

# **BioNews 2021**

## Department of Biology Pittsburg State University



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Collared lizard (Crotaphytus collaris)

### From the Chair's Desk



#### **Dr. Bobby Winters**

Most of you are probably tired of reading introductions to newsletters wherein the writer proclaims that this has been a challenging year, so I will let the reader infer that from context. COVID has presented a challenge, but the Department of Biology has risen to meet that challenge. Faculty have re-engineered their classes and have learned new skills in a way that we can be proud of.

But enough of that.

There are challenges and changes beyond COVID. One of these is that there is a different

person writing this introduction. After many years as a valued faculty member and a number more as a talented and effective chair, Dr. Virginia Rider has opted to go on phased retirement. I've been given the opportunity to step in as Interim Chair until such time as a new chair can be hired.

One of the duties I've recently had to perform is accepting the retirement letter of Dr. James Dawson who has served the department as a plant physiologist for as long as anyone can remember. This will represent a significant change for the department. As a side note, his last graduate student, Nathan Elliot, is working on a Ph.D. at the University of Arkansas and it looks as if he will be working with algae.

In addition to the two changes in faculty listed above, Tish Potter, who had replaced Kelly Borden as departmental administrative specialist, has accepted the position as the Executive Associate of the Dean of the College of Technology.

Libby Graham, who is new to the PSU Campus, has taken the position of departmental administrative specialist (see next page).

In 2020, Christine Brodsky, Andy George, and James Whitney were promoted to the rank of associate professor.

Coming in to Biology is a journey of discovery for me. I find a vital, growing program in Ecology add Field Biology that is recognized throughout the region. Our pre-med and pre-health programs have a hard-won reputation for excellence, and are seeking to extend that reputation by revisiting its curriculum to insure its continued quality in to the future: "Just because we are good, doesn't mean we can't get better!"

Growth in the Ecology and Field Biology program means we have needs: We urgently need a new van for field work, and we need storage space for our equipment. Extending the excellence of our pre-med program will mean a lot of thought, discussion, and hard work, but is sure to bring great results.

Best wishes to all of you for the coming year.



#### Libby Graham

Libby joined our Department as Administrative Assistant during the Fall semester. She comes to us from having worked previously in higher education as a teacher at a college campus child care center in Kansas City. More recently, she came to PSU after being an administrative assistant and budget manager for the Kansas City, KS Public School District. Libby have a Master's in Organizational Leadership with a concentration in Human Resources Management and she loves to crochet.

We're delighted to have her in the Department!

Below (L, L-R): Derek Scholes (PSU alum now at StanTech), Haley Price, and Sara Scholes banding bats. A fantastic herpetological to Arkansas, posing here in the Ouachita Mountains (L-R): Austin Abram, Andrew George, Sara Scholes, Noa Maze, Dakota Herman, Talya Crouch, Max Bare, John Jameson, Kit Garvin, Gizelle Sisson, Luke Headings, Claire Campbell. (Photo by Emma Buckardt).





#### Dr. Christine Brodsky

We started off 2021 with a hopeful outlook and, luckily, the year was a positive and successful one. Fortunately, we met face-to-face for Urban Ecology and were back to our normal class sizes for our Fall courses, which was really great especially for getting to know our incoming Class of 2025. We were excited to have the largest Ecology & Field Biology Orientation class since I started teaching the course in 2017 with 33 students! I taught Animal Behavior for the third time this Fall, which was such a pleasure as we had students with a variety of career goals (Pre-Vet, Field Bio, Psych). I also taught Environmental Life Science for my 11<sup>th</sup> semester this Fall – it's crazy how time flies!

Our undergraduate student researchers continued to work with our faculty and graduate students in the field to collect data and present their findings in a variety

of venues. While most conferences were still held online, our students were able to present at the Kansas Natural Resources Conference, Undergraduate Research Day at the Capital, Pitt State's Research Colloquium, Kansas Ornithological Society Annual Meeting, and the Kansas Herpetological Society Annual Meeting, which we held on campus in November. Kudos to Gizelle Sisson, Taylor Michael, Caleb Durbin, and Maggie Murray for your field work and associated presentations!

Research continues full-speed in the Brodsky lab. Amy Hammesfahr (MS 2020) had one of her thesis chapters published in *Transactions of the Kansas Academy of Science*, with her remaining chapters in the works for submitting in 2022. I was also able to continue my international collaborations with UrBioNet and colleagues to yield a number of submitted and accepted publications, and two book chapters in the works for the *Routledge Handbook for Urban Biodiversity* and *New Perspectives in Ornithology* – coming soon!

We ran our third year of data collection for Snapshot USA – a program that has yielded an enormous amount of camera trap data nationwide. This year, I was lucky to have Jordan Hendy, Tabitha Caruthers, and Noah Sherwood spearhead data collection efforts. We observed 15 mammal species throughout Pittsburg. Caleb Durbin (Spring 2021 graduate) and I were coauthors on a 2021 publication of the initial Snapshot USA dataset in *Ecology*, with our second years' worth of data submitted to *Ecology* for a hopeful 2022 publication (Snapshot USA photo at right of a coyote from Wilderness Park).



For the second year, I have been lucky enough to serve as the Kansas Idea Network of Biomedical Research Excellence (K-INBRE) Campus Coordinator. In 2021/2022, the faculty and 15 students were funded approximately \$160,000 to conduct research. Additionally, all of our Spring 2021 K-INBRE graduates went off to either medical, PT, pharmacy, or graduate school. Kudos to our K-INBRE Scholars and graduates!

