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Front Cover: Photograph of juvenile *Heterodon platirhinos (L)* and *H. nasicus (R)*. Both specimens are from the Pratt/Kiowa County line. Photo by J. Daren Riedle, 2019.

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KHS BUSINESS

Letter From The Editor

An organization is only as good as its members. Members who are dedicated to helping the organization achieve its mission. Members who are willing to donate their own time and resources to ensure the success of their society. I first joined the Kansas Herpetological Society around 1991 and was soon serving in varying capacities within the society just a few years later. I eventually took a short hiatus as I travelled around the southwest pursuing employment and graduate degrees. As soon as I ended up back in the Great Plains I jumped right back into the mix. The Kansas Herpetological Society has been an integral part of my professional growth and I have thoroughly enjoyed giving back to it when I can. I know that many folks feel this way, which is why the Kansas Herpetological Society has continued to thrive for the last 45 years. Now I am stepping into what may be, to me at least, the most intimidating role I have played for KHS, editor of *Collinsorum*. *Collinsorum* and its earlier incarnations have always served as the public record of the society, and to revisit old issues is to delve deep into the rich history of Kansas Herpetology. I will do my best to maintain this tradition during my tenure as editor. All past issues of the society publications can be found on our website at ksherp.com.

A common trend among state agencies is reviewing the utility of citizen science as a means of tracking biodiversity. Examples of the important history found within KHS publications are the field trip reports and herp counts. In this issue of *Collinsorum*, there will be a quantitative review of KHS hosted herp counts with some suggested protocols to improve their utility. Hopefully everyone will jump on it and submit more of their counts in 2020. Speaking of submissions, as editor I challenge all of you to remain active or become more active within the society. Attend meetings and field trips and report your findings here in *Collinsorum*. Trust me, it is not as intimidating as it seems, and our editorial staff are here to help. Go back and read the note o the first report of the Rough Earthsnake in Labette County in the previous issue (8_1_2019), written by an eighth-grade student. This is a great example of the types of observations that can be reported in *Collinsorum*. We are always looking for notes on new distributions, interesting behavior, and seasonal activity.

As I begin to piece this issue of *Collinsorum* together I am also happy to report that KHS, its executive committee, and its council members also worked together to support some important legislation. in another case they worked together to oppose a piece of legislation that would have been very detrimental to all wildlife in Kansas. So again, I extend my thanks to all our members.

I will keep my missives short this time around but look forward to communicating with you through future issues of *Collinsorum*. There are exciting things happening regarding KHS itself, as well as the conservation field in general.

J. Daren Riedle
Editor

Correction

In the 9_1 2019 Issue of the *Collinsorum* I made a glaring ommission. I did not attribute the 45th annual meeting summary to any particular author. Lynnette Sievert was the host of the 45th annual meeting and authored the meeting write-up. My apologies Lynette.

KHS Signs on to Protect America's Wildlife

On January 23rd, the Kansas Herpetological Society added our name to the list of over 57 conservation organizations supporting the Protect America's Wildlife and Fish in Need of Conservation Act (S. 2491 / H.R. 4348). This bill aims to restore critical protections from imperiled species by repealing the Trump Administration's wreckless regulations gutting the Endangered Species Act. The support letter reads as follows:

On behalf of our millions of members and supporters nationwide, we urge you to support the Protect America's Wildlife and Fish In Need of Conservation Act (PAW and FIN Conservation Act), [S. 2491/H.R. 4348]. This critical legislation would restore vital protections for our nation's most imperiled species by repealing the Trump administration's recently finalized regulations that gravely weaken the Endangered Species Act.

One million species are at risk of extinction—many within decades—due to human activity, according to an authoritative and devastating report released this past May by the United Nations' Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. The report warns that the health of ecosystems upon which humans and all other species depend is deteriorating globally at unprecedented rates, with grave implications for our economies, livelihoods, food security, health, and quality of life worldwide.

The Endangered Species Act is our nation's most effective tool for protecting species threatened with extinction. Given the unprecedented threats to these species, we need a fully funded and actively enforced Act now more than ever. Unfortunately, the Trump administration is attempting to take us in exactly the wrong direction at this critical time. In August 2019, the U.S. Departments of Interior and Commerce finalized regulations that fundamentally undermine key portions of the Endangered Species Act. The Trump administration's rollbacks undermine the law by making it more difficult to extend protections to newly-listed threatened species and removing language prohibiting economic considerations from factoring into decisions about whether a species should be protected under the Act. Further, the regulations make it easier for companies to advance industrial projects in critical habitat areas that are essential to species' survival and more difficult to protect imperiled species that are most impacted by climate change.

By undermining the Endangered Species Act, the Trump administration's regulations not only risk the future of species like gray wolves, polar bears, and humpback whales, but further threaten the balance of fragile natural systems on which we depend for survival.

The PAW and FIN Conservation Act reflects Americans' desire for stronger protections for imperiled wildlife. Roughly four out of five Americans support the Endangered Species Act and want to see its protections upheld. It should therefore come as no surprise that when the administration released the final Endangered Species Act regulations, the public response was resoundingly negative, with media stories condemning the rules outnumbering those in favor eight to one.

Protecting our natural heritage—including threatened and endangered species—is a core American value. It is up to us to preserve wildlife and their habitats for our children's children, and to protect the health of the ecosystems upon which we and all other species depend. We urge you to help save our most imperiled plants and animals from extinction by supporting [S. 2491/H.R. 4348].

Sincerely,

Christopher Visser
KHS President

KHS Opposes House Bill No. 2669

On 12 February 2020 HB2669 was introduced into the Kansas State Legislature. HB 2669 would require that the Kansas state threatened and endangered species list be based solely on the federal threatened and endangered species lists. If passed it would remove protections from state listed species that are essential to proactive conservation and help preclude the need to list at the federal level. It would remove the locally driven petition process and remove a major vehicle for public participation in the listing process. The bill would also increase federal oversight on the management of fish and wildlife in Kansas.

A hearing on HB 2669 was held by the house agricultural committee in Topeka on 18 February 2020. Committee members opted not to vote on the bill and no additional hearings have been scheduled at this time. This tabling of the bill was due in part to the outpouring of opposition from the greater Kansas conservation community.

The KHS letter of opposition dated 16 February reads as follows:

Honorable State Representatives,

I am writing to you on behalf of the membership of the Kansas Herpetological Society to express our sincere opposition to HB 2669. We are a body of professional, academic, and citizen-biologists and have several reasons which we feel this bill would be harmful to the future of precious living resources in the state of Kansas.

The requirement in this bill for the Kansas Department of Wildlife, Parks, and Tourism (KDWPT) to classify a species as threatened or endangered only if that species is already on the federal threatened and endangered species list according to the Endangered Species Act ignores the Kansas Nongame and Endangered Species Act of 1975. This act charges KDWPT, not the United States government's agencies, with safeguarding and managing Kansas's natural resources. Additionally, this bill would assume a level of specific Kansas interest on the part of those agencies that is both unlikely to be adequate and potentially over-restrictive in unforeseen ways.

The Endangered Species Act of 1973 (ESA) was an attempt to focus limited resources to recover imperiled species most dear to national interests. Proactive conservation is a much more economical, not to mention effective way, to conserve species before they are imperiled. This not only is of greater benefit to those species, but is also possible with less regulatory oversight and fewer financial costs as well. The gap between ignorance of a species' status measures to save it from extinction through the ESA is filled by finer-grained measures such as the Kansas Nongame and Endangered Species Act, ones that allow local experts and nearby stakeholders to partner in saving the resources in their areas before they would ever require recovery under the ESA.

This bill would also seem to actually further erode one of the conditions mentioned in the ESA to qualify for federal protection: inadequacy or lack of existing regulatory mechanisms. A lack of state-level regulations regarding a species is the exact situation to which this speaks. By removing these regulations in the state of Kansas, the likelihood for even more-stringent federal regulations and penalties under the ESA is high. The Scotts Riffle Beetle and the Arkansas Darter are examples of two species that were protected in time by the state of Kansas and thus did not come to need the ESA to attempt their rescue. Removing KDWPT's role in the regulatory process means that these species, some of which are endemic to this region, would be on an equal footing with more-charismatic but lesser-imperiled species from across the nation. The fact that there is already not enough federal resources to identify, list, and protect all of the species that need it is nothing compared to the irreplaceable time lost in a species rising up in the stack of priorities while it passes forever from existence.

