

TERRAPENE TIMES



Adopt-A-Turtle Newsletter

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Research, education, outreach, & conservation

WASHBURN
UNIVERSITY
Biology Department

Washburn University's Day of Giving Approaches!

I am thrilled that the Washburn University Alumni Association has selected the Adopt-A-Turtle program again this year to be part of a great line-up of programs seeking donor support for the 2023 year via the annual Day of Giving!. You are receiving this newsletter because you have donated to the Adopt-A-Turtle program in the past, for which my students and I are extremely grateful. The Day of Giving is unique in that WU Alumni Association will help advertise programs to broader reaches of people I will ever likely be able to connect with on my own. Programs, like the Adopt-A-Turtle, often have a Matching Gift on this day which further helps increase our fundraising potential. Thank you so much to Bob and Helen Meinershagen for their past matching gifts and to those who have supported the program in previous years. Washburn University is not a research-based school with huge grant opportunities and does not typically provide teaching release time for research and external grant writing. For these reasons, the Adopt-A-Turtle

program has become a vital way for me to continue my hands-on fieldwork with student. The funds raised for the program help purchase equipment for use in the field (including yearly replacement of radio transmitters on the turtles) and housing at field stations. You can support the program again this year by spreading the news about the Day of Giving on February 2nd, 2023 and sharing this link: <https://washburngivingday.org/amb/turtle23>. This past calendar year I worked extensively with over 20 students seeking to do research with me and dozens more students in various class and outreach capacities. I feel really proud of the work we have done thus far and truly believe the generous gifts of donors to the program have been used to the best of my ability for student research and education and box turtle conservation. I will highlight some of our more recent success later in this newsletter. As always, thank you for your support!

Senior Highlight

It is hard to believe that Sally is a senior soon to graduate with a B.S. in Biology and a minor in chemistry. Sally began working with me as a freshman and I consider myself extremely fortunate to have been able to work with her for four years. In fact, Sally is one of the reasons I try and encourage any and all freshman potentially interested in research to join my lab early in their academic career. Because Sally began as a freshman she was able to fully develop and work long-term on a massive project with huge implications for box turtle conservation.

Sally, working extremely independently, was able to figure out how to use a complicated pattern recognition software program to ID individual turtles based on shell markings. This approach is far better for the turtle than what most (not me) people do to ID individual turtles long-term (i.e.-they notch shells with a saw or dremel). Sally has built a massive and functioning photo archive that we now regularly use as part of our normal 'turtle procedure'. See her photo archive upload link on the right side of this page. Congratulations Sally on graduating in the spring, you will be missed!

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CAN YOU GUESS WHAT IS GOING ON HERE?? SEE PAGE 2 PICTURE CAPTION FOR THE ANSWER!

Upload your photos of ornate box turtles and three-toed box turtles here: <https://forms.gle/XfuRp4q42GBbanqu5>



Above: Sally showing off her research poster presented at Apeiron in 2022. Her work over the past 4-years has been instrumental to our use of pattern recognition software for ID-ing individual turtles.

Brumation Cohabitation

Kaylyn Hobelman and I (Benjamin Reed) recently submitted an article for publication regarding brumation (ectotherm version of hibernation) cohabitation. What the heck does that mean? Essentially, using radio telemetry, we were able to confirm that multiple turtles are together and sharing the same overwintering burrows. In fact, at one of our field sites we have 3 holes occupied by at least two turtles and three holes occupied by at least 3 turtles. I say "at least" because these turtles could have additional winter roommates, but they don't have a radio transmitter and thus we may not know about them and their hole sharing. Ornate box turtles are not generally considered social (beyond mating) and thus these observations are somewhat unusual and of great interest to our research endeavors. We and other box turtle researchers occasionally find

turtles occupying the same hole during their active (summer) season, but these observations are far less (if at all) confirmed for overwintering periods. In a publication from 1960, Legler (box turtle legend) found 7 turtles in a hole together in October but by November all of the turtles except one had left the hole thus they didn't overwinter together. Another study (Metcalf and Metcalf, 1979) had large number of turtles brumating within only a few meters (or even centimeters) of one another but not in the same hole. However, these researchers had artificially boarded their brumation hotspot potentially forcing turtles to brumate in closer proximity to one



Above: Kelty (golden retriever) helping Kaylyn borescope a hole in search of turtles. Pg 1 Guess the Picture is of a new turtle found in a hole using a borescope.

another than they naturally would have. Our article submission, to the best of our knowledge, is the first confirmed documentation of brumation cohabitation. Further, each set of three turtles shared the same hole over 2021/2022, suggesting this was not a happy accident or one-off observation. Now the question is, are 'good' holes/burrows limiting at our field site forcing the turtles to congregate, or are turtles totally carefree of having roommates, or are these turtles choosing to spend the winter together, perhaps as a safety in numbers mechanism?