We have such excellent graduate students in the Biology Department! Dr. George and I continue to co-advise Emma Buckardt and Luke Headings for their Master's research on herpetofauna and bird communities on mined lands. Both Emma and Luke have presented their first years' worth of data from their thesis projects at multiple meetings, each winning presentation awards at the Kansas Herpetological Society and Pitt State Research Colloquium, respectively. Emma also found a population of Eastern Newts in Crawford Co., a state record, which has yielded two publications! I am looking forward to welcoming two new graduate students into my lab starting in January: Jenell de la Peña and Daniel Benson. Both Jenell and Daniel will be working on a statewide spotted skunk survey. If alumni would be interested in having a camera deployed on their land, please contact me (cbrodsky@pittstate.edu)!

Below left: Ashlyn Henderson sampling amphibians on mined land areas with a gray treefrog. Right (L-R): Tabitha Caruthers, Noah Sherwood, Ned Curfman, and Jordan Hendy deploying Snapshot USA camera traps in Wilderness Park, just north of Pittsburg.



Below (L-R): Becca Snow cutting herbarium labels; Wildlife Club campfire at the Natural History Reserve; Annika Anzjon helping assemble a Modus radio telemetry tower.





#### Dr. James Dawson (1979 [left] and 2019)

As I reflect on nearly 50 years in the academic world a number of points remain etched in my memory. The year 1974 was a turning point year for me. In that year I completed the Medical Mycology course offered by the University of Kentucky Medical school (Dept of Community Medicine) and had two of my photographs exhibited at Field Museum of Natural History, as part of the 28<sup>th</sup> Chicago International Exhibition of Nature Photography. I was also elected to Sigma Xi, the International Research Honorary.

My arrival on the PSU campus occurred in the fall of 1978, having graduated a year earlier from the University of Kentucky and completing one year on the faculty there. Over 43 years I had many opportunities in many areas both on our campus and in a wider arena.

On our campus I am most proud of four accomplishments:

- The BGS program. When Dr. Brill appointed me director there had been two graduates in the previous five years. At the end of my short tenure I had been able to graduate nearly 300 students.
- The Public Health minor. I was one of the three founding members, with Drs. Winters and Schiefelbein, of this popular minor.
- The Partner's Program, with KCUMB. This program admitted our junior premeds to Medical School. At the end of their first year we graduated them with a BS in Biology.
- Being involved in the planning and presentation of a five-summer (1985-1989) NSF institutes, with Benedictine University, to bring high school biology teachers up to date.

Locally, I am most proud of two recognitions. One was from the Kansas Junior Academy of Science recognizing many years of service as a science fair judge, at the district level. The other was being elected to the Oklahoma State Science and Engineering Fair Hall of Fame for many years of service as a science fair judge.

Nationally, I am most proud of:

- Being able to assist two states, Kentucky and Arizona, with their concerns relative to fungi.
- Being called upon by 4 federal governmental departments to conduct funded research or act as a consultant in my area of expertise.
- Conducting multi-year supported research on algae, as part of their Center for Applied Energy Research, CAER, at the University of Kentucky.
- Assisting the University of Texas at Austin, Collection of Algae (UTEX), in the development and presentation of more than 20 workshops on growing algae commercially.
- Being a panel member on a panel for congressional aides in Washington DC set up by the World Wildlife Fund.

Internationally, I conducted funded research projects for 2 multinational corporations and served as a consultant to 2 foreign governments.

All this was done while teaching full time. During all those years I was first and foremost a teacher and hope to be remembered as that. My list might be seen as self serving, and to an extent it is. But none of this would have happen if I had just stuck to my ' job description'. I encourage you all to grasp opportunities as they come your way. An unforeseen opportunity my change your life and the lives of countless others.

Finally to all my former students, staff and other faculty: THANKS FOR THE MEMORIES.



#### Dr. Andrew George

Hello, Everyone! The herpetology class traveled to southwest Arkansas in April to study the region's unique herpetofauna. We visited remote locations in the Ouachita Mts over 4 days to observe endemic salamanders and other unique species. Each evening was spent visiting around a campfire. The students appreciated being able to travel together after similar trips were cancelled in 2020. The Ouachita herpetology trip has become one of the most memorable experiences for our field biology students during their time at PSU.

Research activities have continued unabated in 2021. In fact, this year has perhaps been the busiest yet. The Missouri Ozark Forest Ecosystem Project (MOFEP), now in its 30<sup>th</sup> year, is a renowned example of applied forestry research. Grad student Mary (Whiteacre) Marine is working closely with collaborators from several universities and agencies to study the long-term effects of

forest management on bird communities. Mary spent her first field season monitoring bird abundance and reproductive success in landscape-scale management units in the Ozarks. Work will continue through 2022.

Grad student Haley Price continued her project to study and protect Kansas's only colony of the federally endangered gray bat. Haley and her assistants are using a variety of techniques, including acoustic detectors, insect light traps, and infrared cameras. In late summer we captured and banded more than 600 bats. The data are being used to study population dynamics and habitat use. Dr. Brodsky and I are co-advising two additional grad students who are studying habitat relationships and the conservation value of mined lands. Luke Headings is focusing on bird abundance, community structure, and reproductive success. Emma Buckardt is studying amphibian occupancy patterns and box turtle population structure. The project, now in its second year, is already yielding interesting discoveries. Emma documented a new population of eastern newts just west of Pittsburg. Her findings were published in *Herpetological Review* and *Collinsorum*.