Wildlife is not all that suffers if this bill is passed. The regulations and also the penalties under the Kansas Nongame and Endangered Species Act are far less burdensome than those prescribed in the ESA. Farming and ranching practices, the lifeblood of much of Kansas, are exempt. Most other activities, if in conflict with the Kansas act at all, require little to no mitigation efforts. This greatly saves time and money for regulators and the regulated alike.

Kansans have long looked to and relied on the professionals of the KDWPT in protecting Kansas species and ensuring the future of *these animals to benefit humans and wildlife alike. Because of the unique location Kansas occupies, many of these species occur near or at the edges of their natural distributions. This means that while Kansas may have a population of a species that also occurs many other places, the specific population in Kansas may be the first place where we would be able to measure a species' successful expansion…or watch it all too quickly begin to disappear. The front-line soldiers in this fight are state and local conservationists, ecologists, and biologists, like those at the KDWPT. They are the ones with the experience, proximity, and base of knowledge necessary to decide when a species needs to be protected and when it does not.*

In closing, I would just like to state once more that the Kansas Herpetological Society, an organization dedicated to the study and conservation of reptiles and amphibians in Kansas, strongly opposes HB 2669. We do this not just because of what it does in terms of conservation, but of what it does not do: allow those with Kansans' best interests in mind to be in the best position to safeguard those interests for all Kansas, past, present, and future.

Thank you for your consideration in this matter.

Sincerely,

Christopher C. Visser, President
Kansas Herpetological Society

KHS ANNOUNCES 2020 FIELD TRIPS

The Kansas Herpetological Society is excited to announce the locations of its 2020 Field Trips.

KHS 2020 Summer Field Trip
Location: Kingman County State Lake
Date: July 17-July 19

KHS 2020 Fall Field Trip
Location: Hollister Wildlife Area
Date: September 25-September 26

Please follow the Kansas Herpetological Society on Facebook for up to date details.

-Travis Taggart KHS Field Trip Chair

In Memoria

Suzanne L. Miller, 1946-2020

We are mourning the loss of our friend, Suzanne Miller, who passed away March 8, 2020. Her friendly nature earned her friends all over the world and while traveling, she captured beauty and culture in her exquisite photographs. Her love of nature was expressed in her photography and in the abundant garden of vegetables and flowers she shared with friends and neighbors. These traits and many others made her a good and loyal member of KHS for many years. She was often seen, camera in hand, at KHS field trips and annual meetings with her husband and longtime KHS member Larry.

She is survived by her husband Larry, her sister Sherry Johnson, brother Steve Sears, and two nieces. Her latest rescue dog, Maxell, was one of many who she loved and who loved her over the years.

The Executive Board of the Kansas Herpetological Society extends its deepest sympathies to the family and friends of Suzanne. A donation in her name has been made to KHS.

Photo Courtesy of Larry Miller

KHS Reinvigorates Annual Herp Counts

In 1989 KHS first sponsored what were known as its Spring Herp Counts, a controlled census of amphibians and reptiles. The original counts were slated to take place in April and May. The counts were quite popular and conducted frequently for more than a decade, but slowly faded away. A major article in this issue of *Collinsorum* revisits these counts to investigate the utility of these data for biodiversity monitoring. In order to maintain monitoring efforts in the state, KHS is hoping to reinvigorate the annual herp counts. We encourage all of our members to get out, participate, and submit your counts for publication in *Collinsorum*. Below are some basic rules and thoughts for setting up your personal herp counts.

- Counts can take place any time of the year.
- Pick sites that can be repeatedly surveyed at roughly the same time every year.
- When possible sample sites in under-sampled counties. See article in this issue for a list of under-represented counties.
- The minimum level of data that should be provided includes:
  - -The county where the count occurs
  - -A GPS point where the count occurred*
  - -Start and stop times of the count
  - -A complete list of names of participants
  - -A list of all species and the number of individuals observed
  - -Also note anuran choruses, egg masses or other observations of note
- Be sure to have a hunting license on your person whenever you are herping, and always have landowner permission before entering private property.

Please submit all your counts to *Collinsorum* by e-mailing them to:
daren.riedle@ks.gov

*If you are concerned about publicly publishing the GPS point, let us know and we will only share with partner agencies/ organizations for biodiversity tracking purposes.

-J. Daren Riedle

Articles

Revisiting Kansas Herpetological Society Field Trip and Herp Count Data. Distributional Patterns and Trend Data of Kansas Amphibians and Reptiles

J. Daren Riedle, Kansas Department of Wildlife, Parks, and Tourism. 512 SE 25th Ave, Pratt, KS 67124. daren.riedle@ks.gov

Introduction

Proponents of citizen science have long argued that ecology and conservation would benefit from its greater use. Citizen science allows for more boots on the ground and the ability to collect data at broader spatiotemporal scales coupled with fine-grain resolutions (Burgess et al. 2016). Citizen science can also be a cost-effective approach to modeling species distributions and rare species occurrences (Robinson et al. 2017; Tiago et al. 2017). Yet, even though the number of citizen science projects are growing they are still infrequently used based on publication rates. Barriers to use are a narrow awareness among biologists of projects that fit their needs and the fact that not all biodiversity science is well-suited for citizen science (Burgess et al. 2016).

The Kansas Herpetological Society (KHS) was founded in 1974 and one of its first charges was to better understand the occurrence and distribution of amphibians and reptiles across the state. From its inception the KHS has hosted field trips to various parts of the state, then in 1989 Spring Herp Counts, a controlled census of amphibians and reptiles during the months of April and May, were introduced (Collins 1989). Between the organized field trips and the Spring Herp Counts KHS has maintained one of the longest-running citizen science programs in the state. Rundquist (1999) provided a decadal review of these spring herp counts, but to date no quantifiable review of the counts or field trip data has been performed.

Spatiotemporal data on the occurrence and abundance of flora and fauna is integral when natural resource agencies are determining a species status. Realizing the untapped potential within the KHS field trip reports and herp counts, I wanted to determine whether the current data available were useful from a management perspective. The goals of this exercise were to determine whether the data collected by KHS provided 1) data on distributional patterns of amphibians and reptiles in Kansas and 2) whether temporal trends in occurrence could be observed using the available data.

Methods

I utilized the digital archive on the KHS web site (http://ksherp.com/) to peruse all back issues of the *Kansas Herpetological Society Newsletter, Journal of Kansas Herpetology*, and *Collinsorum*. Any field trip or herp count report that provided a locality at least to the county level, and a complete species list with total number individuals observed were entered in Excel. Additionally, I recorded latitude and longitude for each count. Latitude and longitude were either recorded at the site of the count, or the center of the county if the exact locality of the count was not provided.

When sampling species assemblages, there is a question as to how many samples are required to detect all possible species at each site. To determine this I constructed species accumulation curves for the ten counties with the highest number of counts. Species accumulation curves were constructed using program EstimateS (Colwell 2013). For each subsequent count the number of new species observed is added to the curve. Once the curve reaches asymptote then one can consider that they have accounted for all possible species that can be observed at that site. Rarefaction curves were then created by resampling the pool of N samples multiple times and plotting the average number of species found in each sample (Gotelli and Colwell 2001; Chiarucci et al. 2008). If a site has not been sampled

