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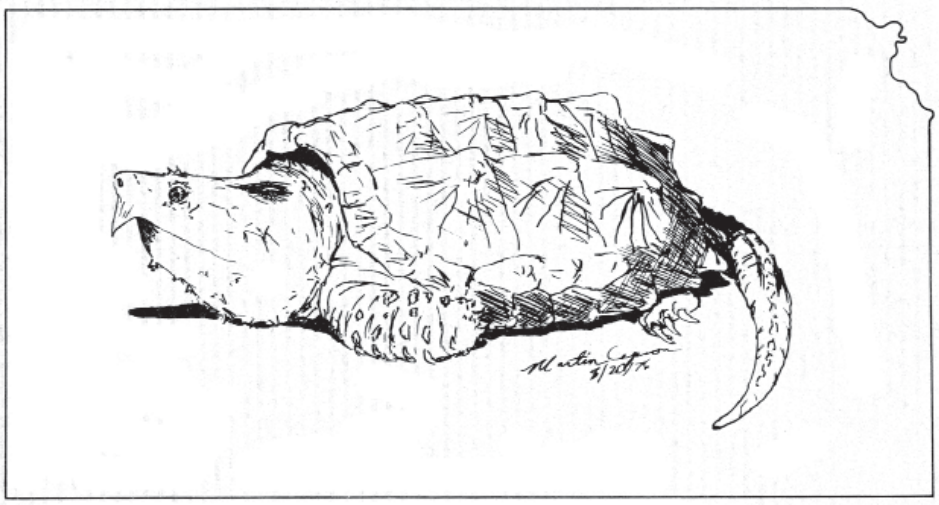

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Front Cover: Alligator Snapping Turtle (*Macrochelys temminckii*) by Marty Capron.

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NOTES

Cope's Gray Treefrog (*Hyla chrysoscelis*) along the Platte River, Hall County, Nebraska

Cope's Gray Treefrog (*Hyla chrysoscelis*) occurs almost continuously in southeastern parts of Nebraska and in a few isolated counties to the north and west (Fogell, 2010). Specifically, disjunct populations were documented from Hall, Knox, and Lincoln counties (USGS National Amphibian Atlas, 2014; Ballenger et al., 2010; Fogell, 2010). Latter records were thought to be in response to recent increases in tree density and suitable habitat along river valleys (see Johnson, 1994). The suspected westward expansion of Cope's Gray Treefrog in the state along rivers (Fogell, 2010) also has been documented with other species, such as the Eastern Wood Rat (*Neotoma floridana*), Eastern Fox Squirrel (*Sciurus niger*), White-footed Mouse (*Peromyscus leucopus*), Northern Cardinal (*Cardinalis cardinalis*), and Evening Bat (*Nycticeius humeralis*; Jones, 1964; Ducey, 1989; Benedict et al., 2000; Geluso et al., 2008; Serbousek and Geluso, 2009; Graham et al., 2012). Today, little is known regarding the occurrences of Cope's Gray Treefrog beyond southeastern Nebraska. In fact, Fogell (2010) suspected that those in Lincoln County might be the result of an introduction whereas those in Knox County are probably naturally occurring. It is unclear whether individuals from Hall County represent a recent expansion in geographic distribution, an introduced population, or an isolated population linked with wooded island habitats along the Platte River that date back to the 1800s (see Johnson, 1994). To that end, this area in Hall County also contains an isolated, disjunct population of another woodland herpetofauna, the Redbelly Snake (*Storeria occipitomaculata*; Geluso and Harner, 2013). Herein, we report additional observations of Cope's Gray Treefrogs in Hall County, Nebraska.

On 25 June 2014, during an anuran call survey, we heard and then photographed a Cope's Gray Treefrog (Figure 1) at 23:20 CST (40.78791, -98.46406; WGS 84). The temperature was 23°C with 73% humidity, clear skies, and light wind. The individual was observed 260 m from the closest gallery of trees and approximately 500 m from the nearest active channel of the Platte River atop a stalk of Smooth Brome (*Bromus inermis*). The immediate area consisted of two small reclaimed sandpits (24 and 37 m away) surrounded by tallgrass prairie of primarily Prairie Cordgrass (*Spartina pectinata*), Switchgrass (*Panicum virgatum*), Reed Canary (*Phalaris arundinacea*), and various forbs. Other call surveys were carried out throughout the summer of 2014 using a recording of a Cope's Gray Treefrog call, which was played from an iPhone© on Shoemaker

Figure 1. Cope's Gray Treefrog (*Hyla chrysoscelis*) observed in Hall County, Nebraska, on 25 June 2014.

Island and another Crane Trust property farther west in Buffalo County, Nebraska. Those surveys yielded additional call backs from more males on Shoemaker Island in a row of Roughleaf Dogwood (*Cornus drummondii*), 7 m wide and 2 m tall, with Wild Grapevines (*Vitis vinifera*; 40.78058, -98.48376; WGS 84, 30 July 2014). Dogwoods were bordered to the north by an irrigated cornfield whereas a large, expansive sandpit lake was about 80 m to the south. The area between the dogwoods and the lake contained mainly Reed Canary (*P. arundinacea*), Indiangrass (*Sorghastrum nutans*), and Big Bluestem (*Andropogon gerardii*) with a few scattered mature Plains Cottonwoods (*Populus deltoides*).

Previously, only one account of Cope's Gray Treefrog had been documented in Hall County near Doniphan in June 1978 (UNSM ZM-7806). The museum account of this specimen does not include any habitat details or an exact location. Initial research conducted over 30 years ago determined that the adjacent Mormon Island could be suitable habitat for treefrogs, but none was detected during extensive surveys (Ballinger, 1980; Jones et al., 1981). More recently (June 2009-November 2010) another survey of herpetofauna was conducted on both Mormon Island and Shoemaker Island by checking coverboards, forest debris, drift fence/funnel traps arrays, as well as observations made during bird surveys and other field activities. That survey revealed five previously undetected herpetofaunal species but did not include Cope's Gray Treefrog (Geluso and Harner, 2013). Our observation of Cope's Gray Treefrogs on Shoemaker Island in Hall County adds an additional species to the conservation area. We accumulated 30 man-hours during six nights of searching for treefrogs, most of which took place on Shoemaker Island. We usually selected nights with higher humidity, often before or after rain.