In early November the Biology department hosted the 48<sup>th</sup> annual meeting of the Kansas Herpetological Society (photos, next page). The meeting was one of the first in-person academic conferences since before the pandemic. Despite many uncertainties, the meeting was an absolute success. We had record attendance, including students and faculty from all KBOR institutions and at least nine other states. The keynote speaker



was distinguished author and herpetologist Dr. Whit Gibbons from the University of Georgia. PSU undergrads Gizelle Sisson and Taylor Michael presented posters and grad student Emma Buckardt presented a talk. Emma won the prestigious George Toland Award for Ecological Research on North American Herpetofauna! Special thanks to grad students Mary Marine, Luke Headings, and the many other people who helped make the meeting a success.

Photo (L-R): Herpetology students taking a shortcut across the Little Missouri River while searching for endemic salamanders in southwest AR (L-R): Claire Campbell, Dakota Herman, Austin Abram, Gizelle Sisson, Noa Maze, Talya Crouch.

Last but not least, I recently began collaborating with biologists from several institutions to install Motus stations in Kansas. Motus is an international network of radio towers used to study long-distance movement patterns of birds and other migrating animals. In June, PSU students Annika Anzjon and Luke Headings worked with scientists from Bird Conservancy of the Rockies to install a Motus station near Greenbush. We hope to expand the network and begin attaching transmitters to animals in 2022.

#### Highlights from the Kansas Herpetological Society Meetings in November



<u>Top</u> (L): Emma Buckardt was awarded the George Toland Award for Ecological Research on North American Herpetofauna; (R): Isabelle Villafane, Madeline Gay, Belle Pfeifer, and Khloey Stringer. <u>Center</u>: Gizelle Sisson (L) and Taylor Michael with their posters. <u>Bottom</u>: L: Luke Headings, Emma Buckhardt and Marine Marine as Emcees on the wildly popular Trivia Night; R: *Geranium viscosisimum*, a widespread wildflower ranging throughout much of the Rocky Mountains.



tools will be of great value.

#### Dr. Anu Ghosh

This is another COVID stricken year but due to the availability of vaccines, this school year was much better than 2020. Our students realize and appreciate the value of face-to-face classes. Although the option of remote-learning is available, the personal touch between students and faculties is the key to success.

This year, in addition to the regular courses, I prepared and taught a new course Principles of Biology I. Many thanks to Dr. Phil Harries and Dr. Dan Zurek, the other instructors of this course, for their unconditional support. I thoroughly enjoyed interacting with the incoming freshmen in lecture and laboratory. Another course that I have taught in past and has been legislated this year is "BIOL 552: Introduction to Bioinformatics". This course is offered as an upper-level elective to undergrads and graduate students. With the vast expansion of genomic sequence data, this topic has been increasingly recognized as a core to biology curriculum by many other institutes; therefore introducing and training our students with various analysis

With help of Ms. Delia Lister and Dr. Heather Wallace (DVM), I was able to put together an **internship program in "Pre-Veterinary Medicine"**. This is offered every semester including summer. Our undergrads with pre-vet emphasis will get valuable experience out of this program via Broadway Animal Hospital in Pittsburg. We are looking up to animal lovers who are willing to fund some scholarships for our pre-vet students.

My Masters student Ms. Adara Wolfe defended her research project report on "A pilot study on detection of lead in residential garden soils in tri-state mining area" in May this year. She did an excellent job as a teaching assistant for Environmental Life Science labs for the past two years. A new graduate student on board this year is Ms. Bobbi Monroe who is a teaching assistant for General Biology labs and will be involved in metagenomics studies for her thesis project. The thesis submitted by my previous Masters student Ms. Leah Cuthill "A study on ecological distribution of and selected gene expression in *Amblyomma americanum*: an insight into the alpha-galactose allergy caused by tick bites" (August 2018 - July 2020) received the **Distinguished Thesis Award** in the Arts and Sciences category.

I am grateful to have several motivated undergraduate researchers working in the field as well as in my laboratory this year. Ms. Sydney Nippoldt, Ms. Hallee Belgum, Ms. Cassady Utley working on the tickpathogen project; Ms. Sara Goins, who graduated this December, worked on mosquito-West Nile Virus project; Ms. Madison Reese and Ms. Niamh Dixon looking into the spread of antibiotic resistant microbes in community households. These projects should lead to a few meaningful publications in near future.

Also, on behalf of our departmental scholarship committee, I would like to reach out to all our alumni and well-wishers for recruitment of outstanding incoming freshmen. Any support in terms of scholarship is highly appreciated. Please feel free to contact me (<u>aghosh@pittstate.edu</u>) or our Chair (<u>bwinters@pittstate.edu</u>) if you need any information.

Happy phase retirement to Dr. Virginia Rider whose contribution to our pre-med program cannot be described in words. She served the Biology departmental as the chairperson during a difficult and challenging time. Kudos to her relentless support and positivity throughout her administrative role. I am grateful to know her as an educator, researcher, and administrator. She is still very much among us and will always be.

As we all know by now that the COVID virus will become an endemic just like the flu virus, so my hope is that everyone gets vaccinated and embrace a healthier and happier 2022.



#### **Dr. Phillip Harries**

Greetings from Heckert-Wells. It's been another busy year! In the classroom I've been continuing to teach Principles of Biology I, Introduction to Research, Biology of Cancer, Bioethics, Virology, and Pre-Health Orientation I. After two semesters of hybrid courses and reduced classroom capacity due to Covid concerns, it has been exciting to move back to more face-to-face interactions. I really had some fantastic groups of students in the classroom this year and was surprised and honored to receive one of PSU's outstanding faculty awards.