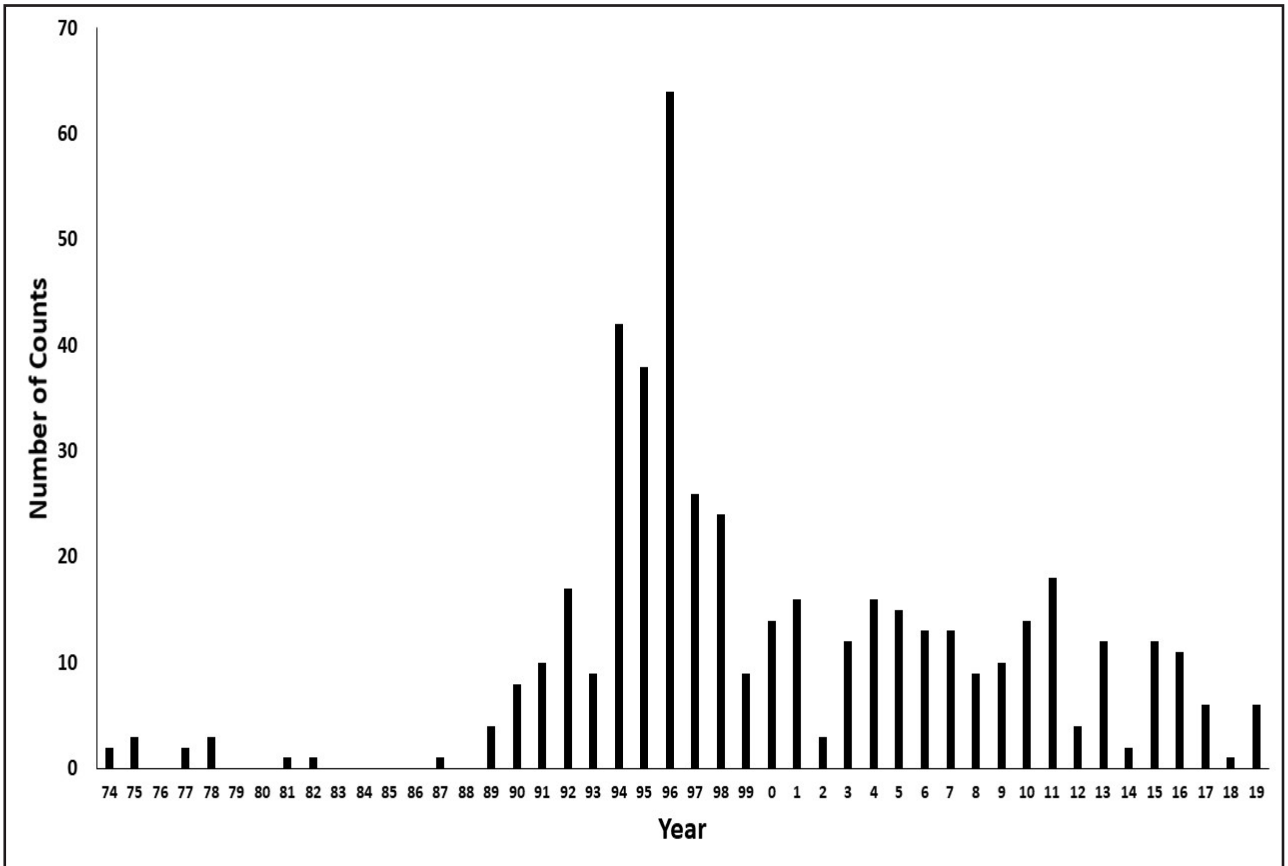

Figure 1. The number of combined KHS field trips and herp counts per year.

an adequate number of times for the species accumulation curve to reach asymptote, rarefication allows one to look beyond the actual number of samples to determine the number of samples required. Rarefication was carried out to 50 samples for each county.

I looked at species assemblage patterns across the state using Detrended Correspondence Analysis (DCA), a form of indirect gradient analysis. Assuming amphibians and reptiles segregate along environmental gradients, one should detect species patterns across a hypothetical space represented by the distribution of counts (ter Braak and Prentice 1998; Palmer 1993). Thus, the spacing of species within a DCA output represents the amount of change or beta diversity along a gradient. To simplify interpretations of the output, I ran separate DCAs for amphibians, lizards, snakes, and turtles.

To look for temporal changes in species compositions between samples at the same site I calculated similarity indices using a Chao-Sorensen abundance-based estimator in program EstimateS (Colwell 2013). The closer the index values are to 1, the more similar the composition is between samples. The closer to the value is to 0, the more dissimilar the composition between samples.

Results

I entered results for 472 counts representing 81 of the 105 counties in Kansas (Appendix A). These counts accounted for 94 species and 74,184 individuals of amphibians and reptiles (Appendix B). The number of counts peaked in the mid-90s when many KHS members were contributing to the annual spring herp counts, but the number of counts tapered off again towards the turn of the century (Fig. 1). I was not able to include many of the early field trips as the information provided on species and the total number of individuals observed were incomplete. Through the years there were also inconsistencies in how locations were reported, so for all analyses, counts were reported at the county level only. Other caveats to data entry were that person hours were not always reported for counts.

There were 15 counties with 10 or more recorded counts, and Linn County had the most counts for any county at 29 (Appendix A). Number of counts ranged from 14-29 for the ten counties with the most counts. Rarefaction curves begin to reach asymptote at 15-17 counts for each county (Fig. 2).

Ordinations for amphibians fall out along both latitudinal and longitudinal gradients (Fig. 3). Longitude is represented by the horizontal axis and latitude by the vertical axis. Species falling out near the origin of both axes are considered generalists. The eastern assemblage of amphibians includes Small-mouthed Salamander (*Ambystoma texanum*), Southern Leopard Frog (*Lithobates sphenocephalus*), Green Frog (*L. clamitans*), Eastern Narrow-mouthed Toad (*Gastrophryne carolinensis*), and American Toad (*Anaxyrus americanus*). The western assemblage was represented by Western Tiger Salamander (*Ambystoma mavortium*), Plains Spadefoot (*Spea bombifrons*), Green Toad (*A. debilis*), Great Plains Toad (*A. cognatus*), Woodhouses Toad (*A. woodhousii*), and Spotted Chorus Frog (*Pseudacris clarkii*). Latitudinal variation was greatly influenced by more southerly ranging species. In particular were the observations of Spring Peepers (*P. crucifer*) and Crawfish Frogs in the southeast part of the state, and Strecker's Chorus Frogs (*P. steckeri*) in the extreme south-central portion of Kansas. Generalists, or in this case more wide-ranging species included Blanchard's Cricket Frogs (*Acris blanchardi*), Plains Leopard Frog (*L. blairi*), Bullfrog (*L. catesbeianus*), and Western Narrow-mouthed Toad (*G. olivacea*). The three species of native plethodontid salamanders were excluded from the analysis as they were only observed at one site in the extreme southeastern corner of the state.

Latitude appeared to play a stronger role in species partitioning among the lizards (Fig. 4). Based on the location of the origin of the horizontal and vertical axes, few lizard observations were made in the western portion of the state. Five-lined Skinks (*Plestiodon fasciatus*) and Broad-headed Skinks (*P. laticeps*) were species typically found at far eastern sites. The Coal Skink (*P. anthracinus*) was only observed at more northeastern sites. Great Plains Skinks (*P. obsoletus*), Eastern Collared Lizards (*Crotaphytus collaris*), Texas Horned Lizards (*Phrynosoma cornutum*), and Six-lined Racerunners (*Aspidoscelis sexlineata*) represented the more westerly assemblage. Southern Prairie Skinks (*P. obtusirostris*) and Lesser

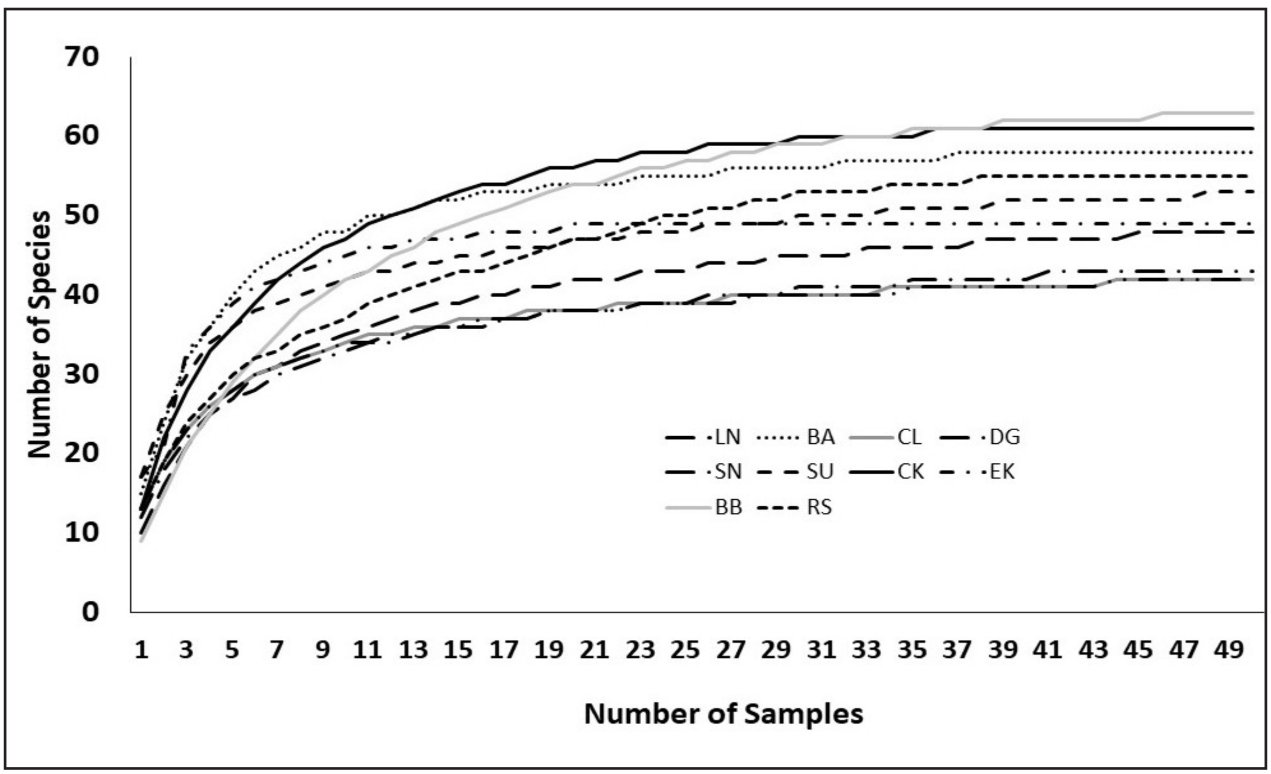

Figure 2. Species rarefication curves for the ten counties with the highest number of counts.