Cope's Gray Treefrog is one of many anurans that generally requires adequate terrestrial habitat alongside water resources for sustainable populations (Pittman et al., 2008). They are also highly arboreal, although in Wisconsin, populations are known to inhabit more grassland habitats especially at the western periphery of its range (Jaslow and Vogt, 1977). This species shows high site fidelity compared to others in the same genus and is unlikely to disperse during or even after reproduction (Pittman et al., 2008). We suspect our observations likely reflect a small but resident population of Cope's Gray Treefrogs established within the mosaic of grassland and riparian habitats on Shoemaker Island. The island is managed for migrating cranes (*Grus canadensis*, *G. americana*), and Cope's Gray Treefrog could serve as potential prey for migrating cranes, as do other anurans. Geluso et al. (2013) reported that Plains Leopard Frogs (*Lithobates blairi*) were eaten by migratory Whooping Cranes in Nebraska, and they proposed that frogs were a larger part of the Whooping Crane's diet during migration than previously understood. The Boreal Chorus Frog (*Pseudacris maculata*) might be the most commonly consumed amphibian species by migrating cranes, in light of its abundance and early spring phenology (Ballinger, 1980). Cope's Gray Treefrog also emerges in spring with breeding beginning in April (Fogell, 2010), and our data indicate that the species uses habitats commonly frequented by cranes along the central Platte River. Moreover, males will call from the ground near ephemeral bodies of water or in the middle of a flooded field during mating season (Ballinger et al., 2010), which could provide cranes with a potential food source during migration.

More research along the lower Platte River is needed to determine whether observations in Hall County represent an isolated remnant population or the westward leading edge of an expanding eastern population. We hope our observation will facilitate others to better understand the occurrence of Cope's Gray Treefrog in central and western parts of Nebraska along river systems, where the species is likely more widespread in distribution than currently recognized.

ACKNOWLEDGMENTS

We thank Thomas E. Labedz (Collections Manager, University of Nebraska State Museum) for proving information on the original Cope's Gray Treefrog specimen from Hall County (UNSM ZM-7806); we thank J.M. Weidler, Ryan Joe, and Jennifer Janes for assistance in the field; and we thank W. Meshaka (State Museum of Pennsylvania) for comments on an earlier version of this manuscript. Funding for research came from Nebraska Environmental Trust REACH Grant #13-171-2. We also thank the Crane Trust for access to lands and logistical support during our surveys.

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Herpetological (Frog and Turtle) Inventories along the Missouri River in Kansas

INTRODUCTION

The U.S. Army Corps of Engineers (USACE) is administering the Missouri River Recovery Program (MRRP). The MRRP was originally authorized by congress in 1986 and expanded in 1999 as the Missouri River Fish and Wildlife Mitigation Project and was to mitigate for the habitat losses created by the Bank Stabilization and Navigation Project on the Missouri River in the states of Missouri, Kansas, Iowa, and Nebraska. The intent of the authorizations were for USACE to restore 166,750 acres of wildlife habitat to the Missouri River floodplain, to mitigate for the estimated 522,000 acres that were lost due to USACE actions as part of the Bank Stabilization and Navigation Project.

Amphibians utilize both wetland and upland habitats in their lifecycle. This fact made them good indicators for overall restoration efforts on MRRP lands. So amphibian species richness became one measure by which success for both wetland and upland habitat creation projects could be determined and as a tool to differentiate between the habitat features created. Turtle richness was used to further corroborate the determinations of success as a whole and between habitat features.

METHODS

Site Descriptions — There are currently five Recovery properties located in Kansas, at the time of survey initiation there were four. Three properties were selected in Kansas for study. These were Benedictine Bottoms (Benedictine), Dalbey Bottoms (Dalbey), and Elwood Bottoms (Elwood). Benedictine is approximately 2,100 acres of habitat. The area is comprised of 510 acres of riparian forest willow and cottonwood, 791 acres of grassland, 438 acres of wetland, and 360 acres of shrubland, drainage ditches, and levees. Dalbey is 1,597 acres of floodplain habitat that was mostly in agriculture at the start of the survey but underwent construction and vegetation plantings in 2012. After construction there are approximately 500 acres of agriculture, 400 acres of warm season grass, 100 acres of three side channels, and 600 acres of early successional vegetation to include giant ragweed, willow, and cottonwood. Elwood currently contains approximately

Table 1. Call Surveys for Frogs and Toads conducted during 3 seasons; Late March to Mid-April, late April to Late May, and June and July.

Call Surveys	Benedictine # Species by Year			Dalbey # Species by Year			Elwood # Species by Year		
Wetland Type	2010	2011	2012	2010	2011	2012	2010	2011	2012
Ephemeral Farmed	0	0	0	7	9	0	7	7	0
Ephemeral Unfarmed	9	7	0	5	0	0	0	0	0
Tributary	3	2	3	0	0	0	5	4	3
Roadside Ditch	7	0	0	0	0	0	4	0	0
Scour Hole	7	3	2	0	3	0	0	0	0
Pond	6	8	3	3	0	1	0	0	0

1,116 acres. This area is comprised of 581 acres of cottonwood forest, much of it killed in the 2011 flood and is now grassland and standing dead timber. There are approximately 250 acres of food plots, agricultural lease, and bare ground, mostly sand deposits from flooding in 2011 and 280 acres of warm season grass.

Sampling — Three seasons were selected to conduct frog and toad surveys: March through Mid-April, Late April through Late May, and June through July. The techniques used in these seasons for amphibian sampling were call surveys, visual/dip net surveys, and drift fence-pitfall traps. Turtle trapping was conducted on five consecutive days at the end of July.

Prior to sampling, properties were assessed for appropriate habitats and those wetland habitats were categorized. The categories found on Kansas sites were: ephemeral pools farmed and unfarmed, tributaries, roadside ditches, scour holes, and ponds. All sampling gears were disinfected in 10% bleach solution or sun dried for 48 hours between sampling occasions to prevent the spread of *Batrachochytrium dendrobatidis* (Chytrid fungus).

Call Surveys — Each sampling site on a given property was sampled on the same night and sampled twice within a two week period in each sampling season. Call surveys began 30 minutes after sunset, winds were less than 15 miles per hour, no significant rainfall was falling, and air temperatures were above freezing. A two minute acclimatization period was given at each site and then five minutes of calls were recorded. The presence or absence of species, precipitation, cloud cover, wind velocity, water temperature at 4 cm depth, air temperature, and water pH was all recorded.

Tadpole Surveys — Sampling for tadpoles occurred at each site twice per season and one to two weeks after peak calling was observed, thus allowing for egg and tadpole development. All accessible areas were visually monitored by a minimum of two individuals walking the bank line prior to dip net sampling. Start and stop time of the visual survey was recorded, as well as the number of individuals and species observed. Egg masses were also noted and species determined when possible.

For dip net sampling all sites were sampled at least once. All amphibians collected in the sweep were placed in a five gallon bucket and identified to species if possible. After identification amphibians were returned to the wetland. If species could not be determined then specimens were preserved and identified in a laboratory to the lowest taxonomic level possible. Identification of tadpoles resulted in groups of toads (Eastern American, Woudhouse's and Great Plains), Boreal Chorus Frog, American Bullfrog, Cope's and Gray Treefrogs, Blanchard's Cricket Frog, Leopard Frog (Plains and Southern Leopard Frogs), Plains Spadefoot, and Eastern Narrow-mouthed Toad. A new or sterilized, with 10% bleach, dip net and bucket were used at each site to prevent the spread of chytrid fungus. Egg masses, larvae, and adults/juvenile amphibians were recorded, as were the habitat parameters and number of dip net sweeps per habitat type.