The Mysterious Lives of Uno and Tom

Working with long-lived animals like box turtles (can live 35-40 years in the wild) provides researchers with an incredible wealth of data and knowledge impossible to obtain from short-lived animals. For example, by studying an individual box turtle that has lived for forty years we can begin to understand how *individuals* adapt to changing environments. Typically, ecologists would discuss how *populations* evolve in response to environmental change as many study species have lifespans of just a few short years. However, one of the WU Turtle Team's major questions is how do individuals respond to change over time? In other words, how can they 'cope'? Are they flexible in the face of change or do their behaviors remain rigid and unyielding as the world around them changes? Ornate box turtles, as years of our lab's data show, have strong behavior types (personalities), which may make them less flexible (reduced behaviorally plasticity) in their behaviors as their habitat changes. As most who read this will know, the single best way to track individual animals (like turtles) over time is to monitor their behavior via radio



telemetry. Unfortunately, radio telemetry is not fool proof as transmitters sometimes stop working prematurely. A premature failure of a transmitter means the turtle is often lost from the study for good as they are generally nearly impossible to relocate without telemetry. However, this summer at our field site in Nebraska, we made several unexpected finds. Mason (pictured middle top) found Female #1 (who he named Uno), who had been missing/not seen since 2006; 7 years before I started my own research at the site! Fellow student researcher Keetan found F10 (named Megatron for her enormity) who had been missing since 2016 and I found M16 (named Tom, pictured middle bottom), a turtle I had studied intensely for 2 years before he went missing in 2015. What were these turtles doing all this time? How many other turtles might we find that have been missing for 7+ years? Starting in 2022, we have opted to start using moderately more expensive but significantly more reliable transmitters.

Kansas Herpetological Conference 2022

Every November the Kansas Herpetological Society (KHS) hosts the KHS Annual Meeting (Conference) somewhere in the Midwest. This year the conference was held in Joplin, MO and was attended by several hundred student and faculty researchers. Amongst those in attendance was the WU Turtle Team, which turned out to be quite the large group! In total, we had 11 people from Washburn University attend plus several of my students were authors on posters presented by our collaborators in Iowa (at Coe College). Thus, the Turtle Team made quite the showing/impact this year! Overall, students presented 6 different posters, with many student researchers being co-authors on each other's posters. Designing studies and collecting data in the field is often perceived as the 'fun' part but the students and I had a great time presenting our research and learning about the research of others the entire weekend. The amount of time and effort each and every student put into data collection, data organization, data analysis, graphing, poster-making, and presentation practice was extraordinary this year and I am very proud of the entire group. Attending conferences and presenting research posters and/or talks is of great value for students seeking to build their CV/resume and I am confident the effort the students put into this conference will be rewarded in the future as they seek employment or post-baccalaureate education upon graduating. Next, students and I are planning on presenting at the Midwest Ecology and Evolution Conference in Louisville, KY in late March. In the meantime, we will be prepping for research next year and focusing on drafting manuscripts for submission to journals for publication.

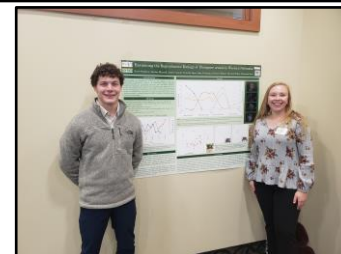


Figure 2. Top: Left to Right: Mark, Layne, Kaylyn, Dr. Benjamin Reed, Keetan, Dr. Paul Wagner, Dr. Tracy Wagner, Abby, Bri, Katie. Bottom left: Sam Wagner poses in front of Layne as he presents their poster on a potential hybrid zone between ornate and three-toed box turtles in Kansas. Bottom right: Keetan and Katie pose in front of their poster regarding their use of a field-portable ultrasound to determine female turtle reproductive cycles in the wild.