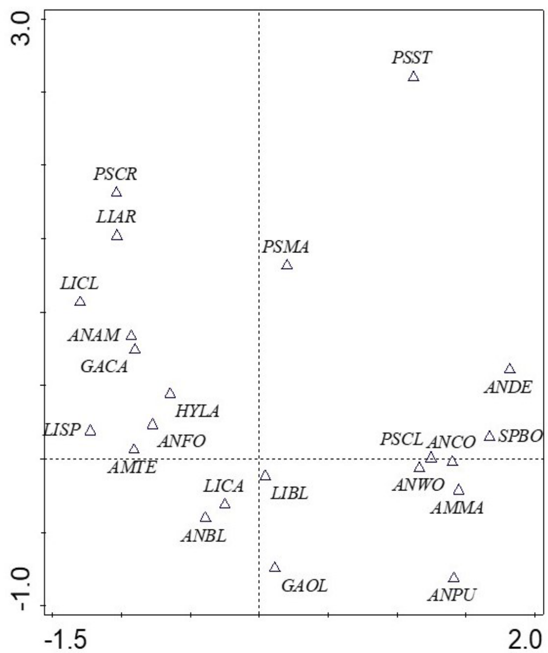

Figure 3. Ordination of amphibian scores based on weighted abundances of species at each sampling site. Species codes are defined in Appendix B.

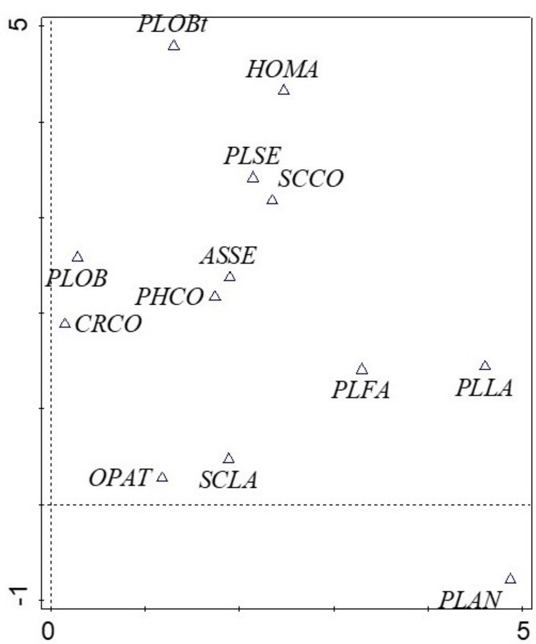

Figure 4. Ordination of lizard scores based on weighted abundances of species at each sampling site. Species codes are defined in Appendix B.

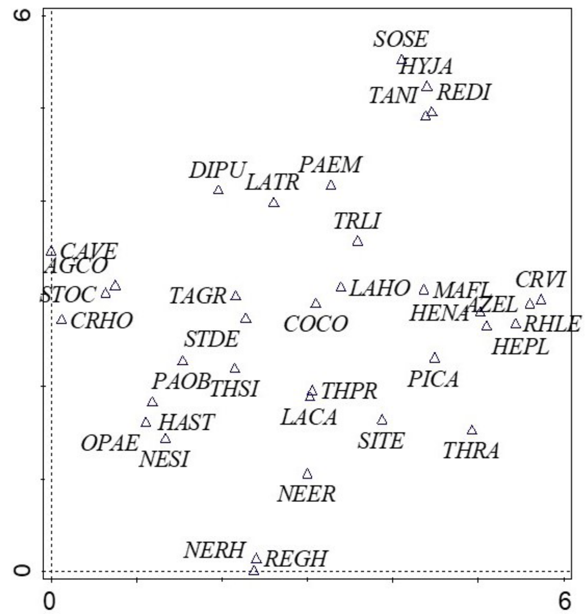

Figure 5. Ordination of snake scores based on weighted abundances of species at each sampling site. Species codes are defined in Appendix B.

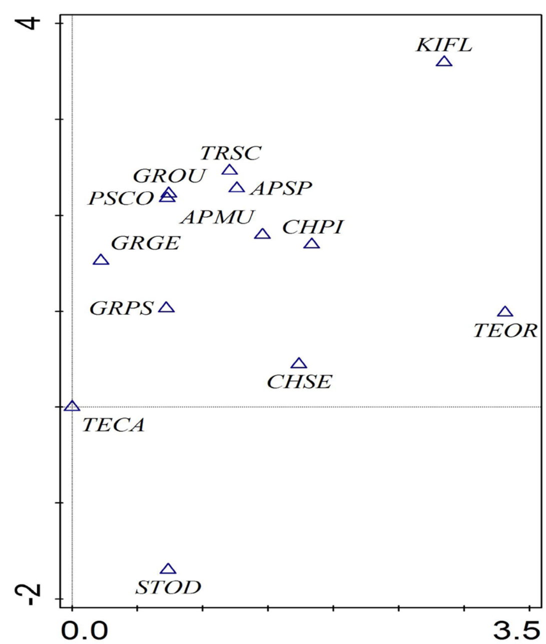

Figure 6. Ordination of turtle scores based on weighted abundances of species at each sampling site. Species codes are defined in Appendix B.

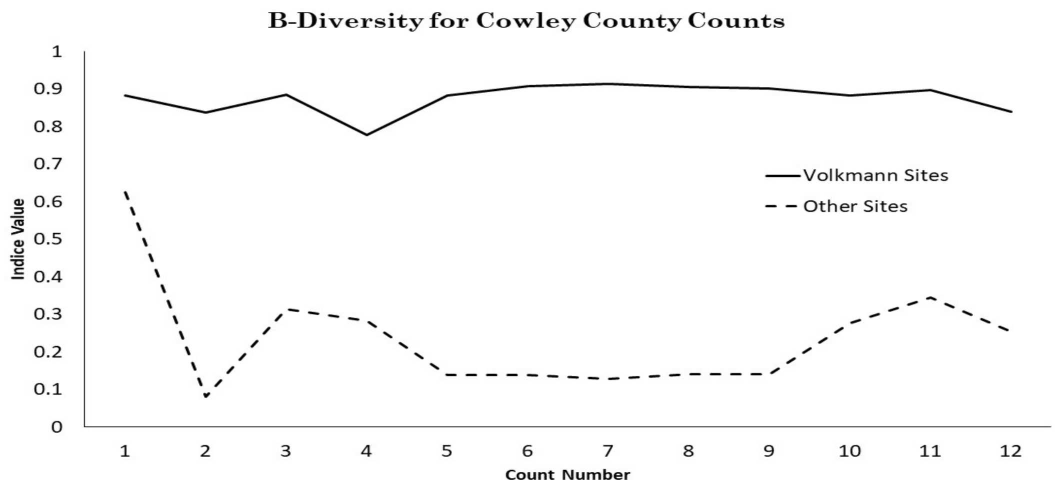

Figure 7. β-diversity values for Cowley County counts. Values were calculated between counts for common sites repeatedly sampled by Al Volkmann and crew, and between counts conducted by others in Cowley County.

Earless Lizards (*Holbrookia maculata*) were observed at more southerly sites.