Drift fences and Pit Falls — Drift fences were made of 50 feet of aluminum flashing with two five gallon buckets buried at each end. Two funnel traps were placed approximately 12.5 feet along the drift fence from each bucket cluster. Frogs and toads encountered the drift fence and then followed along it until they entered a funnel trap or fell into a bucket. Buckets and funnel traps were left open and checked every day or two. Woodhouse toads and chorus frog adults were toe clipped, their metamorphs were injected with Visible Implant Elastomer (VIE) under the skin. All other species, adult and metamorphs, were injected with a VI Alpha numbered tag. Fifty percent of the wetlands were surrounded by drift fences. In 2009, silt fence drift fences were installed in five wetlands at Benedictine. In 2010, these silt fences were replaced with aluminum flashing and an additional 4 wetlands were added, one at Elwood Bottoms. A total of 71 drift fences were installed. All drift fences were destroyed during flooding in 2011 and none of the drift fences in Kansas were reinstalled in time for 2012 surveys.

Turtle Trapping — Turtle trapping was only conducted at Benedictine in 2010. Dalbey was added in 2011 and 2012. Hoop nets, 3 hoops per net, two feet in diameter with one inch bar mesh with a finger throat presented

Table 2. Visual and Dip Net surveys in 3 seasons; Late March to Mid-April, late April to Late May, and June and July.

Call Surveys	Benedictine # Species by Year			Dalbey # Species by Year			Elwood # Species by Year		
Wetland Type	2010	2011	2012	2010	2011	2012	2010	2011	2012
Ephemeral Farmed	0	0	0	3	4	0	3	4	1
Ephemeral Unfarmed	7	5	0	0	0	0	0	0	0
Tributary	2	2	0	0	0	1	0	5	1
Roadside Ditch	3	0	0	0	0	0	0	0	0
Pond	4	5	2	0	0	0	0	0	1
Scour Hole	0	1	0	0	1	0	0	0	0

horizontally. The net was treated to prevent dry rot and a float was inserted and tied to the middle hoop to provide an air pocket for trapped turtles. One net was set per quarter acre up to four for sites up to one acre. If a site was larger than an acre, then one net was set for each additional acre up to five acres for a maximum of eight nets. The nets were placed with 2/3 of the net submerged and not in danger of complete submersion. Ends of the net were secured by three metal T-posts. Nets were baited with one can of cat food (chicken liver being the main protein source) punctured four times on the top of the can. Traps were checked and rebaited each day for five consecutive days in July. Upon capture turtles were removed from the net, placed in a storage container, and then examined. Gender, age (adult vs. juvenile), weight to nearest gram, carapace length and width (to nearest millimeter) were all recorded. Individuals were marked with passive integrated transponder (PIT) tags, scute drilling, scute marking, or tags. Soft-shelled turtles and juveniles were marked using PIT tags. Hard-shelled turtles were double marked with using a drill and jig head paint made for use on fishing lures. Scutes were labeled from A to X in the clockwise direction with marking codes established prior to sampling in order to prevent duplication. Each selected scute was marked with the drill and paint.

RESULTS

Three amphibian survey methods were conducted: call surveys, dip net tadpole surveys, and pit fall trapping. Call surveys sampled the presence of species over time. Dip net surveys indicated which species successfully bred and in which breeding habitats. Lastly, pit fall traps indicated which species matured past their larval stage and into a terrestrial form.

Sampling in 2010 and 2011 were hindered by flooding at almost all properties during at least one of the sampling seasons. Even with the reduced sampling, all the frog and toad species known from the region were heard calling and all but the Eastern Narrow-mouthed Toad were collected as tadpoles. Turtle trapping was also curtailed by flooding but still 3 of 7 species of turtles were trapped during the 5 day trapping periods in July. In contrast 2012 was limited by drought which led to many wetlands being dry. Only 12 wetlands were sampled, for amphibian calling, across all sites compared to 29 in 2010 and 45 in 2011.

Ephemeral wetlands, whether farmed or unfarmed, had the greatest species richness, 11 species, in 2010 and 2011. There were 11 species heard calling at Benedictine and ten at Dalbey and eight species were heard calling at Elwood in ephemeral habitats. This is compared to ten and four species heard in ponds on Benedictine and Dalbey, respectively, and seven species heard in tributaries at Elwood, these habitats being the second most rich (Table 1). The ten species heard calling in ephemeral wetlands at Benedictine were Eastern American Toad, Boreal Chorus Frog, American Bullfrog, Cope's and Gray Tree Frogs, Woodhouse's Toad, Blanchard's Cricket Frog, Plains Leopard Frog, Southern Leopard Frog, Great Plains Toad, and Eastern Narrow-mouthed Toad. Dalbey was similar. At Elwood the species were similar to Dalbey except Plains Spadefoot were heard calling and no American Bullfrogs were heard. No species was recorded in ephemeral wetlands in 2012 due to drought. Responses to call surveys, in 2012, were limited to permanent waters in tributary streams, scour holes, and ponds (Table 1).

Tadpole surveys were conducted using dip nets. These revealed that ephemeral wetlands also had the greatest species richness in tadpole captures, seven different groups of tadpole (Table 2) were captured as compared to six in ponds. These groups most likely represent all 11 species of amphibian heard calling. The groups captured were: Toads (Eastern American, Great Plains, and Woodhouse's), Boreal Chorus Frogs, American Bullfrogs, Cope's and Gray Treefrogs, Blanchard's Cricket Frog, Leopard Frogs (Southern and Plains Leopard Frogs), Plains Spadefoot, and Eastern Narrow-mouthed Toad.

In 2010, when analyzing pit fall trap captures, newly emerged plains leopard frogs and southern leopard frogs and Cope's and Gray's Treefrogs were lumped together in their respective genera. It was assumed that

Table 3. Drift Fence recruitment surveys conducted in 2010 and 2011 at Benedictine and Elwood Bottoms.

Drift Fence Surveys	Benedictine Bottoms		Elwood Bottoms
For Recruitment	2010	2011	2011
Leopard Frogs	86	1	481
Copes and Gray Treefrog	1	37	0
Cricket Frog	0	48	0
Boreal Chorus Frog	0	50	2
Great Plains Toad	0	366	0
Plains Spadefoot	0	0	5
Woodhouse's Toad	0	16	0
Eastern American Toad	1	0	0
Total Species	3	6	3

if one of the above lumped species was heard calling that it was also part of the neonates collected by trapping. Pit fall surveys verified that in 2010 Plains and Southern Leopard Frogs, Cope's and Gray Treefrogs, and Eastern American Toads all metamorphosed successfully at Benedictine. In 2011 with samples from both Benedictine and Elwood seven species metamorphed: Blanchard's Cricket Frog, Boreal Chorus Frog, Cope's and Gray Treefrog, Plains Leopard Frog, Great Plains Toad, Plains Spadefoot, and Woodhouse's Toad. Leopard frogs dominated pit fall captures in 2010 at Benedictine but Great Plains Toads were the species dominating captures in 2011. At Elwood, leopard frogs were again the dominant captures. Most likely Southern Leopard Frogs were also among the neonate leopard frog captures. These trapping results support the successful reproduction of all species heard calling except American Bullfrogs, American Toads, and Eastern Narrow-mouthed Toads (Table 3).