A high point this year was the successful defense and graduation of grad student, Devapriya Segaran. Her project examined the ability of several plant-based polyphenols to kill lung cancer cells and mitigate their metastatic potential. Despite the fact that Priya's research was put on hold for the better part of a year due to Covid lockdown, once the campus reopened, she really threw herself into her work and was able to obtain a large amount

of quality data in a relatively short period of time. It was wonderful to see her effort pay off. Priya is now employed by a Biotech company in the Boston area where she continues to work with cancer cells.

Priya's project has been picked up by another graduate student, Mary Gathoni, who comes to Biology from a nursing background. Mary will be looking at the effect of the same polyphenols on both pancreatic cancer cells and healthy cells. She has been working with Dr. Chung to learn cell culture technique and is ready to begin collecting data.

Speaking of graduate students, Dr. Anu Ghosh and I are continuing in our role as the department's graduate coordinators (this primarily involves facilitating the screening of applications). If you know anyone considering a graduate degree in biology please encourage them to get in touch with Dr. Ghosh or myself.

In addition to the graduate research, I've had several undergrads who have been looking at the expression of genes involved with SARS Cov-2 infections. In particular, they have been looking for overexpressed genes that may make specific cancer cells more susceptible to Covid infection. These students will present at the statewide K-INBRE conference in January.

L: Rachael Styers in the shade after traipsing through prairies. R: Dr. Harries and Devapriy at her graduation.





#### Delia Lister

Hi everyone! Well, 2021, while better than 2020, has still been filled with changes, new challenges, and opportunities. I have been continuing to make updates to all my classes, and those updates have been well received by students. I am so proud of the work my student staff has done to continue to improve the quality of life and welfare of all our animal ambassadors. While my program schedule has been a bit lighter this year thanks to the continuing pandemic, I have certainly filled that "extra" time with many projects that have needed attention for many years.

Summer 2021 was ! I taught Summer ELS for our traditional PSU students, but also added an online version for the PSU in Paraguay students. I would love to have been teaching in Paraguay, but of course, the pandemic prevented international travel. We were able to complete a major renovation and addition to our raptor enclosures. Evergy energy company really stepped up and not only

provided additional funds, but much needed skilled labor to help create fantastic homes for our raptor ambassadors. Many thanks to the Sperry-Galligar Audubon Society, my student staff, Dr. Hermann Nonnenmacher, and retired professors emeritus, Drs. Steve and Cindy Ford for volunteering their time. Thanks for the Dean's office for providing additional funds to help cover the increase prices in construction materials. Summer camps were back in person and a wonderful time was had by all, and I'm looking forward to adding a middle school camp to summer 2022. The other highlight of the summer was adding a new raptor ambassador, "Osage" the barred owl. He is an imprint who joined us from Milford Nature Center in Junction City, KS. He has taught me so much about training a new raptor ambassador!



Left: Delia with Osage. Right: Camp kids observing macroinvertebrates in the water..

I will continue to be President-elect 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. As usual, I am always on the hunt for grants and outside funding to keep Nature Reach going. I hope you will consider donating to the program. For more information you can always visit our website: <u>www.pittstate.edu/naturereach</u>. This program wouldn't have existed for the past 37 years without the generosity of donors!

#### Miscellaneous research activities in the field, lab, and fieldtrips



Clockwise from top left: Sydney Nippoldt and Cassady Utley setting up dry ice traps for collecting ticks; the MOFEP (Missouri Forest Ecosystem Project) field team [Clockwise from top left: Mary Marine, Janet Speer, Dr. Paul Porneluzzi, Ryan Andrews, Sierra Mosely, Melissa Stone); Sara Goins isolating DNA of ticks; KS Herpe-tological Society field trip near the Saline north of Hays (L-R): Taylor Michael, Tabitha Caruthers, Talya



Crouch, and Khloey Stringer collecting amphibian and reptiles.

Left: Welcoming the newest cohort of field biology students in Ecology and Field Biology Orientation for the Fall 2021 semester.



#### Dr. Virginia Rider

Greetings to Friends of the Biology Department,

It has been an exciting year for me. In June, I stepped down as Department Chair and began phased retirement in the fall semester. I am teaching Human Physiology as my primary responsibility, which I still love doing. I will be in phased retirement for two years, or three more semesters. The Department will no doubt search for a replacement in the coming year. The most enjoyable part of being at PittState has been the multitude of wonderful students I have watched go through our program and continue into professional programs.

Many of you are

health care providers for the Four State region and beyond. I hear nothing but positive remarks about our graduates. I cannot say enough about each one of you. I have had the pleasure of seeing many of you this past year in a variety of circumstances. I am struck by your competence, kindness and contributions to humanity. Thank you all for sharing a bit of your life with me. You have truly been a most fulfilling pleasure of my life. What now? Jim and I plan to stay in Pittsburg. This is our home, and we have no desire to relocate to a different place on retirement. I plan to fully pursue my riding passion as long as I am able. Perhaps some travel, music and learn a new language? There are



so many things to do, and I plan to enjoy every day to the fullest for the next years. The years pass quickly, and I am struck that it is time for me to retire. Somehow it never occurred to me that I would retire. Buthere we are. This is the time of year when we remember family, friends and those who have touched our lives. I am most fortunate to have been chosen to spend the last 22 years at PittState. May peace and joy be part of your lives forever.