Results within the snake ordination were similar to the lizard ordination in that the distribution of the species scores appear to be constrained to the southeastern to south-central part of the state (Fig. 5). There was an eastern contingent consisting of Western Worm Snake (*Carphophis vermis*), Red-bellied Snake (*Storeria occipitomaculata*), Copperhead (*Agkistrodon contortrix*), and Timber Rattlesnake (*Crotalus horridus*). The western assemblage was represented by Eastern Glossy Snake (*Arizona elegans*), Long-nosed Snake (*Rhinocheilus lecontei*), Both Eastern (*Heterodon platirhinos*) and Western (*H. nasicus*) Hog-nosed snakes, and the Prairie Rattlesnake (*C. viridis*). A south-central assemblage consisting of the New Mexico Threadsnake (*Rena dissecta*), Ground Snake (*Sonora semiannulata*), Chihuahuan Night Snake (*Hypsiglena jani*), and Plains Black-headed Snake (*Tantilla nigriceps*). The other snake species fell out between these three groups and represent a transition of species from eastern to west-central Kansas.

The gradients (represented by the axes in the graph) were considerably shorter for turtles than for the other taxa (Fig. 6). The basking turtles within the family Emydidae were mostly observed at sites in northeastern Kansas. Eastern Musk Turtles (*Sternotherus odoratus*) were observed more frequently at sites in southeastern Kansas. Not surprisingly, both Ornate Box Turtles (*Terrapene ornata*) and Yellow Mud Turtles (*Kinosternon flavescens*) were the more westerly occurring species.

Since the number of counts were low for most counties, I only calculated β-diversity indices for the ten counties with the most counts. Similarity was low to moderate between counts within counties (Table 1). The three counties with the highest values, or most similar abundances between counts, were Cowley, Linn, and Sumner. These higher index values were driven by multiple counts repeated at the same sites. Many of the Cowley counts for instance were organized and ran by Al Volkmann and involved repeated trips to the same sites at roughly the same time every year. When the Volkmann counts were separated from the other Cowley Counts, their similarity values were much higher than compared with Cowley counts not conducted by Volkmann (Fig. 7).

Discussion

Prior to this endeavor, only one other summary of Kansas herp counts has been published. Rundquist (1999) summarized just the spring herp counts and did not include any data from field trips prior to the 1989 initiation of the spring counts, or any counts outside of the April-May window. His summary included 309 counts in 60 counties. Cowley and Sumner

Table 1. Mean β-diversity values, standard error (SE) and range for the ten counties with the most counts.

County	# Counts	Mean Chao-Sorensen-Est	SE	Range
Barber	27	0.454	0.028	0.005-0.976
Bourbon	15	0.284	0.030	0-1.00
Cherokee	16	0.614	0.041	0.047-1.00
Cowley	28	0.733	0.020	0.078-1.00
Douglas	24	0.604	0.015	0-1.00
Elk	16	0.523	0.029	0-1.00
Linn	29	0.712	0.027	0.261-1.00
Russell	14	0.516	0.032	0-1.00
Shawnee	23	0.492	0.019	0-1.00
Sumner	23	0.722	0.018	0-1.00

County had the highest number of counts at 10. The High Plains were highly under-represented. Several supposedly common species were not observed as frequently as conventional wisdom might suggest. Rundquist (1999) also noted that variation in numbers of individuals observed most likely varied between years and counts depending on environmental conditions and observer experience. It is important to note that amphibians and reptiles do differ greatly in elusiveness and secludedness, which inherently leads to variation in detectability (Mazerolla et al. 2007). Ultimately though, it is difficult to make comparisons of species presence and abundance without repeated samples. Very few counties had repeated samples at common sites.

While for this manuscript I widened the scope of the counts that I included and of course increased the number of counts with time, there are still some similarities between my results and those of Rundquist (1999). Considering my first objective, "do count data provide useful information on distributional patterns of amphibians and reptiles in Kansas?", the answer is yes with one big caveat. The results are driven by where counts have occurred. Similar to Rundquist's earlier publication, western Kansas as a whole is highly underrepresented. As noted, distributional patterns of lizards, snakes, and turtles appear to be restricted to the eastern half of the state. The western extent of amphibian distributions appears to be mostly influenced by the high number of counts (12) in Logan County. Historically there has been considerable interest in *A. debilis* along the Smoky Hill River in this part of the state. The number of counts per county, particularly Barber, Linn, and Cherokee, were most likely influenced by the high number of unique herpetofauna that only occur in these regions of Kansas, and the number of people traveling there to observe them. Other counties with high numbers of counts, such as Douglas and Shawnee, were probably influenced by a higher density of KHS members residing there. Under-representation of counties in western Kansas could be due to low density of KHS members. Unfortunately, this spatial bias due to preferential sampling is a common one among citizen science projects (Robinson et al. 2017).

Biases aside, the citizen science data collected through the auspices of KHS have proven to be very valuable in understanding distribution and abundance of amphibians and reptiles in the state. I propose to reinitiate the standardized herp counts in Kansas to maintain these data collection activities and continue to the important legacy set forth by KHS. Minor tweaks and suggestions to protocol include:

- Counts can take place any time of year
- Pick sites that can be repeatedly surveyed at the same time every year
- Provide GPS points for sample sites.
- When possible sample sites in under-sampled counties

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Appendix A. Total number of KHS field trips and herp counts by county

County	Number of Counts	County	Number of Counts
Allen	1	Linn	29
Anderson	4	Logan	12
Atchison	5	Lyon	7
Barber	27	Marion	1
Barton	6	Marshall	2
Bourbon	15	McPherson	2
Brown	1	Meade	3
Butler	5	Miami	7
Chase	8	Mitchell	0
Chautauqua	8	Montgomery	6
Cherokee	16	Morris	2
Cheyenne	1	Morton	2
Clark	10	Nemaha	0
Clay	1	Neosho	2
Cloud	0	Ness	0
Coffey	4	Norton	1
Comanche	2	Osage	13
Cowley	28	Osborne	0
Crawford	6	Ottawa	0
Decatur	0	Pawnee	0
Dickinson	0	Phillips	0
Doniphan	1	Pottawatomie	5
Douglas	24	Pratt	2
Edwards	0	Rawlins	0
Elk	16	Reno	1
Ellis	9	Republic	0
Ellsworth	4	Rice	0
Finney	1	Riley	11
Ford	2	Rooks	2
Franklin	2	Rush	1
Geary	2	Russell	14
Gove	1	Saline	0
Graham	2	Scott	3
Grant	5	Sedgwick	5
Gray	0	Seward	2
Greeley	0	Shawnee	23
Greenwood	1	Sheridan	2
Hamilton	1	Sherman	0
Harper	2	Smith	1
Harvey	3	Stafford	9
Haskell	3	Stanton	0
Hodgeman	1	Stevens	1
Jackson	0	Sumner	23
Jefferson	3	Thomas	0
Jewell	3	Trego	2
Johnson	8	Wabaunsee	10
Kearny	0	Wallace	1
Kingman	0	Washington	3
Kiowa	3	Wichita	1
Labette	2	Wilson	1
Lane	0	Woodson	3
Leavenworth	4	Wyandotte	3
Lincoln	2		