Turtle trapping over the three years 2010, 2011, and 2012 had highly variable water level conditions. These differing conditions changed the areas that could be trapped each year and led to the lumping of some categories. Scour holes and ponds were lumped together, as were ditches and unfarmed ephemeral wetlands, the Missouri River and side channels, and backwaters and overtopped or failed levee units. These flooded levee units were 630 and 800 acres in size. The levees overtopped for close to 90 days and had the river flow through parts of them. As the water receded the units became disconnected functionally providing backwater habitats.

Six species of aquatic turtles are known from the Kansas counties bordering the Missouri River. The turtle trapping captured five of these, only the Midland Smooth Softshell was not captured. Backwater and Tributary habitats both contained all five of the aquatic turtle species captured. Captures in ephemeral wetlands had three species, ponds contained two species, and the Missouri River had one species.

The turtle trapping in 2010 was limited to Benedictine and due to flooding was confined to one five day session in July (Table 5). Four habitats were sampled: pond, backwater, tributary, and unfarmed ephemeral wetlands. Turtles were caught in all habitats. Red-eared Sliders (Sliders) and Western Paint Turtles (Paint Turtles) were captured in all of the habitats. Snapping Turtles (Snapping Turtles) were captured in all but the ephemeral wetlands.

In 2011 and 12, turtle trapping was conducted at Benedictine and Dalbey (Table 4 and E). Flooding in 2011 impacted and changed the four habitats sampled to: backwaters, unfarmed ephemeral wetlands, Tributaries, and Missouri River. In 2012, ponds, Missouri River, and tributaries were again sampled but there were no ephemeral wetlands, due to the drought. The species captured were Sliders, Paint Turtles, Snapping Turtles, Western Spiny Softshell (Softshell), and the False Map Turtle.

Catch Per Unit Effort (CPU) varied by years as well. The CPU was 0.06, 0.04, and 0.11 at Benedictine in 2010, 11, and 12, respectively. Dalbey had a CPU of 0.08 and 0.33 in 2011 and 2012 respectively. Sliders were the most common species captured across most habitats and years with a total of 104 captures. This compares to 28 Paint and 22 Snapping Turtles, the next two most abundant species. Backwaters had the largest total number of turtle captures 70, followed by tributaries at 69 captures.

DISCUSSION

The varying weather and flood conditions on the study areas were extreme for a three year period. There was flooding in 2010 from local rain events and rising river levels from upstream rain, 2011 saw flooding brought about by upstream rains and rising water levels but limited local rainfall, and 2012 had drought conditions locally and in the upper river basin. The disconnected floodplain and the differing levels of levee protection among the sites also created differing site conditions. Benedictine and Elwood are both protected by levees with a 1% chance of overtopping annually and did not overtop or fail, while Dalbey was protected by levee with a 10% chance and it both overtopped and failed. Even though a levee does not fail, it does not mean it is dry behind it. Additional waters can build up behind a levee and provide habitat for amphibians and turtles. This additional water can be seepage water, seeping up from the ground, or as water that cannot be vacated from behind the levee because of high river levels. These are all conditions that existed during the study, exhibiting the altered but still dynamic nature of big river floodplains both levee protected and unprotected.

The drought in 2012 limited the species richness of frogs and toads calling to only three species: Plains

Table 4. Turtle traps set at Benedictine Bottoms in July 2010, n=161 trapnights, July 2011, n=113 trapnights, July 2012, n= 15. There were 43 total captures with 6 being recaptures in 2010, 25 captures in 2011, and 8 captures and 2 recaptures in 2012.

Benedictine Bottoms Turtle Surveys	Backwater/ Scour Hole			Ephemeral Unfarmed			Tributary			Pond		
Wetland Type	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Slider	12	7	4	6	4	0	3	4	0	0	0	0
W. Paint Turtle	4	2	1	8	0	0	3	4	0	1	0	0
Common Snapping Turtle	3	0	1	0	0	0	1	2	0	2	0	2
False Map Turtle	0	1	-	0	0	0	0	0	0	0	0	0
W. Spiny Softshell	0	0	0	0	0	0	0	1	0	0	0	0

Leopard Frog, American Bullfrog, and Blanchard's Cricket Frog, across all habitats. This is compared to the 11 species heard calling in 2010 and 2011. Only three species of tadpoles were captured in 2012, these were the American Bullfrog, Plains Leopard Frog, and Boreal Chorus Frog tadpoles. Blanchard's Cricket Frogs were heard calling but no tadpoles were found and Boreal Chorus Frog tadpoles were found but not heard calling. It would seem that the lack of ephemeral wetlands seriously curtailed calling and breeding in 2012. However, this would probably be oversimplifying the situation. Weather conditions, lack of rainfall, that resulted in no ephemeral wetlands are also not conducive to amphibian breeding. The fact that species from previous years were not heard from permanent water sources would indicate that the latter could be the true cause of decreased amphibian breeding indicators.

The absence of pit fall trapping in 2012, due to the 2011 flood destroying all the drift fences, decreased the ability to verify successful reproduction and maturation of most previously sampled species. The data collected does support the highly variable conditions and levels of productivity by species and between years and habitats (See Table 3). The species surveyed were known to have the ability to take advantage of optimal conditions and to maximize their reproductive success when conditions exist. This trait is suited to the dynamic nature of floodplains and the climatic conditions existing in the study areas.

Tadpole surveys confirmed reproduction was occurring on mitigation sites by the species heard calling, except in the case of the Eastern Narrow-mouthed Toad, which had no tadpoles captured. Tadpole identification to species is difficult, so Treefrog, Leopard Frog, and True Frog species were all lumped to genera. So the above conclusion has the assumption that both species of Treefrog and Leopard Frog, as well as the three species of True Toads are present as tadpoles.

Table 5. Turtle traps set at Dalbey Bottoms in July 2011, n=140 trapnights and July 2012, n= 60. There were 55 total captures with 4 being recaptures in 2011, 40 captures and 2 recaptures in 2012.