#### **Dr. Neal Schmidt**

I hope our newsletter finds you well! The Anatomy and Physiology, Human Anatomy, and Pathophysiology grades were completed and submitted before any reminder emails could be sent out to me! These courses are intended to provide a beneficial educational experience for our majors in the pre-health and biological sciences.

Congratulations to all my advisees and other students that have moved on to professional school, graduate school, or the workplace. Thanks to my students and assistants for their solid efforts in

my courses over the last year. Special thanks to Enrico and Mack for teaching the Anatomy and Physiology labs. As always, I am grateful for the opportunities to work with our students and appreciate the support I



**Above** (L-R): Madeline Gay holding a longnose gar; Boston Norton at summer camp; Clair Campbell holding a speckled kingsnake. **Below** (clockwise from top): Ecology and Field Biology Orientation students and alumna Caitlyn Sanders (far right) visit Mined Land Wildlife Area #2 for a field trip with the KDHE Surface Mining Unit; Taxonomy of Vascular Plants students with teaching specimens; Dr. Nonnenmacher attending to (bird, not visible) Reno at Natural History Reserve; Madison (L) and Niamh testing on antibiotic resistance microbes.





#### **Dr. Neil Snow**

We welcomed three new graduate students in the Sperry Herbarium this year. Danielle Evilsizor (BS, Missouri State Univ.) is studying Ozark chinkapin (*Castanea orzarkensis*) in Roaring River State Park in Missouri, a species badly afflicted with blight. Her first field season located many more trees than expected. Michael Daines (BS, Brigham Young Univ.-Rexburg) is doing plant survey work (floristics) on the Caribou National Forest in southeastern Idaho. Rachel Styers (BS, Pittsburg State Univ.) is working on her thesis proposal.

Efforts in the herbarium continued to focus on curation of backlogged material. Given delays due to covid, the NSF grant was extended a year. Over 3000 speci-

mens were newly mounted (many with new labels), including some backlog from the early 1990s. During Fall semester, thanks to splendid work from Taylor Michael, Sara Scholes and Tabitha Caruthers, over 2600 specimens were mounted, and over 4000 were filed into the main collections. Thanks also to Maddie Gay for her help all year, including updates of database entries. Danielle Evilsizor databased about 1800 specimens, helped resolve missing or confusing label data, and sorted and filed bryophyte specimens. In the Spring we had assistance from Ashlyn Henderson, Paige Claasen, Daniel Munguía and Robbyn Gill. Our daughters Becca and Jessi contributed to mounting and databasing. Thanks to Blake Hansen for helping to move some heavier materials. Approximate tallies at this writing (mid-December) include 45,000 specimens databased, including virtually all of the vascular plants. Progress on bryophytes is slower but far ahead of previous years.

Herbarium personnel for Fall 2022 (L-R): Danielle Evilsizor, Sara Scholes, Tabitha Caruthers, Neil Snow, Madeline Gay, Rachel Styers, Taylor Michael, and Michael Daines. (Photo by Sarah Daines.)



A highlight this year was the discoveries in the Grass and Plant taxonomy courses of a dozen or so new state or (mostly) county distribution records. Students are making discoveries practically in their own back yards. I accompanied to the field my graduate students Danielle at Roaring River State Park in Missouri, Rachel at Prairie State Park (also in Missouri), and Michael in southeastern Idaho.

I enjoyed drop-by visits from Maggie Murray (PSU; 2021) and Griff Hoffman (PSU; 2020). Maggie is working for StanTech and Griff for EPA Region 7, both in the KC metro area. Both are happy and thriving in their positions. Griff (see photo, next page) relayed how his fully satisfied he was with his studies in our department.

An ongoing pleasure is being coordinator for the departmental seminar series. The calendar year included seventeen presentations, including two MS defense seminars, with speakers (a few on Zoom) from Kansas, Missouri, Arkansas, California, Washington and New York. A recent speaker was Hannah Thomas (BS, PSU 2017), now finishing her doctorate at Cornell.

Below (L): Hannah Thomas giving a departmental seminar. Students (L-R) Sara Scholes, Tabitha Caruthers and Taylor Michael efficiently mounting plants in our newer facilities, Hartman 212.



On the research side, I submitted with one or more colleagues a new species of grass from Mexico, am revising an accepted paper on nomenclature and type specimens of *Eugenia* from New Caledonia, and finishing the final edits of a monograph of the grass genus *Leptochloa*. I am participating in the Poaceae (grass) part of the PAFTOL (Plant and Fungal Trees of Life) project headquartered at the Royal Botanical Gardens, Kew, in the UK. Although covid again put the damper on most conferences, I attended the Kansas Herpetological Society meetings, led so ably by Dr. George and several departmental graduate students.

Outside of PSU, I enjoy nearly daily hikes in the summer on the trail system in Helena with my wife and our goofy and energetic Labrador. A much-overdue visit to my hometown of Seattle in June to visit friends from high school was enjoyable. Nice also to hear the Seattle Symphony, of which my late father was a member for about a decade. Trips to visit my mother in Tucson and my father's widow in Kalispell also were welcomed getaways. Personal musical highlights were performing Vivaldi's Four Seasons under Dr. Munguía and the other musicians in April; attending the Walnut Valley Festival in September with our daughter and catching up with Edith Sigler (BS PSU, 2021; now in medical school at Wichita State) and her mother, Dr. Kimra Ross; and hearing some western swing band with Becca in Kansas City and Miami, OK.

