Colloquium.
- Evelsizer, D. Preliminary insights into the demography of Ozark Chinkapin in Roaring River State Park. PSU Research Colloquium and Missouri Botanical Symposium.
- Hansen, B.G., **J.E. Whitney**, A.M. Bell, and M.G. Fishback. Lack of high-quality nurseries is not just a human problem: nonnative fish densities in backwater nurseries of the San Juan River, NM, CO, UT. Kansas Natural Resources Conference, Manhattan, and PSU Research Colloquium.
- Holloway, J.A., **J.E. Whitney**, K.L. Boroughs, A.D. King. Assessing the morphological variability of Orangethroat Darters in an ecotonal riverscape. Kansas Nat. Resources Conference, Manhattan, KS.
- Jameson, W., K. Matlock, **P. Harries**. 2022. Gene expression of SARS-CoV-2 host cell mediators in human cancers. K-INBRE Symposium.

Posters (continued)

Loomis, J., C.C. Rega-Brodsky, A.D. George. Evaluation of AHDriFT camera trap system for long-term herpetofauna monitoring on reclaimed mined lands in southeast Kansas. Kansas Herp. Soc. Annual Meeting.

Michael, T., L. Headings, C.C. Rega-Brodsky, A. George. Ecological clines complicate identification of chorus frogs near range boundaries. PSU Research Colloquium.

Michael, T., L. Headings, C.C. Rega-Brodsky, A. George. Geographic variation complicates identification of chorus frogs near range boundaries. Kansas Natural Resources Conference, Manhattan, KS.

Monroe, B. H. Price, A. Paynter, A.D. George, A. Ghosh. Characterization of culturable bacterial isolates obtained from guano of gray bats in southeast Kansas. PSU Research Colloquium and Arkansas INBRE, University of Arkansas, Fayetteville, AR. **2nd Place Award**

Nippoldt, S., H. Belgum, U. Utley, A. Dasgupta, A. Ghosh. Prevalence of ticks and tick-borne pathogens in mined land areas of southeast Kansas. PSU Research Colloquium. **2nd Place Award**

Reese, M., M. Dixon, M. Jirak, A. Tush, A. Ghosh. Prevalence and characterization of antibiotic resistant strains of *Enterococcus* spp. and *Acinetobacter* spp. in community household environment.

Scholes, S. A., E.M. Buckardt, C.C. Rega-Brodsky, A.D. George. To infi-newt-y and beyond: An expanding eastern newt population in Southeast Kansas. Kansas Herpetological Society Annual Meeting, Joplin, MO.

Spickelmier, J., A.D. George. Missouri Ozark Forest Ecosystem Project (MOFEP): Using GIS to Map Bird Species Nests. PSU Research Colloquium.

Villafañe, I., A. Abram, J. Jameson, C.C. Rega-Brodsky. Demographics of consumptive and non-consumptive recreationists in Southeast Kansas. PSU Research Colloquium.

Worsley, P., J. Beach, T. Patel, S. Santra. 2022. New biodegradable polymer-derived precision nanomedicine for targeted drug delivery and treatment of prostate cancer. PSU Research Colloquium.

Worsley, P., S. Santra. 2022. Facile synthesis of biodegradable polymers for targeted drug delivery and treatment of cancer. K-INBRE Symposium.

Zerr, H., A.N. Angeles, E.M. Puddefoot, P. Chung. 2022. Western blot analysis of target genes in SV-40 transformed murine fibroblast cell lines. K-INBRE Symposium.

Below left: Madeline Gay at her new position with the US Fish and Wildlife Service at Lacreek National Wildlife Refuge, South Dakota. Center: Emma Buckhart (second from right) with her graduate committee (Drs. Christine Brodsky, Andrew George, and Catherine Hooey). Right: PSU alumna Dr. Hannah Thomas at her graduation from Cornell, now doing postdoctoral research at the John Innes Centre, Norfolk, England. Below bottom: The 2022 Ornithology class field trip to Nebraska.





Above (clockwise from above left): Danielle Evilsizor and Tabitha Caruthers at Roaring River State Park, Missouri, studying Ozark chinkapin; Mary Gathoni and Dr. Phil Harries at graduation; PSU participants in the annual Kansas Herpetological Society Meetings in Joplin; PSU participants in the 2022 Kansas Natural Resources Conference in Manhattan. Below (L): Ecology and Field Biology Orientation students and alumni Caitlyn Sanders and Marlene Spence visit the Monahan Outdoor Education Center for a field trip with the KDHE Surface Mining Unit. (R): Enjoying dinner outside at Welder Wildlife Foundation (near Sinton, Texas).





Clockwise from top left: Hallee Belgum identifying ticks in lab; Brayden Letterman carrying out a biofilm assay in Dr. Ghosh’s Microbial Physiology lab; Niamh Dixon (left) and Madison Reese presenting antibiotic resistance project at Arkansas INBRE conference at Fayetteville, Arkansas; Recruitment trip to Girard High School in March (L-R): Paul Worsley, Dr. Snow, Sam Eddington, Taylor Michael, Dr. Harries (not pictured, Dr. Ghosh); Winery visit with Dr. Ghosh’s Microbial Physiology class; Sydney Nippoldt presenting tick project at PSU Research Colloquium.