Dalbey Bottoms Turtle Surveys	Backwater/ Fields		Tributary		Missouri River	
Wetland Type	2011	2012	2011	2012	2011	2012
Slider	13	12	15	21	0	1
W. Paint Turtle	2	0	2	1	0	0
Snapping Turtle	5	0	4	0	0	0
False Map Turtle	4	0	2	3	0	0
W. Spiny Softshell	8	0	0	3	0	0

The habitat for turtles also differed between years. The increase of aquatic habitat in 2011 coincided with the lowest catch per unit rates of all three years sampled and the driest year coincided with the highest CPU effort. Most likely this was due to the larger area that aquatic turtles could utilize in 2011 and the increased amount of food flushed into the floodplain habitats by the overtopping Missouri River. Conversely, the drought conditions of 2012 concentrated the turtles and limited their food resources, making baited traps more attractive.

The CPU for Dalbey was twice as great in 2011 and 3 times as great in 2012 compared to CPU at Benedictine, but both displayed a large increase of CPU from 2011 to 2012. The difference of CPU between sites is most likely due to flooding and connection of the Missouri River to the Dalbey site during 2011. This flooding could have allowed for an influx of turtles from the river whereas Benedictine remained levee protected and would not have had as many immigrant turtles. These numbers would have prevailed into 2012 and become more pronounced as the turtles were forced to concentrate into smaller water bodies.

Backwaters and tributaries seem to be the preferred habitats for Snapping turtles, False Map Turtles and Softshells. Backwaters also were the most species rich and had the highest capture totals of the habitats sampled followed closely by tributaries. These two areas accounted for 26% of all turtle captures across all three years and these were the only habitats that could be sampled at Dalbey in 2011.

Turtles occupy all types of aquatic habitat and the creation of any aquatic habitat would illicit a positive response. Some of the less common aquatic turtles, Softshells and False Map Turtles would benefit from

additional backwater acreages. They responded positively to the backwaters created by the 2011 flooding.

These survey results continue to validate the importance of ephemeral wetlands as they had the greatest species richness of amphibians of the four habitats sampled. Tributaries and pond or scour holes are also important, having just slightly less amphibian species richness and being important in dry years as breeding sites and refugia. Tributaries are also important to aquatic turtle richness at all times.

ACKNOWLEDGMENTS

This project was part of a larger survey effort in Nebraska, Iowa, Kansas, and Missouri for amphibians and turtle in the Missouri River floodplain, funded by the US Army Corps of Engineers. The information was taken from three annual reports provided to the US Army Corps of Engineers. The real work on the project came from Daniel Drimmel, Alex Prentice, Michael Godin, Daniel Martin Simon all with the Department of Biology, Benedictine College at the initiation of the study. They did field work as well as compiled the data for the annual reports. The Kansas Department of Wildlife, Parks, and Tourism also assisted with the project, as did countless other volunteers. Rick Morrow aided by reviewing the article.

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2015 Fort Riley Herpetofaunal Count Final Report

The 14th Annual Fort Riley herpetofaunal count was held on 17 April. These counts were initiated in 2002 (Table 1) and have resulted in the survey of 12,653 individual amphibians and reptiles. The 2015 count included 44 participants that spent 5.5 hours each (242 total survey hours) searching for amphibians and reptiles at predetermined locations throughout the site (Table 2; page 11).

Table 1. Overview Annual Herpetofaunal Counts 2002-2015

Year	Species	Individuals	Participants
2002	25	479	24
2003	27	251	15
2004	27	741	25
2005	24	714	18
2006	20	723	20
2007	28	757	22
2008	27	1038	28
2009	29	1259	35
2010	25	927	42
2011	24	1194	43
2012	31	661	55
2013	24	1508	43
2014	31	1010	52
2015	25	1391	44

Areas surveyed in 2015:

- Training Areas 3, 17, 18, 20, 23, 24
- Maneuver Areas A, D, G, H, J, K, N

Areas not surveyed or missed included:

- Maneuver areas B, C, E, F, I, L, M, O, P, Q
- Training Areas 1, 2, 4-16, 19, 21, 22

The current procedure is to survey half the installation during the annual herpetological counts to help concentrate efforts for a more thorough search of areas and habitat types.

And interactive map featuring these areas can be found at:http://asis.maps.arcgis.com/apps/webappviewer/index.html?id=462b3050e9f6489299015bcf51b00788

Conditions were mostly cloudy and 74° F, with a light easterly wind at 13 mph

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Table 2. Species Numbers Area(s) found (Training Area #'s). Total species: 25. Total individuals: 1,3391.

Species	Count	Locality
Pond Slider	2	CAN, 81
Eastern Collared Lizard	15	17, 23, 47, 79, 80, 82, 85
Great Plains Skink	35	3, 20, 47, 51, 54, 64, 66, 81, 82
Six-lined Racerunner	15	51
Little Brown Skink	4	3, 23, 66
Slender Glass Lizard	1	79
Ring-necked Snake	920	3, 17, 18, 20, 23, 47, 48, 49, 51, 54, 58,64, 65, 66, 71, 79, 80, 81, 82
North American Racer	13	47, 49, 51, 54, 66, 71, 85
Great Plains Ratsnake 1	7	17, 20, 47, 49, 85
Western Ratsnake	2	3, 70
Western Milksnake	22	3, 49, 51, 66, 71, 79, 80, 81
Gophersnake	2	79, 85
Common Gartersnake	7	64, 66, 71, 85
Lined Snake	4	49, 54, 66
Dekay's Brownsnake	3	66
Common Watersnake	1	66
Speckled Kingsnake	1	3
Eastern Copperhead	6	3, 17, 20
Plains Gartersnake	6	64, 66, 67
Yellow-bellied Kingsnake	3	66
Blanchard's Cricket Frog	172	18, 23, 58, 59, 64, 71, 79, 81
American Bullfrog 1	19	23, 49, 53, 58, 59, 66, 71, 79
Western Narrow-mouthed Toad	5	17, 85
Plains Leopard Frog	15 1	8, 24, 64, 79
Woodhouse's Toad	1	18

Cantonment Area west of 1st Division Rd.= CAN *

ARTICLES

Confirmation of Species Identity, Body Sizes, and Clutch Characteristics of the Eastern Gray Treefrog (*Hyla versicolor* LeConte, 1825) from Cumberland County, Pennsylvania

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Abstract — We examined a population of the Eastern Gray Treefrog, *Hyla versicolor*, from south-central Pennsylvania to confirm species identity and provide site-specific natural history data for this geographically widespread but poorly-studied species in Pennsylvania. Mean body size of adult males (45.8 mm) was smaller than that of females (50.8 mm). Individuals were active during May–September. Most breeding activity was evident during May-early June and followed by a smaller peak in early August. Juveniles were evident throughout August and into early September, with body size-distributions suggestive of July transformation as well. Clutch size averaged 1733.7 eggs and ovum diameter averaged 1.3 mm. No significant relationships were detected between these two variables or between either of them and female body size. Adult body sizes and general activity and breeding seasons of our Mid-Atlantic sample were similar to those studied elsewhere in the Northeast.

