Association of clutch size and sex determination in turtles

Poster (Friday, April 20, 2018)

Sarah Hill
Iowa State University

Association of clutch size and sex determination in turtles

This research projects aims to identify any relationships between the clutch size and sex-determining mechanisms (genotypic and temperature-dependent) in turtles. This study incorporates all species of turtles for which both clutch size and sex determination information is available based on prior research. Once the information is gathered, it will be evaluated in order to find some form of correlation between these two traits. Existing research examining the relationship between turtle sex determination and chromosome number has shown that these two traits coevolved, and that climate change is potentially related to turtle evolutionary movements. Finding a link between turtle clutch size and sex determination will potentially shed light on how the number of eggs a species typically lays per nest is related to how they may evolve in the future. Few past studies have examined this relationship specifically but finding a connection between these two traits in turtles may provide better understanding to how turtles evolved in the past and how they may continue to do so in the future.

Response of bee species to habitat transition from prairie to temperate deciduous forest

Poster (Friday, April 20, 2018)

Alec Rutherford Adam Hoffman Stephen Hendrix Gerald Zuercher
University of Dubuque

Bees play valuable roles in both natural and agricultural lands as they positively impact ecosystem biodiversity and provide economic benefits. Little is known about native Iowa bee communities and if adjacent habitats, such as forests and prairies, have fundamentally similar or different communities. Using fluorescent pan traps, 120 meters transects were established in three separate prairies, and the surrounding temperate deciduous forests. Over 20 genera were represented in the 809 specimens that were collected in the summer of 2017. The most common genus captured overall was Lasioglossum (Halictidae), with 37% of all bees captured, representing nearly 300 individual specimens. Statistically significant differences ($p < 0.05$; $t = 1.94$) in the number of bees captured in the prairie versus bees captured from the forest environment were noted, as bees captured in prairie habitats outnumbered bees captured in forest habitats during our sampling by a 4:1 margin. Lasioglossum was associated most commonly with prairie habitat as only 5% of the individuals were captured in the forest. The most common genus captured in the forest was Ceratina (Apidae), 57 of the 128 total individuals were captured within the forest. Some Genera commonly occurred in both habitats as both Ceratina and Nomada (Apidae) were found in similar proportions at each habitat.

Comparison of Aquatic Call Playback Surveys for Owls

Poster (Friday, April 20, 2018)

Nicholas Engelhardt Paul Skrade
Upper Iowa University

Population surveys for nocturnal species are primarily conducted using call playback, i.e. broadcasting a recording of the species' and listening for their response. Eastern Screech-Owls (EASO, Megascops asio), Barred Owls (BADO, Strix varia), and Great Horned Owls (GHOW, Bubo virginianus) in Iowa are associated with forested areas and in northeast Iowa this is usually near water. Sound carries more easily over water than through forest so we compared the effectiveness of call playback surveys conducted from watercraft to surveys conducted from land. These were performed from flowing (Turkey River) and still (Volga Lake) water over a period of several nights to compare activity during a full and new moon. BADO were the most responsive with 48 individuals detected. This averaged out to 1.8 owls per point at Volga Lake and 1.6 on the Turkey River, which was similar to the number of BADO detected from land. Activity was also similar during the moon phases. Only one GHOW was detected from land near the river with the new moon. EASO were more active during the full moon with seven detected from land and one from the river.

Survivorship and habitat use variance between two cohorts of translocated Western Ringtail Possums (Pseudocheirus occidentalis).

Oral (Saturday, April 21, 2018)

Gerald Quinlan
Buena Vista University

The Department of Parks and Wildlife of Western Australia was asked to identify factors that could result in more successful translocations of medium-sized mammals. The task was given out to ensure the growth and maintenance of insurance populations for endangered animals within the state. This research looked at the maintenance of two different possum cohorts that were introduced to a predator free sanctuary within the Upper Warren region of south-western Australia. By looking at the two different cohorts of western ringtail possums translocated into the Perup Sanctuary, survivorship and habitat use were examined with respect to sex and where the cohorts were sourced from. It was found that there is a significant difference in the habitat use of the different cohorts; the population from the similar habitat type survived notably longer compared to the population of a different habitat type. There are also differences in same sex occupancy amongst the different cohorts between the six habitat types found in Perup. Further factors such as timing of release and stress of breeding could also cause variance between the two translocated populations.

Herpetofauna Surveys on Three Public Properties in Chickasaw County, Iowa

Oral (Saturday, April 21, 2018)

Katy Cantin Paul Skrade
Upper Iowa University

Amphibians and reptiles are in a steep decline globally, including species in the midwestern United States. In Iowa, habitat loss is the main cause for this decline, primarily deforestation and wetland drainage for agriculture. Chickasaw County exemplifies this, with over 90% of acreage in crop production. Remaining suitable habitat is often in private ownership; however small parcels are managed by the state and county for wildlife. We surveyed three of these public properties for herpetofauna in the fall of 2017 using coverboards and visual encounter surveys (VES) and additional surveys will be conducted in spring of 2018 including call surveys to increase detections of amphibians. Our initial surveys in 2017 yielded a total of 10 different species, with the majority found at the Upper Wapsi Wildlife Management Area. One species of garter snake (Thamnphosis sp.) was found DOR (dead on road) about a ½ mile from the Nelson Wildlife Management Area. No species were found at Wapsi Junction. Across all three management areas, no species of reptiles or amphibians were found under any coverboards and were located through VES, the most surprising being Storeria occipitomaculata and a large number of Notophthalmus viridescens louisianensis, (threatened in Iowa).