Remembering Leah and Lydia

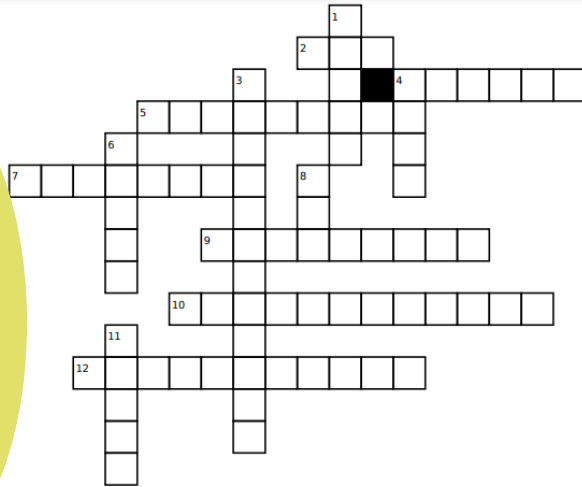


Figure 1. F19 (Leah) at the time she was first discovered in 2019. This photo has quickly become one of my favorites but now I will be saddened each time I see it knowing this turtle was needlessly killed. Prairie burning at bad times, mowing, discers, plows, cars, and more all kill turtles each year. RIP Leah.

In the story on page 2 I talk about the great joy associated with relocating lost turtles, especially when they have been missing for half a decade or more. However, studying turtles is not always about finding new turtles or long-lost friends of the past. The turtles you Adopt, the ones we study, are wild animals and do face the vagaries of life any wild animal would experience. Unfortunately, for turtles, the causes of their death are often human-related. This year, I was devastated (and still am) for the loss of two of our original study animals at my Lawrence site. F7 (Lydia) and F19 (Leah) have been part of the study since 2019. Lydia was killed by a human on a public property she had wandered onto. This senseless act appeared to be done for no reason. Leah was killed by a hay baler in a field she rarely spends time in. Mowing extremely low to the ground is devastating for turtles as they cannot escape the blades in time. Both of these turtles, and many many more, have been killed by human activity, and I really hope to see positive change in how people interact with the world around them. We can start by drawing attention to known problems and providing solutions, such as raising your mower deck just a few extra inches or planting native vegetation in lieu of non-native flowers.

We're on the Web!

<https://wu-turtle.weebly.com/>



Down:

1. student who found F1 (Uno)
3. last name of previous year's matching donor
4. turtle killed by a discer
6. student whose research focused on pattern recognition
8. male turtle that been missing since 2015
11. student who conducted research on box turtle reproductive cycles

Across:

2. only student that attended KHS conference but not pictured in group photo on page 3 (name is provided)
4. last name of "box turtle legend"
5. device used to find turtles in holes
7. large female turtle that had been missing since 2016
9. term for ectothermic (non-mammalian or avian) **hibernation**
10. term used to describe two or more animals sharing an overwintering hole together
12. WU event that happens on February 2nd of 2023

Answers: 1 Mason, 2 Sam, 3 Meinershagen, 4D Leah, 4A) Legler, 5 BoreScope, 6 Sally, 7 Megatron, 8 Tom, 9 Brumation, 10 Cohabitation, 11 Kate, 12 Day of Giving

Dr. Benjamin Reed
Stoffer Science Hall
Room 203-H
1700 SW College Ave
Topeka, KS 66621

E-mail:
benjamin.reed@washburn.edu
or
wuadoptaturtle@gmail.com



Fall 2022 Highlights

These newsletters tend to have lots of text, perhaps too much. Thus, I have created a website (link above) where a collage of photos can be seen on the homepage.

Below is a summary of the WU Turtle Team Fall 2022 highlights:

- Mark, Bri, Samantha, Sally, and Keetan all get recognition of their ongoing research via WTE Scholarly and Research awards in December/January!!
- KHS Conference, 12 attendees from WU and 6 student posters presented!
- Kaylyn and I submit article on Brumation Cohabitation; 1 other paper currently in review
- The WU Turtle Program is highlighted in the TOPEKA magazine (pictured to right). A link to the story can be found here: https://issuu.com/sunflower_publishing/docs/tm22wi
- Cat, Quang (pictured to right in middle), and Madison (left) join the WU turtle team in the fall!