INTRODUCTION

The Eastern Gray Treefrog, *Hyla versicolor* LeConte, 1825, and Cope's Gray Treefrog, *H. chrysoscelis* Cope, 1880, represent an eastern North American complex of two sibling species that differ in chromosomal number (Wasserman, 1970; Conant and Collins, 1998; Vrijenhoek, 2006): Tetraploid in the Eastern Gray Treefrog, diploid in Cope's Gray Treefrog. In the United States, the Eastern Gray Treefrog is found primarily in the northeastern quarter of the country, eastern portions of Oklahoma and Texas, northwestern Arkansas, and in southeastern Louisiana (Cline, 2005a). In the United States, Cope's Gray Treefrog occurs throughout much of the eastern half of the country, exclusive of portions of the Northeast (Cline, 2005b). Both species are members of the Pennsylvania herpetofauna (Hulse et al., 2001; Meshaka and Collins, 2010), with Cope's Gray Treefrog having been reported only from the extreme southwestern part of the state (Cline, 2005b). Two goals are associated with our study. First, we wanted to verify the species identity at a site in south-central Pennsylvania whose amphibians are the subject of ecological study by WEM, EW, and PRD. Secondly, we wanted to provide data on adult body size, larval transformation times, and clutch characteristics all of which, perhaps because of general ambiguity of the species identification, are uncommon in the general literature and unknown for Pennsylvania.

MATERIALS AND METHODS

Surveys were made after dark in 2012 (23 May and 1 June) and 2014 (14 & 30 April, 7, 15, 21, 27, 30 May, 3, 12 & 21, 1 & 25 June, 14 & 23 July, 3 & 12 August, 2 & 9 September, and 15 & 29 October) on 850 m of roads and in ponds alongside the roads bisecting agricultural fields in Walnut Bottom, Cumberland County, Pennsylvania. These were disturbed habitats of a mix of Pennsylvania crop lands (corn, alfalfa, soy bean, etc), with inter-dispersed patches of temperate deciduous forest and shallow temporary and open wetlands. We chose survey dates based on warm and humid or wet conditions thought to be favorable for anuran activity. We noted calling, and frogs were euthanized immediately upon capture, fixed in formalin, and later transferred to 70% methylated alcohol. We measured snout-vent length (SVL) to 0.1 mm using a set of hand

calipers. We removed clutches and counted all mature ova to estimate clutch size. Ten ova were randomly chosen from each clutch for measurement of diameter with the use of an ocular micrometer with an accuracy of ± 0.1 mm. Diameter of the oviduct at mid-point was measured also with the use of an ocular micrometer. Means were followed by ± 1 standard deviation. We performed all statistics on Excel, and statistical significance was recognized at p value of 0.05. All specimens are housed in the Section of Zoology and Botany of the State Museum of Pennsylvania, Harrisburg.

Noble and Hassler (1936) first described two call types from a Baltimore railroad yard for what was then considered only a single species: One was a harsh, fast-trilling form, while the other was a more mellow, slow-trilling, form. Call frequency differs between the species, with a slower trill typifiying the Eastern Gray Treefrog (Jaslow and Vogt 1977; Cline 2005a,b). No calls in 2012 or 2014 seemed to us to be that of Cope's Gray Treefrog; however, karyotype analysis using a modified version of the technique by Wiley and Little (2000) was conducted to verify species identity. Frogs were anesthetized by submersion in MS-222 dissolved in tap water (1:1000). Once Stage 3, plane 2, of surgical anesthesia was attained (loss of righting reflex, palpable reflex, and response to toe pinch), animals were removed from solution, double pithed, placed in supine position, and draped with saline (0.9N NaCl) soaked sponges. The beating heart was located by palpation and a mid-sagittal thoracic incision was made directly over the site (≤ 1cm in length). Once through the ventral thoracic wall, the pericardium was isolated and bisected, and the heart was partially elevated out of the mediastinum using curved hemostatic forceps. Using the hemostats for lateral and cranial stabilization, the apex of the heart was punctured for blood sampling using a 23-gauge needle attached to a 1 mL heparin-washed (1,000 units/ mL) syringe. Approximately 0.4 mL of whole blood was withdrawn and placed into 1mL Eppendorf tubes for further processing.

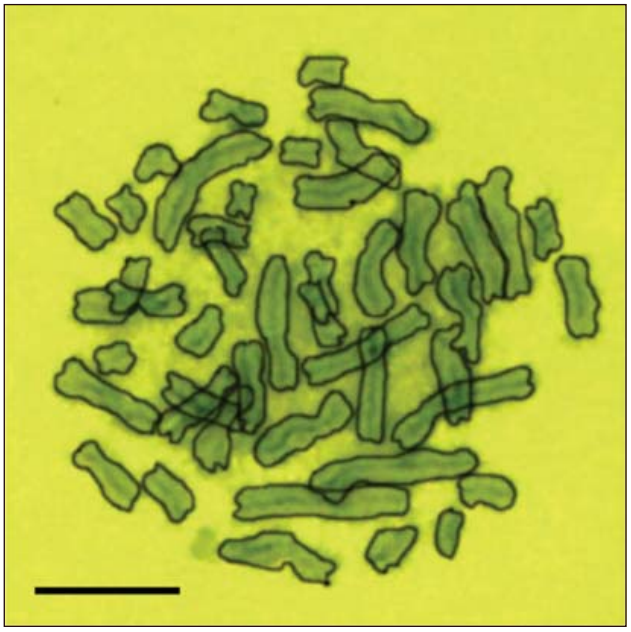

Figure 1. Photomicrograph with a 10 micron bar showing the 48 chromosomes of the Eastern Gray Treefrog, *Hyla versicolor*. Individual chromosomes are outlined in black.

Blood was centrifuged at 800 x g for 10 minutes. The plasma and buffy coat layers were transferred to 2 ml of 50% L-15 medium containing 10% fetal bovine serum, 1% glutamine, 1% penicillin/streptomycin, 10 μg/ml phorbal 12-myristate 13-acetate-4-o-methyl ether and 10 μg/ml phytohemagglutinin for 72 hours at room temperature. After 72 hours, 0.1 μg/ml colcemid was added for an additional two hours. Cells were then centrifuged at 800 x g for five minutes and incubated in 0.05 M potassium chloride for 15 minutes at room temperature. Cells were once again centrifuged at 800 x g for five minutes and fixed in 3:1 methanol:acetic acid for 10 minutes at room temperature. The fixation step was repeated two more times reducing the time to five minutes. Following the final fixation, cells were re-suspended in 0.5 ml 6:1 methanol:acetic acid and dropped from a distance of about 3 cm onto cold, wet glass microscope slides. The slides were dried, stained with Giemsa for five minutes, rinsed with distilled water, and examined for chromosome spreads.