Appendix B. Four letter species codes used in ordination figures

Species Code	Scientific Name	Common Name	Total
		Salamanders	
AMMA	*Ambystoma mavortium*	Barred Tiger Salamander	263
AMTE	*Ambystoma texanum*	Smallmouth Salamander	95
AMTI	*Ambystoma tigrinum*	Eastern Tiger Salamander	1
NOVI	*Notopthalmus viridescens*	Eastern Newt	64
EULO	*Eurycea longicauda*	Longtail Salamander	100
EULU	*Eurycea lucifuga*	Cave Salamander	77
EUSP	*Eurycea spelaea*	Grotto Salamander	24
		Frogs and Toads	
ANAM	*Anaxyrus americanus*	American Toad	943
ANCO	*Anaxyrus cognatus*	Great Plains Toad	1,070
ANDE	*Anaxyrus debilis*	Green Toad	305
ANFO	*Anaxyrus fowleri*	Fowler's Toad	9
ANPU	*Anaxyrus punctatus*	Red-spotted Toad	23
ANWO	*Anaxyrus woodhousii*	Woodhouse's Toad	1846
ACBL	*Acris blanchardi*	Blanchard's Cricket Frog	13,616
HYLA	*Hyla chrysoscelis/versicolor*	Gray Treefrog	888
PSCL	*Pseudacris clarkii*	Spotted Chorus Frog	1,039
PSCR	*Pseudacris crucifer*	Spring Peeper	262
PSMA	*Pseudacris maculata*	Boreal Chorus Frog	4,378
PSST	*Pseudacris streckeri*	Streckers Chorus Frog	65
GACA	*Gastrophryne carolinensis*	Eastern Narrowmouth Toad	10
GAOL	*Gastrophryne olivacea*	Plains Narrowmouth Toad	1,361
LIAR	*Lithobates areolatus*	Crawfish Frog	72
LIBL	*Lithobates blairi*	Plains Leopard Frog	3,502
LICA	*Lithobates catesbeianus*	Bullfrog	2,184
LICL	*Lithobates clamitans*	Green Frog	20
LISP	*Lithobates sphenocephalus*	Southern Leopard Frog	2,265
SPBO	*Spea bombifrons*	Plains Spadefoot	3,122
		Lizards	
OPAT	*Ophisaurus attenuatus*	Western Slender Glass Lizard	332
CRCO	*Crotaphytus collaris*	Eastern Collared Lizard	2,243
HETU	*Hemidactylus turcicus*	Mediterranean Gecko	12
HOMA	*Holbrookia maculata*	Lesser Earless Lizard	245
PHCO	*Phrynosoma cornutum*	Texas Horned Lizard	292
PLAN	*Plestiodon anthracinus*	Coal Skink	13
PLFA	*Plestiodon fasciatus*	Five-lined Skink	536
PLLA	*Plestiodon laticeps*	Broadhead Skink	19
PLOB	*Plestiodon obsoletus*	Great Plains Skink	2,930
PLOBt	*Plestiodon obtusirostris*	Southern Prairie Skink	122
PLSE	*Plestiodon septentrionalis*	Northern Prairie Skink	197
SCLA	*Scincella lateralis*	Ground Skink	314
ASSE	*Aspidoscelis sexlineata*	Six-lined Racerunner	1,319
		Snakes	
AZEL	*Arizona elegans*	Eastern Glossy Snake	38
COCO	*Coluber constrictor*	Eastern Racer	919
MAFL	*Masticophis flagellum*	Coachwhip	198
LACA	*Lampropeltis calligaster*	Prairie Kingsnake	186
LAHO	*Lampropeltis holbrookia*	Speckled Kingsnake	440
LATR	*Lampropeltis triangulum*	Milk Snake	577

Appendix B. Cont.

Species Code	Scientific Name	Common Name	Total
OPAE	*Opheodrys aestivus*	Rough Green Snake	70
PAEM	*Pantherophis emoryi*	Great Plains Rat Snake	511
PLOB	*Pantherophis obsoletus*	Western Rat Snake	374
PICA	*Pituophis catenifer*	Gopher Snake	342
RHLE	*Rhinocheilus lecontei*	Longnosed Snake	24
SOSE	*Sonora semiannulata*	Ground Snake	991
TAGR	*Tantilla gracilis*	Flathead Snake	1,585
TANI	*Tantilla nigriceps*	Plains Blackhead Snake	239
AGCO	*Agkistrodon contortrix*	Copperhead	247
CRHO	*Crotalus horridus*	Timber Rattlesnake	109
CRVI	*Crotalus viridis*	Prairie Rattlesnake	137
SITE	*Sistrurus tergminus*	Massasauga	202
CAVE	*Carphophis vermis*	Western Worm Snake	227
DIPU	*Diadophis punctatus*	Ringneck Snake	13,906
HENA	*Heterodon nasicus*	Western Hognose Snake	24
HEPL	*Heterodon platirhinos*	Eastern Hognose Snake	17
HYJA	*Hypsiglena jani*	Chihuahuan Night Snake	130
REDI	*Rena dissecta*	New Mexico Blind Snake	157
HAST	*Haldea striatula*	Rough Earth Snake	27
NEER	*Nerodia erythrogaster*	Plainbelly Water Snake	304
NERH	*Nerodia rhombifer*	Diamondback Water Snake	146
NESI	*Nerodia sipedon*	Northern Water Snake	310
REGH	*Regina grahamii*	Graham's Crayfish Snake	40
STDE	*Storeria dekayi*	Brown Snake	126
STOC	*Storeria occipitomaculata*	Redbelly Snake	6
THMA	*Thamnophis marcianus*	Checkered Garter Snake	1
THPR	*Thamnophis proximus*	Western Ribbon Snake	222
THRA	*Thamnophis radix*	Plains Garter Snake	80
THIS	*Thamnophis sirtalis*	Common Garter Snake	726
TRLI	*Tropidoclonion lineatum*	Lined Snake	442
VIVA	*Virginia valeriae*	Smooth Earth Snake	5
		Turtles	
CHSE	*Chelydra serpentine*	Common Snapping Turtle	185
CHPI	*Chrysemys picta*	Northern Painted Turtle	800
GRGE	*Graptemys geographica*	Common Map Turtle	8
GROU	*Graptemys ouachitensis*	Ouachita Map Turtle	34
GRPS	*Graptemys pseudogeographica*	False Map Turtle	53
PSCO	*Pseudemys concinna*	River Cooter	17
TECA	*Terrapene carolina*	Eastern Box Turtle	187
TEOR	*Terrapene ornate*	Ornate Box Turtle	816
TRSC	*Trachemys scripta*	Slider	913
KIFL	*Kinosternon flavescens*	Yellow Mud Turtle	119
STOD	*Sternotherus odoratus*	Common Musk Turtle	20
APMU	*Apalone mutica*	Smooth Softshell	9
APSP	*Apalone spinifera*	Spiny Softshell	76

A Successional Response to Canopy Development by Anoles at the Doc Thomas House, Miami, Florida

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ABSTRACT

A visual encounter herpetofaunal survey was conducted on the grounds of the Doc Thomas House in South Miami, Miami-Dade County, Florida, on 5 September 2019. Findings were compared with a survey conducted at this site during 1997–1998. Timed searches within each of the studies provided comparisons of assemblage structure and relative abundances of *Anolis* species. The most striking change evident in this study was the appearance of the Puerto Rican Crested Anole, *A. cristatellus*, which nearly replaced the Cuban Brown Anole, *A. sagrei*, once the dominant anole at this site. Although *A. cristatellus* was encountered at similar rates as *A. sagrei* had been 22 years earlier, it comprised a greater percentage of individuals relative to the anoline assemblage than did *A. sagrei*, indicating fewer individuals of other congeners in 2019 than during 1997–1998. Increased canopy development since Hurricane Andrew in 1992 in tandem with planting of native flora best explains the change in Anolis species succession, with most of the few *A. sagrei* having been found along the sunny entrance fence. Ever in a state of flux, differences in canopy cover can be expected to bring concomitant changes in species for which shade is an important habitat feature.

INTRODUCTION

The Doc Thomas House (Figure 1) is 1.2 ha parcel of remnant rockland pine/tropical hardwood hammock with the home of the late Arden Hayes Thomas, Jr., that was built in 1931. In December 1974, one year before his death, Doc Thomas donated his house and property to the Tropical Audubon Society (TAS) for education and conservation. Soon thereafter, the house became the headquarter for TAS. The surrounding property is the Steinberg Na-

Figure 1. The main entrance to the Doc Thomas House, South Miami, Miami-Dade County, Florida. 5 September 2019. Photograph by W.E. Meshaka, Jr.

Figure 2. A view of the main trail behind the Doc Tomas House in South Miami, Miami-Dade County, Florida. 5 September 2019. Photograph by W.E. Meshaka, Jr.

ture Center. Beginning in the early 1990s, the DTH underwent habitat restoration to restore native flora with some exceptions for historical reasons. In 1992, the DTH experienced effects of Hurricane Andrew. During 1997–1998, fieldwork, including systematic counts of anoles, was conducted that resulted in a species list of the amphibians and reptiles of the DTH (Meshaka, 1999a). In this setting, surrounded by urban south Miami, three amphibian and 10 reptile species were detected, only three of which were native species (Meshaka, 1999a). Twenty-seven years later, the DTH is heavily-canopied (Figure 2). After a brief visit to the DTH 14 March 2019, I determined that a visit in which parts of Meshaka's (1999a) methods could be repeated could measure some aspects of herpetofaunal succession in habitat structurally very different than it was more than 20 years ago.