We'll miss Dr. Dawson after he retires this year. He has been an important part of the Department of Biology for many years and influenced many students.

Congratulations also to all of our graduates: Stay in touch and send your Alumni news to me for next year.

Finally: Stay safe and keep enjoying the wonders of the natural world.



Left: Plant Taxonomy field trip in late October to Mined Land Area No. 25.

Right: A selfie with Griff Hoffman (right) during his drop-by visit earlier in the semester.



#### **Dr. James Whitney**

In terms of the Four-States area, for Alex King's thesis research we did a lot of fish sampling throughout the Spring River of southeastern Kansas. The goals of this sampling were twofold: 1) quantify riffle fish communities across 10 locations distributed from the Missouri to Oklahoma borders and 2) collect genetic samples from Blackspotted and Blackstripe Topminnow to document the distribution for each species and investigate hybridization between them. Alex is interested in quantifying contemporary riffle fish communities in the Spring River so that she can compare them to communities from the 1990s and 1960s to investigate how fishes have responded to longterm decreases in metal concentrations (i.e., cadmium, lead and zinc) in the Spring River. Historically, water quality in the Spring River was impaired by metal pollution originating from the Tri-State Mining District, but during the last 20 years, water quality has greatly improved in this system. This project is funded by the US Fish and Wildlife Service and Kansas Department of Wildlife and Parks. For Alex's second research project, we are using genetic

techniques to document the distributions of Blackspotted and Blackstripe Topminnow in the Spring River, which are species that are notoriously hard to identify and distinguish based on visual cues alone. This work is of importance because the Blackspotted Topminnow was introduced to the Spring River system during the

1990s, but based on previously-collected data, it appeared that the upstream spread of this nonnative species was restricted by Empire Lake near Riverton, KS. We collected genetic samples from numerous locations above and below Empire Lake to determine if this reservoir is functioning as a dispersal barrier to Blackspotted Topminnow, and to identify hybridization zones between this nonnative and the native Blackstripe Topminnow. This project was funded by Pittsburg State University. Dr. Anu Ghosh has been vital in helping us figure out how to do the genetic analyses for this project, and none of the Spring River sampling could have been completed without the assistance of Josh Holloway. Alex will be defending her thesis during the sum-



mer of 2022, so some conclusions from these projects will be coming soon!

Josh Hollowell (L) and Blake Hansen (R) surveying samples from Blake's San Juan River research.

In the Four-Corners region, Blake Hansen began his thesis research on the San Juan River during 2021. The objective of this project is to compare different types of backwater habitats in their ability to function as nurseries for young-of-year Colorado Pikeminnow and Razorback Sucker, which are both federallyendangered species. This research is critically important for the San Juan River system, which experiences next to zero natural recruitment of these two species, such that hatchery stocking is the only thing keeping them in the river. This project is funded by the U.S. Fish and Wildlife Service and is part of the San Juan River Basin Recovery Implementation Program. Blake and I headed out to the San Juan region in early July, where we met up with the two technicians who we hired to work on this project, including Amber Bell from Utah and Michaela Fishback from Oregon. During July we completed three float trips down our 55-mile study reach of the San Juan River between Shiprock, NM and Montezuma Creek, UT. In this reach we identified 20 sample sites where we deployed data loggers and collected information on a variety of biological, chemical, and physical variables we believed were important in influencing the survival of juvenile native fishes.



L: Blake Hansen and Amber Bell rafting down the muddy San Juan River in New Mexico. R: Stream Ecology students measuring fish during a class field trip to Turkey Creek (L-R): John Jameson, Kit Garvin, Paige Claassen, Claire Campbell, Sydney Scoggins, Maddie Gay, Abraxas McMahan, Alex King, and James Leeper.

These floating/camping trips took anywhere from 3-6 days, depending on how much data we had to collect. We completed these trips on a pair of 16 x 8 feet rafts that we purchased using grant funds. These trips always seem to include a bunch of unexpected excitement, including dust storms (i.e., haboobs) strong enough to blow away Amber's tent; strong monsoonal thunderstorms that drenched us with rain, bombarded us with lightning strikes, and flooded our campsites; black bears who would cross the river directly in front of our rafts; and mud deep enough in some of our study sites to come up to our waists. These conditions made for some challenging trips, but despite all this, we always had a lot of fun. When we weren't on the river we stayed at an Airbnb in Farmington, NM, which was always a welcome respite from the extremes of the San Juan wilderness. I left the San Juan to head back to Pittsburg in late July, but Blake, Amber, and Michaela continued researching out there and completed four more data collection float trips until they finished in late September. Blake will be doing this all over again during the summer of 2022 to obtain a second year of data before he defends his thesis in spring 2023.



L-R: Dr. Whitney holding a Razorback Sucker from the San Juan River; Blake Hansen holding a Colorado Pikeminnow from the San Juan River; Maddie Gay holding a Flathead catfish.



Left: The 2021 San Juan crew pictured at the Farmington, NM Airbnb (L-R): Blake Hansen, Michaela Fishback, James Whitney, and Amber Bell. Right: Josh Holloway and Alex King crossing the Spring River.

In terms of teaching, 2021 was a pretty quiet year regarding conference attendance, since nearly all conferences were virtual as a result of the pandemic. Alex King presented some of her research on the Blackspotted Topminnow invasion of the Spring River at the Pittsburg State University Research Colloquium during April 2021, where she received an award for her presentation. Further, during November 2021 Michaela Fishback presented a poster describing spatiotemporal variation in the abundances of nonnative Virile Crayfish in the San Juan River at the virtual Desert Fishes Council meeting. Lastly, I attended the annual Kansas Herpetological Society meeting, which was held in-person at Pittsburg State University during November 5-7<sup>th</sup>. This was my first herpetology meeting, and I'm glad I went because I had a great time and learned a lot!