RESULTS

Species identification- The karyotype procedure was successful in one of the four individuals examined for which it revealed 48 chromosomes (Figure 1), diagnostic of the Eastern Gray Treefrog. We note that most tetraploids are revealed when they form groups of four

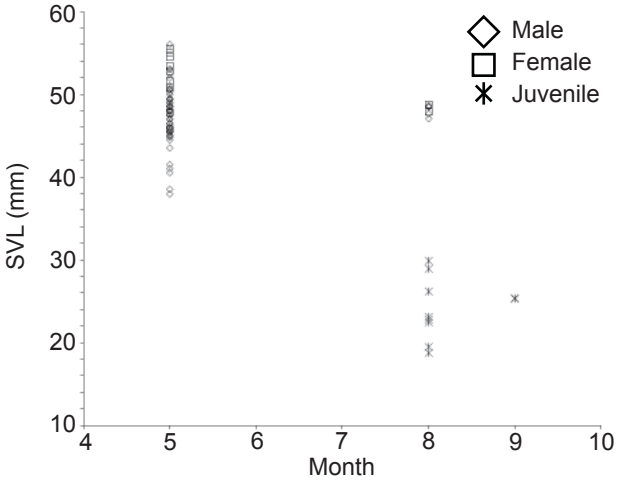

Figure 2. Monthly distribution of body size of the 89 Eastern Gray Treefrog (*Hyla versicolor*) captured from Walnut Bottom, Cumberland County, Pennsylvania, during the study period of April to October 2014.

chromosomes (tetrads) during metaphase. Some populations of the Eastern Gray Treefrog are old enough that they are undergoing diploidization, whereby they pair up as two sets of chromosomes during metaphase. Because our sample was not captured in metaphase, we cannot comment on the age of this group.

Body sizes- Among adults, 20 males (mean = 40.0 ± 1.8 mm SVL; range = 35.9–44.2) and two females (43.3, 52.7 mm SVL) were collected in 2012. The 2014 sample of males (mean = 47.5 ± 3.1 mm SVL; range = 38.0–56.0; n = 68) and females (mean = 51.3 ± 3.3; range = 45.8–55.5; n = 11) differed significantly from one another with respect to mean (t = 3.647; df = 77; p = 0.0005). The male:female mean body size ratio of the 2012 sample was 0.93:1.00. A between-year comparison of adult male body sizes revealed significant differences in variance (F = 2.868; df = 67; p = 0.006) and mean (t = 13.448; df = 54; p < 0.0000). In a combined 2012 and 2014 sample, mean adult body size of males (mean = 45.8 ± 4.3 mm SVL: range = 35.9–56.0; n = 88) differed significantly (t -3.937; df = 99; p = 0.0002) from that of females (mean = 50.8 ± 3.8 mm SVL; range = 43.3–55.5; n = 13). The male:female mean body size ratio of the combined 2012 and 2014 sample was 0.90:1.00.

Terrestrial movements and calling- During the April-October study period, adults were found moving or at ponds on 15, 21, and 27 May and 3 August (Figure 2). Calling from either trees, as early as 15 May, or ponds was heard during May–August. Pairs were seen in amplexus on 21 May. Juveniles were found crossing roads at night on 3, 12, and 21 August and on 2 September 2014. Both the smallest (18.8 mm) and the largest (29.9 mm) juvenile were captured in August (12 and 21 August, respectively), and a sample of eight individuals from August averaged 24.0 mm (± 4.1; range = 18.1–29.9). Within this group were four apparent cohorts, each approximately 3 mm difference in size from the next cohort (Figure 2). Two juveniles measuring 25.3 and 25.4 mm were found on the road on 2 September.

Clutch characteristics- Clutch size estimates of the 2014 sample ranged 422-2327 eggs (mean = 1663.0 ± 491.3; n = 11), ovum diameter ranged 1.1–1.6 mm (mean = 1.3 ± 0.1 mm; n = 110), and oviduct diameter of gravid females ranged 1.8–2.7 mm (mean = 2.4 ± 0.3; n = 11). Two of the 11 females examined in 2014 were captured on 3 August. Although similar in body size, their respective clutches greatly differed between them: 47.9 mm SVL with 422 eggs and 48.8 mm SVL with 1560 eggs. With the addition of two gravid females from 2012, clutch sizes averaged 1733.7 eggs (± 507.4; range = 422–2521; n = 13), ovum diameter averaged 1.3 mm (± 0.1; range = 1.0–1.6; n = 13), and diameter of the oviduct averaged 2.2 ± 0.4 mm; range= 1.6–2.8; n = 13). No statistical significance (p > 0.05) using a linear regression was detected in relationships between female body size and clutch size, mean ovum diameter, or maximum ovum diameter, nor was statistical significance detected in relationships among ovum diameters and clutch size.

DISCUSSION

The Eastern Gray Treefrog (*Hyla versicolor*) was confirmed to be the subject of our study based on the numbers of chromosomes. Although we acknowledge the small sample size, it seemed unlikely, based on call, that this was the exception. Adult body sizes at our site varied between years among two samples of males. Minimum and mean adult body sizes of our samples were similar to those of males (36 and 46.3 mm, respectively) and females (43 and 49.9 mm, respectively) examined from populations in the Northeast (Klemens, 1993). The 0.93:1.00 male:female mean body size ratio of Klemen's (1993) sample was similar to those of our sample (0.90 and 0.93:1.00).

The smallest transformed individuals in our sample measured 18.8 and 19.5 mm SVL and are presumed to have transformed in August when they were captured. The largest juveniles (28.9, 29.9 mm), also captured in August, are presumed to have transformed in August of the previous year. For this latter cohort, it seems probable to us that some males could reach the minimum size of sexual maturity of 35.9 mm SVL in time to reproduce for the first time the following May at an age of approximately one year and nine months. For all other males and all females of that cohort, a minimum age at sexual maturity of two years and nine months seemed most likely.

For Eastern Gray Treefrogs generally, larval transformation was reported to occur during 27 June-August (Wright and Wright, 1949). In Connecticut, metamorphosing frogs were found during July-August, and in and near one pond on 2 August, tadpoles ranged from young tadpoles absent a red tail to newly-transformed froglets (Klemens, 1993). In Iowa, tadpoles transformed during late June–July (LeClere, 2013). In Arkansas, 19–20 mm (mean = 19.5 mm) individuals were found on 14 June and those averaging 17 mm found on 9 August (Trauth et al., 1990).