MATERIALS AND METHODS

Two separate visits were made to the DTH on 5 September 2019. Timed surveys at four sites during 1127–1250 hrs comprised the first visit. The exterior wall of the house, inside screened porch, and vegetation to 1 m from the building were searched once beginning at the main entrance to the porch during 1127–1140 hrs. The main trail which began behind the house was searched during 1143–1209 hrs. This trail was walked southward directly to the chickee, then continuously to a dead-end at the jakes. Without searching again, I walked back to just past the chickee and turned right along a path which I searched for the first time that circled back to the main entrance to the trail. The trail was searched to 2 m from either side of the middle of the trail. During 1216–1237 hrs, I searched the remaining area north of the Main Trail area, the line of which is made of a stone wall and large Banyon tree. The search area included the adjacent parking lot, Pine Trail, and Hammock Trail. An open cultivated interior portion of the north-facing chain-link fence along Sunset Drive was searched during 1245–1250 hrs to the point at which vegetation precluded search. Anoles were identified to species, sex, and size-class. Juveniles were overwhelmingly young-of-the-year and easily identified. Unknown individuals were most likely females and sub-adults of either sex not close enough to verify category. Perch heights, like those of Meshaka (1999a) were categorized as 0-60 cm, 60-105 cm, 105-180 cm, and +180 cm.

The second visit took place during 2007–2031 hrs. Timed surveys were made at two areas during that evening. The first survey comprised one walk around the house during 2007–2011 hrs. A single porch light illuminated a small section of the building. The second survey comprised a search during 2014–2031 hrs of all remaining property visited earlier that day. Comparisons of my timed surveys were made with those of Meshaka (1999a) on 8 August 1997 during 1030–1105 hrs and a single nocturnal visit in April 1998.

RESULTS AND DISCUSSION

Five species were detected on 5 September 2019. A Greenhouse Frog was uncovered from a board while searching the general area during 1216–1237 hrs. At night, two adults were seen hopping about, and others were heard calling also in the general area during 2014–2031 hrs. The Wood Slave, *Hemidactylus mabouia*, was detected at night: one young adult on the east side of the house close to the ground and well away from the single porch light. A second young adult was found at the south end of the property on an unlit outbuilding. Anoles were detected during the day. The Puerto Rican Crested Anole, *Anolis cristatellus* (Figure 3a,b,c), was detected at all sites, the Bark Anole, *A. distichus*, was detected along the Main Trail. The Cuban Green Anole, *A. porcatus* (Figure 4), was detected on the sunny aspects of the house and on the sunny entrance fence, and the Brown Anole, *A. sagrei* (Figure 5), was detected at sites exclusive of the Main Trail. All aforementioned species, excepting *A. cristatellus*, were found in Meshaka's (1999a) study. Among the anoles missing from Meshaka's (1999a) study was the Knight Anole, *A. equestris*, despite sultry and warm conditions. However, it rained lightly but steadily during the first 10 minutes of my survey, which I have found subsequently hinders display and movements in this species. Other species reported by Meshaka (1999a) but not encountered in this study were the Everglades Racer, *Coluber constrictor paludicola*, Southern Ring-necked Snake, *Diadophis punctatus punctatus*, the Braminy Blindsnake, *Indotyphlops braminus*, the Rough Greensnake, *Opheodrys aestivus*, Cuban Treefrog, *Osteopilus septentrionalis*, and Cane Toad, *Rhinella marina*. Despite the brevity of my visit in this study, I am surprised that I did not see or hear *O.*

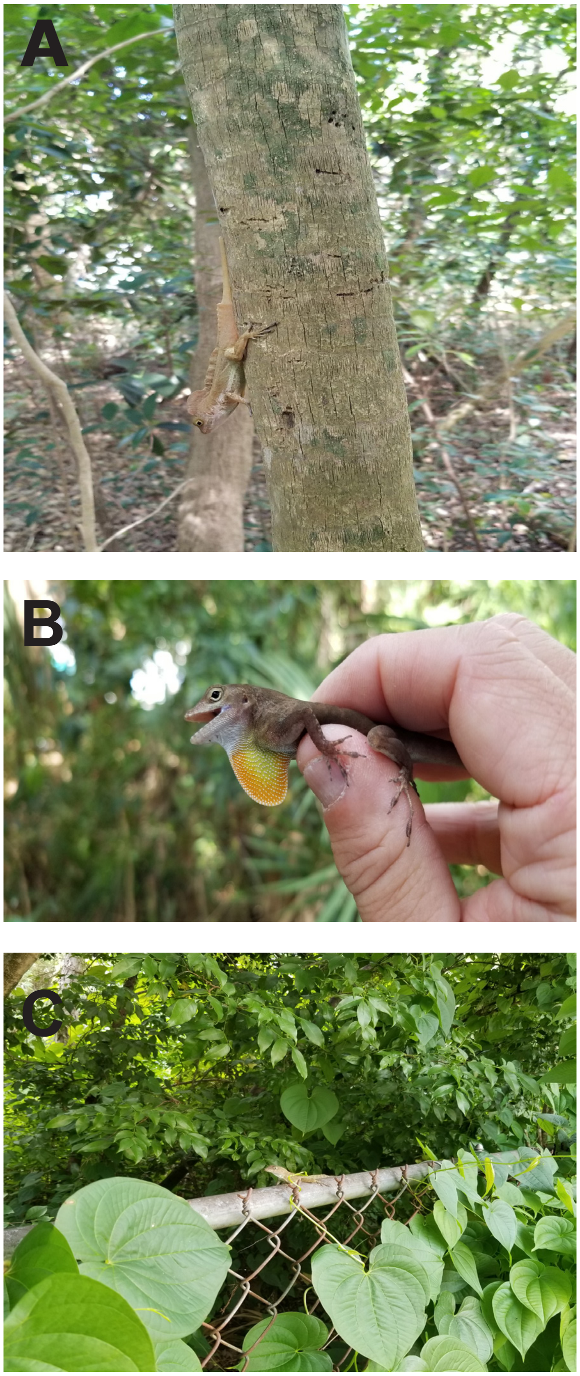

Figure 3. The Puerto Rican Crested Anole, *Anolis cristatellus*. A territorial male (A). A male with a distended dewlap (B). A male resting on fence in the shade (C). The Doc Thomas House, South Miami, Miami-Dade County, Florida. 14 March 2019. (A and B). 5 September 2019 (C). Photographs by W.E. Meshaka, Jr.

Figure 4. A male Cuban Green Anole, *Anolis porcatus*, established at the Doc Thomas House, South Miami, Miami-Dade County, Florida. 5 September 2019. Note blue scapular ocellus and lateral chain of blue dots. Photograph by W.E. Meshaka, Jr.

Figure 5. A male Brown Anole, *Anolis sagrei*, perched along the sunniest portion of the Doc Thomas House, South Miami, Miami-Dade County, Florida. 5 September 2019. Photograph by W.E. Meshaka, Jr.

septentrionalis or see *R. marina*. The status of these undetected species remains to be seen.

The Anolis species established in Florida can lend themselves well to visual encounter surveys in light of their frequently conspicuous behaviors and bright dewlaps. Consequently, assemblage structure could be approximated and compared between the survey conducted in this study in September with that conducted in August 1997 during overlapping times of the day (Meshaka, 1999a). Assemblage structure for the property as a whole was highly uneven during both studies, but more so in 2019 with *A. cristatellus* comprising 89.8% of the assemblage as compared to 77.5% by *A. sagrei* did in 1997 (Table 1). Within the mostly shaded property in 2019, *A. cristatellus* was likewise nearly exclusive in its presence but outnumbered 5:1 by *A. sagrei* on the perpetually sunny portion of the entrance fence (Table 1).

Captures per unit time were high for all lizards combined in 2019 (1.97 individuals/ min.) and in 1997 (2.54 individuals/ min.) (Meshaka, 1999a). Capture rates were also high for the dominant species of each study: *A. cristatellus* (1.77) in this study and *A. sagrei* (1.97) in 1997 (Meshaka, 1999a). A comparison of assemblage structure and observation rates between studies suggests that *A. cristatellus* dominated more so over fewer other lizards than did *A. sagrei* in 1997 (Meshaka, 1999a). Among species between time periods, the decreased capture rates between 1997 and 2019, respectively, were greater in *A. sagrei* (1.97, 0.11), a 17.9-fold decrease, than *A. distichus* (0.26, 0.03) and *A. porcatus* (0.14, 0.06). In light of rainfall as a potential hindrance to activity, I cannot rule out presence of *A. equestris* (0.17, 0.00?).

