Terrapene Times

Adopt-A-Turtle Newsletter

May 2021 Volume 1, Issue 3

Research, education, outreach, & conservation

Inside this issue:

Do box turtles have personality?

If you are reading this newsletter that probably means one of at least several things about you: 1) You donated to the Adopt-A-Turtle program (thank you!!), 2) You like turtles, 3) You will not need much convincing that ornate box turtles have personality. I (Benjamin Reed; principal investigator of the turtle research team at Washburn University), have formally been studying box turtle behavior since I first started my master's research in 2013. Personality in animals may seem like a strange concept, but research at some of the best institutions around the world have demonstrated that animals do indeed have personality, coined 'behavioral syndromes'. Behavioral syndromes (repeated behaviors across time and context with consistency relative to other individuals in the same population) are hypothesized to promote species persistence. In essence, different personality traits are best suited for different environmental conditions. Since we know environmental conditions are always changing (naturally and human-induced) that means at least some subset of a population will always be better suited for the habitat. For example, more risk-prone animals do better when predation threat is low and more risk-averse animals do better when predation threat is high. Although personality traits have been shown in many taxonomic groups including fish, insects, birds, mammals, amphibians, reptiles, and turtles, there are still challenges of actually linking an individual's personality traits to their behaviors in the field. This is where box turtles really shine (continued on page 2).

Amelia and Derek work in our makeshift lab space at Baker Wetlands Discovery Center. Here, the students are assaying turtles for their consistency in risk-taking behaviors.

←The Adopt-A-Turtle fund helped cover the cost of equipment and WU student housing at Cedar Point Biological Station!

"TRY TO BE LIKE THE TURTLE- AT EASE IN YOUR OWN SHELL."

-BILL COPELAND

Graduating Senior Highlights

This spring semester two turtle research team members graduated: Olivia Welch and Jacob Heit. I had the privilege of working with both Olivia and Jake for multiple semesters. Each student earned a WTE research grant for their respective project, each presented at a conference (Olivia at the Midwest Ecology and Evolution Conference; Jake at Washburn's Apeiron). Olivia's project used novel thermal imaging techniques to determine whether ornate box turtles displayed more thermoconforming or thermoregulatory behavior. Jake's project involved scoring turtle shell damage (teeth and scratch marks) to determine past predation experiences. Both projects were a success. Best of luck to Jake in Dental School and to Olivia as she pursues veterinary school! (you got this!). Best of luck to you both!

Olivia radio-tracking for her thermal imaging project.

Ornate box turtle personality continued…

I believe that ornate box turtles can be a model system for linking behavioral syndromes (personality traits) to other aspects of the animal's ecology, including their ranging, body condition, mating/nesting efforts, thermoregulation, and more. Aubrey Gauntt, Sam Wagner, Amelia Weller, Kaylyn Hobelman, Becca Tolbert, Shelby Bloom, Colin Nelson and others have jointly spear-headed a massive project with me this past year to study personality in box turtles. We've repeatedly assayed over 45 turtles for their behavior types (along axes of shy/bold; active/inactive; exploratory/non-exploratory) while simultaneously and diligently monitoring the animal's daily movement, seasonal ranging, philopatry, parasite load, shell temperature (as a proxy for body temperature), mating/nesting activity, and predation attempts. This project has involved turtles in Kansas and Nebraska and the results are clear: turtles have consistent and repeatable personality and that these personality traits do in some way correlate to nearly every other aspect of the individual's ecology we've examined. We're expecting to submit our findings to a journal for publication by the end of June! The project is ongoing and we are nearly tripling our efforts this summer while also expanding into Iowa (as well as new sites in Kansas).

Aubrey (Washburn), Megan (UNL), and Natalie (UNL) work together to process turtles. Processing turtles involves getting weights and about 20 different measurements per turtle, adding/removing/replacing radio transmitters (to monitor movements in the field), downloading shell temperature reports from the individual's thermochron, and getting a complete set of photos per turtle.

Same Sally, Different Design

To say that turtles are unique would be an understatement. What other sort of creature permanently lugs around a heavy bony shell, can live to be 100+ years old, has more personality than most tv stars (not up for debate), is positively represented in nearly every religion there is, and outlived the dinosaurs? If that's not enough, each ornate box turtle's shell patterning, both the top (carapace) and bottom (plastron) is unique like a snowflake. Sally has been diligently investigating this phenomenon since she was a freshman and in her second year (this year), presented her work at Washburn's Apeiron Conference. Using pattern recognition software designed for whale flukes and zebra stripes, Sally has repurposed the program to identify turtles based on their unique shell patterning. There are many challenging obstacles to this ongoing project, but Sally has overcome them all. Obtaining pictures, labeling pictures, cropping pictures, learning the relatively non-user-friendly program (Wild.ID) building reference databases, testing unlabeled or unknown turtles, and repeating for different populations and time periods, and for the same turtle with and without a transmitter epoxied to its carapace. Being able to identify turtles using photos is, in my opinion, a significantly better option than shell notching and plastron dremeling (our lab does neither). One of Sally's primary objectives is to determine if there are population level differences in patterning. In other words, do ornate box turtles in Kansas look different than ornate box turtles in Nebraska, Iowa, or elsewhere? This study can be useful because box turtles are facing a poaching crisis. Knowing the general location of where turtles are being collected based on patterning differences (hopefully we could eventually we can narrow it down to specific populations) can help law enforcement target specific areas to monitor or protect. You can help our conservation efforts too by uploading pictures to our new online photo database! (link directly to the left).