Multiple visits each month during April-October indicated that terrestrial movements (May-September) and breeding (calling or gravid females) (May–August) were most apparent during mid-May–early June and again in early August. Likewise, in the Northeast, most breeding was noted in May and June but as late as August (Klemens, 1993). Two distinct cohorts of juveniles were recorded during the breeding season in the Northeast (Klemens, 1993), leading Klemens (1993) to wonder if females oviposited twice during the same

season. The body size distribution of young-of-the-year (Figure 2) was indicative of more than one cohort, and the disparity of clutch size of two similar sized females (47.9 and 48.8 mm SVL) collected 3 August opens the possibility of either a late or second clutch by the 47.9 mm SVL female. Clutch size of the Eastern Gray Treefrog was reported to be approximately 1800 eggs (Wright, 1932), similar to our value and somewhat smaller than the 1288–2604 eggs (mean = 2070 eggs) reported in Arkansas (Trauth et al., 1990).

Our research provided a confirmation of the presence of the Eastern Gray Treefrog karyotype in a specific site in south-central Pennsylvania. Our surveys indicated that despite the artificially disturbed nature of the habitats, with a strong agricultural presence, this location supported a widespread presence of this species. The selected morphometric and life history characteristics of this population were consistent with those of other populations in the Northeast. Despite a statewide distribution, distinct call, and ease of capture during breeding, natural history data of the Gray Treefrog remain conspicuously missing for Pennsylvania populations. Therefore, we strongly recommend that more efforts to confirm the identity of both, the Eastern Gray Treefrog and the Cope's Gray Treefrog are undertaken across the state. Lastly, additional natural history data are deeply needed to better understand the ecological relationships between the two sibling species and to formulate effective conservation approaches for this segment of the Pennsylvania biota.

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Fourth and Final Update!

UNIVERSITY OF KANSAS SSAR MEETING

THURSDAY, JULY 30 – MONDAY, AUGUST 3, 2015

Society for the Study of Amphibians and Reptiles

co-sponsored by Partners in Amphibian and Reptile Conservation (PARC)

together with the herpetological societies of Kansas, Missouri, and Arkansas, the Center for North American Herpetology, *and the* International Society for the History and Bibliography of Herpetology

• For registration and full conference details, visit SSAR2015.ku.edu •

Transportation, Parking and Housing

The Kansas City International Airport is one hour northeast of Lawrence. Shuttle options include vans. See list at www.flykci.com/directions/shuttle/Index.htm.

Ample free parking within a 3-block radius of conference activities will be available in surrounding university lots and nearby streets.

A wide variety of housing options are available ranging from low-cost dormitory rooms that can be shared to local hotels and motels. Options include:

- Springhill Suites by Marriott (downtown)
- The Oread Hotel (1 block away): $149–169
- Holidome (2 miles away): $80 for up to four people including breakfast
- On-campus dormitory housing: $40–$60

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Registration Fees (Deadline June 30th)

Student members*	US $160
Regular members	$295
Seniors (retired / over 70) (membership not required)	$160
Non-members	$375
Late surcharge for all after June 30	$80

*For this meeting, student members of SSAR, HL, ASIH, and other international, national, and regional herpetological societies are eligible for the SSAR student member rate, but they must provide written evidence of their membership (statement from society officer, student's advisor, or other authority).

•

Deadlines for Presenters (May 15th)

Abstracts for all papers (oral and poster) are due to the conference organizer by May 15th. These should include title, author or authors, and address (both postal and email). Full details on format for abstracts and posters as well as available projection facilities may be found on the SSAR 2015 meeting website SSAR2015.ku.edu.

•

Meeting website (available March 15)

Visit SSAR2015.ku.edu for the day-by-day meeting schedule, registration, airport shuttle, parking, accommodations, meals, special events, tours, juried prizes, auction donations, committee meetings, socials and other activities associated with this meeting.

SSAR will hold its 2015 meeting on the beautiful and centrally located campus of the University of Kansas in Lawrence. All scientific sessions will be held in the Kansas Union, which is adjacent to the KU Biodiversity Institute and Natural History Museum, the setting of more than a century of research and graduate education in herpetology. The intimate campus setting will facilitate personal and friendly interactions while moderating fees for registration and lodging.

This unique campus format meeting will include oral and poster presentations, silent and live auctions, vendor displays, student social, symposia, and special lectures provided by David Hillis (Keynote), Harry W. Greene (Plenary), and Miguel Vences (President's Travelogue).

Conference activity highlights include:

- Redesigned audiovisual shows arranged by David Dennis and Eric Juterbock
- Reception honoring distinguished senior herpetologists, allowing students to interact personally with luminaries in the field
- The Herpetological Quiz, arranged by the graduate students at UT Arlington and KU, with prizes for winners
- Guided tours of herpetological collections and newly renovated laboratories in the Biodiversity Institute
- Tour of the Fitch Reservation (*see photo on next page*) at the KU Biological Field-station and Reserves, led by George Pisani
- Special presentation for the International Society for the History and Bibliography of Herpetology featuring author Sally Haines of the KU Spencer Research Library
- Display of live Kansas herps with photographic set-ups

SYMPOSIA UPDATES

Finalized Participants

Bones, Frogs, and Evolution

Organized by David Blackburn, Anne Maglia, and David Cannatella

This event will celebrate the exceptionally productive 40 years of scholarship of Linda Trueb and will include presentations by Ana Maria Bacer, David Blackburn, David Cannatella, Luis Coloma, Eli Greenbaum, Juan Guayasamin, Anne Maglia, Dave McLeod, Greg Pregill, Chris Shell, Hillo de Silva, Erik Wild, and Marvalee Wake. Introduction by Leonard Krishtalka and summary by William Duellman.

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Frontiers in Integrative Organismal Biology: Herpetological Horizons

Organized by Rich Glor and Rafe Brown

This event will bring together a group of exceptionally research-active herpetologists working at the forefront of evolution-related fields, using amphibians and reptiles as study systems. Topics include speciation, adaptive radiation, convergence, phenotypic evolution, and the evolution of development—all through the lens of genomic approaches to understanding evolution of amphibians and reptiles. Participants include Frank Burbrink, Todd Castoe, Ben Evans, Matt Fujita, Lake Harmon, Ryan Kerney, Adam Leaché, Emily Lemmon, Jim McGuire, Rachael Mueller, Dan Rabosky, Erica Rosenblum, Robert Thompson, John Wiens, and Kelly Zamudio. Summary by David Wake.

continued on next page

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.

Editorial Policy

Collinsorum, currently issued quarterly (March, June, September, and December), publishes all society business.

Submission of Manuscripts

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.

Reprints & Artwork

Collinsorum publishes original peer-reviewed submissions under the Articles and Notes sections. Upon review, acceptance, and publication, Portable Document File (PDF) copies are provided gratis to the author on request. Figures and photographs submitted with manuscripts are welcome, but must be sized appropriately by authors for this journal's column sizes (i.e., 19.5 or 39 picas wide). Particular attention should be paid to reduction of text on the figures.

Societal Awards, Grants, and Recognitions

Distinguished Life Members

Individuals selected as *Distinguished Life Members* are chosen by the KHS Executive Council based on their distinguished published research papers on Kansas herpetology.

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.

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.

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 a Kansas amphibian, reptile, or turtle. *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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