Among sites in 2019, captures/ min. for *A. cristatellus* were highest along the Main Trail (2.3), the shadiest section, and lowest along the fence (0.2), the sunniest. Intermediate in shade and no. observations/ min. were intermediate on the general property (1.8) and the house (1.4). The extent of shade present at the DTH in 2019 brought with it conditions far more amenable to this species, known to excel in shady conditions as compared to open habitat associated with *A. sagrei* (Meshaka et al., 2004, 2008a). The close association of *A. cristatellus* with extensive shade is also not shared by other potential predatory and competitive congeners, *A. equestris* and *A. porcatus*, or by *A. distichus* (Meshaka, 2011; Meshaka et al., 2004), even if not to the extent of *A. sagrei*, which could explain the greater abundance of those three species in 1997 (Meshaka, 1999a). To that end, I wonder if capture rate of *A. sagrei* in 1997 (Meshaka, 1999a) would have been higher if not for the presence of its fellow Cuban congeneric predators and competitors.

Niche overlap in perch height overwhelmingly places *A. cristatellus* in direct contact with *A. sagrei* (Salzburg, 1984; Meshaka, 1999a,b; Meshaka et al., 2004, 2008a,b; Table 2) over which it is socially dominant (Salzburg, 1984). To that end, *A. sagrei* is scarce if present with *A. cristatellus* (Brach, 1977). Thus, *A. cristatellus* at DTH in 2019 experienced advantages with respect to habitat preference and behavior towards the marginally syntopic and ecologically similar *A. sagrei*. Among the other anoles, especially *A. equestris* and *A. porcatus*, reduced numbers in 2019 presumably result in less potential for negative impact on *A. cristatellus* in 2019 and perhaps less so than *A. sagrei* in 1997 (Meshaka, 1999a).

By 2019, the DTH had passed a tipping point in habitat suitability strongly favor-

Table 1. Assemblage structure of *Anolis* species as a percentage (%) of each species of total number of lizards from each site at the Doc Thomas House, South Miami, Miami-Dade County, Florida, on 5 September 2019 and 8 August 1997 (Meshaka, 1999).

Species	House	Main Trail	General property	Fence	Combined sites	1997
Anolis cristatellus	90.0	96.7	97.4	11.1	89.8	0.00
A. distichus	0.0	3.3	0.0	0.0	1.6	10.1
A. equestris	0.0	0.0	0.0	0.0	0.0	6.7
A. porcatus	5.0	0.0	0.0	33.3	3.1	5.6
A. sagrei	5.0	0.0	2.6	55.6	5.5	77.5
Total	20	61	38	9	128	89

Table 2. Perch heights of *Anolis* species as a percentage (%) of each sex by species of total number of lizards observed at the Doc Thomas House, South Miami, Miami-Dade County, Florida, on 5 September 2019.

	A. cristatellus					*A. distichus*	*A. porcatus*			*A. sagrei*			
Height (cm)	Male	Female	Juvenile	Unknown	Total	Adult	Male	Juvenile	Unknown	Male	Female	Juvenile	Total
0-60	38.5	25.0	64.7	35.3	44.3	0.0	0.0	0.0	0.0	33.3	66.7	100.0	57.1
60-105	23.1	41.7	26.5	23.5	26.1	0.0	0.0	100.0	0.0	33.3	33.3	0.0	28.6
105-180	28.8	25.0	8.8	23.5	21.7	50.0	100.0	0.0	100.0	33.3	0.0	0.0	14.3
+180	9.6	8.3	0.0	17.6	7.8	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100
N	52	12	34	17	115	2	1	2	1	3	3	1	7

ing a robust population of *A. cristatellus* at a concomitant disadvantage being greatest to its ecologically most similar and nearest relative on the site, *A. sagrei*. Habitat succession-driven changes in the anoline assemblage at the DTH may ultimately prove to be a rare phenomenon in southern Florida. Historically tied to hurricanes, *A. sagrei* benefited by the clearing of vegetation and creation of habitat by windblown piles of vegetation from Hurricane Andrew (Meshaka, 1993). If the increase in frequency and power of hurricanes continues associated with climate change, the DTH in particular and urban south Florida generally can expecte *A. cristatellus* to occur on the fringes of an anoline assemblage closer in appearance to that of the DTH of the mid-199os.

Acknowledgements: I would like to thank Amy Creekmur of Tropical Audubon Society for her professional kindness associated with this project. This work is humbly dedicated to the memory of the late Arden Hayes "Doc" Thomas, Jr., for his contributions to South Miami and donation of his property "s*o that future generations may observe a sample of the original terrain, flora, avifauna and forest of Early Dade County.*"

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About the Kansas Herpetological Society

The KHS is a non-profit organization established in 1974 and designed to encourage education and dissemination of scientific information through the facilities of the Society; to encourage conservation of wildlife in general and of the herpetofauna of Kansas in particular; and to achieve closer cooperation and understanding between herpetologists, so that they may work together in common cause. All interested persons are invited to become members of the Society. Membership dues per calendar year are $15.00 (U.S., Regular), $20.00 (outside North America, Regular), and $20.00
(Contributing) payable to the KHS. Send all dues to: KHS Secretary, (address inside the front cover)

KHS Meetings
The KHS holds an annual meeting in the fall of each year. The meeting is, minimally, a two day event with lectures and presentations by herpetologists. All interested individuals are invited to make presentations. The annual meeting is also the time of the Saturday night social and fund-raising auction.

Field Trips
The KHS hosts three field trips each year, one each in the spring, summer, and fall. Field trips are an enjoyable educational experience for everyone, and also serve to broaden our collective understanding of the distribution and abundance of the amphibians, reptiles, and turtles in Kansas. All interested persons are invited to attend.

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As space allows, *Collinsorum* publishes all manner of news, notes, and articles. Priority of publishing is given to submissions of Kansas herpetological subjects and by KHS members; however all submissions are welcome. The ultimate decision concerning the publication of a manuscript is at the discretion of the Editor. Manuscripts should be submitted to the Editor in an electronic format whenever possible. Those manuscripts submitted in hard copy may be delayed in date of publication. Manuscripts should be submitted to the Editor no later than the 1st of the month prior to the month of issuance. All manuscripts become the sole possession of the Society, and will not be returned unless arrangements are made with the Editor.

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Bronze Salamander Award
Established in 1987, this Award is presented to those individuals whose efforts and dedication to the Kansas Herpetological Society go far beyond the normal bounds. The recipients of this Award have given exemplary service to the KHS, and are presented with an elegant bronze sculpture of a Barred Tiger Salamander.

The Howard K. Gloyd - Edward H. Taylor Scholarship
Established in 1993, The Gloyd-Taylor Scholarship is presented annually by the Kansas Herpetological Society to an outstanding herpetology student. The scholarship is a minimum of $300.00 and is awarded on the basis of potential for contributing to the science of herpetology. Students from grade school through university are eligible.

The Alan H. Kamb Grant for Research on Kansas Snakes
KHS members only are eligible to apply for The Alan H. Kamb Grant for Research on Kansas Snakes, which was established in 2001. The recipient of the grant will be selected by the KHS Awards Committee. A minimum award of $300 is given annually. Research results (in whole or in part) must be submitted for publication in Collinsorum.

The Henry S. Fitch - Dwight R. Platt Award for Excellence in Field Herpetology
KHS members only are eligible to apply for The Henry S. Fitch - Dwight R. Platt Award for Excellence in Field Herpetology, which was established in 2010. The recipient of the grant will be selected by the KHS Awards Committee. The award will be given annually when sufficient funds have been raised to establish a trust.

The George Toland Award for Ecological Research on North American Herpetofauna
This CNAH Award was established in 2008 in recognition of the scientific career of George Fredrick Toland, whose life-long interest in herpetology was passed on to so many of his students. The recipient of this award will be selected by the KHS Awards Committee. A minimum award of $200 is given annually at the end of the KHS meeting. Research results (in whole or in part) must be submitted for publication in Collinsorum.

The Suzanne L. & Joseph T. Collins Award for Excellence in Kansas Herpetology
This CNAH Award was established by Westar Energy in 1998 in recognition of the achievements of Suzanne L. Collins and Joseph T. Collins. In even years, the Award is bestowed upon an individual who, in the preceding two calendar years, had published a paper of academic excellence on native species of Kansas amphibians, reptiles, and/or turtles, and in odd years, the Award is given to an individual who, in a juried competition, took the best photograph of an amphibian, reptile, or turtle representing a species native to Kansas. The Collins Award is minimally $1,000.00, and is neither a grant nor a scholarship. No nominations or applications can be made for it.

Kansas Herpetological Society
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