Left: Michael Daines collecting *Ivesia gordonii* (Rosaceae) in the Portneuf Range, ESE of Pocatello in Idaho. Right: Biology students temporarily trans-mutating into other-worldly apparitions on Halloween (L-R): Dakota Herman, John Jameson, Sara Scholes, and Austin Abrams.

#### Publications (Students underlined; faculty in bold)

- Boroughs, K.L., J.E. Whitney, R.A. Hrabik, J.A. Holloway, <u>A.N. Clemens</u>, <u>A.D. King</u>, and A.D. Thompson. 2021. Freckled Madtom (*Noturus nocturnus*) discovered in the Spring River subbasin of Kansas. *Transactions of the Kansas Academy of Science* 124: 199-202.
- Buckardt, E. M., Rega-Brodsky, C. C., & George, A. D. 2021. Notophthalmus viridescens (Eastern Newt). Herpetological Review 53: 571.
- Buckardt, Emma M., Christine C. Rega-Brodsky, Andrew D. George. 2021. New Newts: Population Found in Crawford County, Kansas. *Collinsorum (in press)*.
- Cove, M.V., Kays, R., Bontrager, H., Bresnan, C., Frerichs, T., Klann, R., Lee, T.E., ... Rega-Brodsky, C.C., <u>Durbin</u>, <u>C.</u>, ... & McShea, W.J. 2021. SNAPSHOT USA: The first coordinated national camera trap survey of the United States – Data from 2019. *Ecology*, e03353.
- Goddard, M.A., Davies, Z.G., Guenat, S., Ferguson, M.J., Fisher, J.C., Akanni, A., Ahjokoski, T., ...**Rega-Brodsky, C.C.**, ...& Dallimer, M. 2021. A global horizon scan of the future impacts of robotics and autonomous systems on urban ecosystems. *Nature Ecology & Evolution* 5: 219-230.
- Ghosh A., Zhu E., Wang H., Zurek L. and Zhu J. 2021. Antibacterial activities of nepetalactones against public health-related pathogens. *Natural Product Communications* 16: 1-5.
- Olson E., Grenda T, **Ghosh A.** and Ricke S. C. In press. Microbial Pathogen Contamination of Animal Feed. *In* Present Knowledge in Food Safety – A Risk-Based Approach Throughout the Food Chain. Eds: M. Knowles, L. Anelich, A. Boobis, B. Popping; Elsevier ISBN: 9780128194706 (Academic Press)
- <u>Hammesfahr, A</u>., **Rega-Brodsky, C. C.**, Womack-Bulliner, K., & **Whitney, J.** 2021. Public misunderstanding of bats does not preclude positive attitudes towards bats in Missouri. *Transactions of the Kansas Academy of Science* 124: 203-215.
- <u>King, A.D.</u>, **J.E. Whitney,** J.A. Holloway, and <u>K.L. Boroughs</u>. 2021. Lost from Oz? Status of the Sunflower State's Ozarkian fish fauna. *Transactions of the Kansas Academy of Science* 124: 45-57.
- <u>King, A.D.</u>, **J.E. Whitney**, J.A. Holloway, and <u>K.L. Boroughs</u>. 2021. A black spot on our record: Invasion history of the nonnative Blackspotted Topminnow (*Fundulus olivaceus*) in the Spring River subbasin of Kansas, with a comparison to long-term trends in prevalence of Blackstripe Topminnow (*Fundulus notatus*). *Transactions of the Kansas Academy of Science* 124: 216-226.
- Knapp, S., Aronson, M.F.J., Carpenter, E., Herrera-Montes, A., Jung, K., Kotze, D.J., La Sorte, F.A., Lepczyk,
  C.A., MacGregor-Fors, I., MacIvor, J.S., Moretti, M., Nilon, C.H., Piana, M.R., Rega-Brodsky, C.C., Salisbury,
  A., Threlfall, C.G., Trisos, C., Williams, N.S.G., & Hahs, A.K. 2021. A research agenda for urban ecology under global biodiversity loss. *BioScience* 71: 268-279.
- **Snow, N**., J. Munzinger, M.W. Callmander. Accepted (in revision). Additional taxonomic and nomenclatural notes on New Caledonian *Eugenia* L. (Myrtaceae). *Candollea*
- Snow, N., P.M. Peterson. In review. A new and evidently rare new species of *Dinebra* (Poaceae: Chloridoideae: Cynodonteae) from Sonora, Mexico. *Systematic Botany*

Whitney, J.E., J.A. Holloway, J.T. Wright, K.L. Boroughs, R.E. Goodreau, A.L. McManis, A.B. Pistorius, D.K. Puritty, M.A. Ramirez, and R.A. Styers. 2021. Assessing the invasion history and contemporary diet of nonnative redear sunfish (*Lepomis microlophus* Günther, 1859) in an ecotonal riverscape. Aquatic Invasions 16: 527-541.