Figure 1 Sally presenting her awesome research project at Washburn's very own Apeiron conference. Attending conferences during COVID times can be challenging but Sally was more than up to the task!

Sally, Chase, Kelsey (left to right) at K-State's Konza Prairie on a scouting mission.

Upload your photos of ornate box turtles and three-toed box turtles here:

https://forms.gle/XfuRp4q42GBbanq

Roadside Manners: Helping turtles cross roads

I've been told by many 'old-timers' throughout Kansas that there once was a time when driving a dirt road in Spring and early summer would result in countless ornate box turtle observations. Nowadays, ornate box turtle populations are declining, and sightings are becoming more and more rare. Unfortunately, road mortality continues to be one of the top killers of box turtles throughout their range. Obviously, the best way to mitigate road mortality is to drive safely and be observant. If safe, quickly pull off the side of the road, and help the turtle cross the road. Here is the most important thing: move the turtle in the direction it was already going and do not relocate up or down the road, even if the area seems poor for the turtle. They are habitually philopatric animals (routinely use the exact same areas each year for brumation, nesting, and foraging) and relocating them even 10m away from their 'home' can result in them dangerously trying to get back to where they want to go. It is important to handle the turtle correctly so as to not startle or accidentally drop them on hard rock or pavement, cracking their shell in the process. Turtles can bite hard, and their feet are strong and equipped with sharp claws. Hold the turtle by the top of the shell, placing one or two fingers on the middle underside (plastron) for support, head aimed away from you. This approach works for most turtle species. Snapping turtles and softshell turtles, also definitely worth helping, should NOT be picked up by the tail as this can damage their vertebrae. Pick them up by grasping the shell right behind their head and the edge along their posterior end. Push them along if necessary. Be careful and be a #turtlehero.

WU Turtle Team PI Benjamin Reed poses in front of a roadsign for "Box Turtle Rd". Help turtles cross the road whenever possible. Send them in the same direction near where you initially found him/her.

Adopt-A-Turtle Funds

The WU turtle research team would like to extend a massive thank you to the Washburn University Alumni association for hosting the Adopt-A-Turtle program for a second year. The program was a huge a success and the turtle team would also like to extend a massive thank you to all the donors and supporters of this program. This year we raised $5,600, boosted by the generous match-for-match contribution by Bob and Helen Meinershagen. The funds have also been supplemented by student grants and funding secured by myself (Ben). Funding raised this year has already been used to purchase radio transmitters, additional GPS's,1 new radio receiver, and student housing at Cedar Point Biological Station in western Nebraska. Three WU students lived out there this past summer and three new students (Mason, Samantha, and Haley) will be living out there for six straight weeks this summer. Funds are also used to buy supplies for caring for sick and injured turtles, including turtles hit by cars (see article above). I would also like to thank the many generous landowners and various field stations that allow the research team to use their property/space for box turtle research.

Chelonian Taxonomy

I have a colleague who, thanks to collaborating with me, is insistent on calling box turtles chelonians, rather than simply calling them 'turtles'. Why is that? Turtle taxonomy, or naming, is difficult and confusing, with many overlapping terms and inadequate definitions. Chelonians is the 'official' term used to describe all extant turtle/tortoise/terrapin species and the term testudines can be used to include extinct chelonians as well. So what is an ornate box turtle? Is it actually a turtle or can it be better defined as a tortoise? Here, things get sort of murky. The term turtle is best reserved for marine turtles (of which there are seven recognized sea turtle species) and tortoises are reserved for large land-dwelling, herbivorous chelonians with club feet such as the famous Galapagos Tortoisse or Aldabra Tortoise. Ornate box turtles, despite being primarily land-dwelling are not tortoises nor are they sea turtles. Their genus is *Terrapene,* with 'terrapin' being a term reserved for turtles that occupy both terrestrial and freshwater habitats. Perhaps a broad name is best? For common name, I say we sick with ornate box 'turtle', but if we want to sound cool with all of our friends we should refer to them as chelonians, instead of the broader terms of turtle or terrapin. For sure though, they are not a tortoise.

We're on the Web!

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

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Conservation	Personality	Persistence	Terrapene
Plastron	Chelonian	Philopatry	Carapace
Ornata	WildID	Donors	Adopt

Fall/Spring 2021 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.

Here is an abridged 2020 highlight reel related to the chelonian (turtles) research program at Washburn University

- Washburn Day of Transformation grant awarded to Jacob Heit. Congrats!
- Four students (Aubrey, Sam, Shelby, and Steven) presented 15-minute each oral presentations at the Kansas Herpetological Society (KHS) Meetings. They were well received and resulted in new collaboration with Iowa/Coe College herpetologist Dr. Daniel Hughes!
- Brice presented his fire ecology research (discussed in last newsletter) as a poster at KHS and won first place. Congrats Brice!

- Jake and Sally presented their research via posters at Washburn's Apeiron conference. Great job guys!
- Five new students joined this Spring/Summer: Mason, Samantha, Haley, Sean, and Elise. Welcome all!
- New field site near Topeka is being established for comparative work to our site closer to Lawrence. 20 turtles have been located so far, mostly by turtle finder extraordinaire Colin (pictured above w/ Aubrey).