#### **Oral presentation (Students underlined; faculty in bold)**

- Buckardt, E. M., Rega-Brodsky, C. C., & George, A. 2021. Herpetofauna Communities on Mined Lands in Southeast Kansas. Pittsburg State University Research Colloquium, Virtual.
- Buckardt, E. M., **Rega-Brodsky, C. C**., & **George, A**. 2021. Anuran Occupancy Patterns on Mined Lands. Kansas Herpetological Society Annual Meeting, Pittsburg, KS.
- Buckardt, Emma M., Christine C. Rega-Brodsky, Andrew D. George. 2021. Anuran Occupancy patterns on mined lands. Midwest Partners in Amphibian and Reptile Conservation (PARC). *virtual*
- Buckardt, E. M., **Rega-Brodsky, C. C**., & **George, A**. 2021. Searching for amphibians in need of conservation on mined lands. Midwest Partners in Amphibian and Reptile Conservation Annual Meeting, Virtual.
- <u>Gay, M</u>. & **Rega-Brodsky, C. C**. 2021. Trends in soil chemistry and O-horizon depths across an urbanization gradient. Pittsburg State University Research Colloquium, Virtual.
- **George, Andrew D**. 2021. Bird conservation in managed forests: insights from a 100-year ecological experiment. Invited seminar, Northeastern State University, Tahlequah, OK *oral presentation*
- <u>Headings, L</u>., **George, A**., **Rega-Brodsky, C. C**. 2021. Evaluating the avian and vegetative communities of Mined Land Wildlife Areas in Cherokee and Crawford counties. Pittsburg State University Research Colloquium, Virtual.
- <u>Headings, L</u>., **George, A**., **Rega-Brodsky, C. C**. 2021. Evaluating the avian and vegetative communities on strip mined land: Year one update. Kansas Ornithological Society Annual Meeting, Virtual.
- <u>Price, Haley</u>, **Andrew D. George**. 2021. Population monitoring and habitat use of gray bats in southeast Kansas. Kansas Natural Resource Conference, *virtual*
- Price, Haley, Andrew D. George. 2021. Gray bats in southeast Kansas: Population monitoring and habitat use. Midwest Bat Working Group Conference, *virtual*

#### Posters (Students underlined; faculty in bold)

- Buckardt, E. M., Rega-Brodsky, C. C., & George, A. (Jan 2021) Herpetofauna Communities on Mined Lands in Southeast Kansas. Kansas Natural Resources Conference, Virtual.
- <u>Durbin, C.</u>, <u>Whiteacre, M.</u>, & **Rega-Brodsky, C. C**. (Apr 2021) Mammal communities in Kansas mined lands: Second year of Snapshot USA data collection. Pittsburg State University Research Colloquium, Virtual.
- Durbin, C., Whiteacre, M., & **Rega-Brodsky, C. C**. (Jan 2021) Mammal communities in Kansas mined lands: Second year of Snapshot USA data collection. Kansas Natural Resources Conference, Virtual.

Below (L): Alex King holding a Spotted gar from Spring Creek near Riverton, KS; (R): Dr. Rider holding a falcon in Dartmoor, southern England.



Durbin, C., Whiteacre, M., & Rega-Brodsky, C. C. 2021. Mammal communities in Kansas mined lands: Second year of Snapshot USA data collection. Undergraduate Research Day at the Capitol, Virtual.

- <u>Goins S</u>., and Ghosh A. 2021. Surveillance study on *Culex* sp. In southeast Kansas and prevalence of West Nile virus in the mosquito population. KINBRE Annual Meeting, Virtual (iPoster Presentation) and Kansas Academy of Science Annual Meeting, Virtual (Poster Presentation 2<sup>nd</sup> Runner-up Award)
- Hammesfahr, A., **Rega-Brodsky, C. C**., Womack-Bulliner, K., & **Whitney, J.** 2021. Public misunderstanding of bats does not preclude positive attitudes towards bats in Missouri. Midwest Bat Working Group Annual Meeting, Virtual.
- <u>Headings, L</u>., **George, A.**, & **Rega-Brodsky, C. C**. 2021. Evaluating the avian and vegetative communities of Mined Land Wildlife Areas in Cherokee and Crawford counties. Kansas Natural Resources Conference, Virtual.
- Michael, T., Headings, L., Rega-Brodsky, C. C., & George, A. 2021. Geographic variation complicates identification of chorus frogs near range boundaries. Kansas Herpetological Society Annual Meeting, Pittsburg, KS.
- <u>Murray, M</u>. & **Rega-Brodsky, C**. 2021.Temperature decreases mammalian species richness nationwide. Pittsburg State University Research Colloquium, Virtual.
- Murray, M. & Rega-Brodsky, C. 2020. Temperature decreases mammalian species richness nationwide. Kansas Natural Resources Conference, Virtual.
- <u>Murray, M</u>. & **Rega-Brodsky, C**. .2021. Temperature decreases mammalian species richness nationwide. Undergraduate Research Day at the Capitol, Virtual.
- Nippoldt S., Belgum H., Utley C., Sharma N.K. and Ghosh A. 2021. Prevalence of ticks and tick-borne pathogens in mined land areas of southeast Kansas. PSU Research Colloquium, Pittsburg State University, Pittsburg, KS (Poster Presentation 4<sup>th</sup> place Award)
- **Rega-Brodsky, C. C**. & <u>Durbin, C</u>. 2021. The search for the spotted skunk in southeast Kansas. Kansas Natural Resources Conference, Virtual.
- Sisson, G. L., Buckardt, E. M., Rega-Brodsky, C. C., & George, A. 2021. A newly discovered eastern newt population on abandoned mined land in Southeast Kansas. Kansas Herpetological Society Annual Meeting, Pittsburg, KS.