The landscape ecology and floristic composition of Spring Hill prairie in Marshall County

Oral (Saturday, April 21, 2018)

Thomas Rosburg
Drake University

Spring Hill Prairie is located northeastern Marshall County and contains about 78 acres of mostly grassland habitat. Five plant associations were delineated and mapped – upland prairie is the largest association with 51.5 acres (66%), alluvial grassland is the second largest with 17.8 acres (22.8%), a lowland grass/forb community occupies 8.1 acres (10.3%), the lowland grove, dominated by box elder and white mulberry, is 0.50 acres (0.6%), and a wet seep occupies 0.2 acres (0.3%).

There were 211 vascular plant species identified on Spring Hill, of which 178 were native and 33 were non-native, resulting in a non-native percentage of 15.4%, a relatively low measure of non-native presence among Iowa's natural and semi-natural areas. Saw-tooth sunflower, Virginia mountain mint, and hairy fruited sedge were the most widespread native species, and white mulberry and reed canary grass were the most widespread non-native species.

No species were observed that are on the list of priority plant species in Iowa (endangered, threatened, or special concern). However, there were 33 high conservative species found. The ecology and flora of this prairie pasture will be discussed in detail.

Urban Surveys for Common Nighthawks in Southeast Iowa

Oral (Saturday, April 21, 2018)

Erik Murry Paul Skrade
Upper Iowa University

The Common Nighthawk (Chordeiles minor) is an aerial insectivore in the night-jar family that has been in a population decline for over a decade. This species has adapted to living around humans and frequently nests on gravel roofs in urban areas. We conducted nocturnal surveys for this species in cities of varying sizes in southeast Iowa during the summer of 2017. The urban populations ranged in size from Gladwin (unincorporated) to Iowa City (~74,000), which was so large it had to be subdivided into four quadrants for adequate coverage. There appeared to be a correlation between human population/buildings and the number of Common Nighthawks, with the numbers of birds detected increasing with the urban areas surveyed. However, it was not a linear correlation as three birds were detected in Gladwin with sixty-five detected in the entire Iowa City area. These birds are likely attracted to the available nesting areas and feeding opportunities associated with urban structures and extensive lighting.

Conservation Assessments of Three Paleozoic Plateau Natural Areas

Oral (Saturday, April 21, 2018)

Wayne Schennum John Pearson
Iowa Department of Natural Resources

The Driftless Area at the juncture of 4 Midwestern States is a unique island of deeply dissected unglaciated terrain where narrow stream valleys are bordered by steep ridges and rolling plateaus on dolomitic bedrock. Here native vegetation is best represented in mesic forests and algific talus slopes on steep north-facing slopes and dry limestone (dolomite) hill prairies on west- and south-facing slopes. Three Iowa Preserves were studied here in 2017. Solitaire Ridge is a 35 to 40 acre very high quality dry dolomite prairie above the Upper Iowa River owned by the Iowa Natural Heritage Foundation. A total of 102 native plants were observed are, one listed as threatened and 5 as special concern. Two special concern skippers occur here also. Malanaphy Springs (64 ac.) is a very rich, little-disturbed mesic forest with several seeps and dolomite cliffs. A total of 102 native species, many of which are conservative, were found here. At Bixby Springs, only a 2 to 3 acre algific talus slope imbedded in mesic forest was studied. This very high quality community has 64 native species, 56% of which of are conservative, including the threatened Northern Monkshood and several northern relics.

Resolving oddball reports of rare Iowa plants

Oral (Saturday, April 21, 2018)

John Pearson
Iowa Dept of Natural Resources

During an effort to update the list of Endangered, Threatened, and Special Concern plants in Iowa, I investigated reports of rare species whose sources were unclear or whose occurrences appeared out of range. Herbarium searches revealed that all specimens for Alisma gramineum had been annotated to A. subcordatum after publication of the state checklist (Eilers & Roosa 1994); likewise, all specimens of Asclepias engelmanniana had been recently annotated to A. stenophylla. Melica mutica lacked a voucher specimen for its lone literature report, but had been recorded in 1898, prior to that taxon being split in 1905 into two species with all Iowa specimens subsequently updated to M. nitens. The historic specimen for a fourth species, Lechea racemulosa, was correctly identified, but reexamination of its label revealed that it had been collected in Tennessee, not Iowa. Based on national range maps or historic records, seven species formerly considered native were determined to be adventive or introduced: Rosa palustris, Carex douglasii, Acalypha ostryifolia, Baptisia tinctoria, Trichostema dichotomum, Helenium amarum, and Cimifuga [Actaea] racemosa. Conversely, two species formerly considered non-native are now regarded as native: Crepis runcinata and Adlumia fungosa. This study underscores the importance of herbaria as sources of verifiable data.

Responses of the vegetation at Robison Wildlife Acres, Story County, to seven years of restoration management

Oral (Saturday, April 21, 2018)

Thomas Rosburg
Drake University

Robison Wildlife Acres is a 78-acre park located in southeast Story county managed by Story County Conservation. Upland soils occupy approximately 80% of the park; alluvial soils comprise 20%. Extant plant communities include oak-dominated forests, shrubland and grassland. In 2010, four 20x50 m permanent plots were established on four sites throughout the park to record baseline data on plant community composition. Management efforts over the next seven years were aimed at restoring woodland, savanna and prairie. Mechanical woody removal, prescribed fire and goat herbivory were used in various portions of the park. Plant community composition was recorded in 2017 on the plots and analyses completed to evaluate changes in the vegetation. Significant patterns exhibited across all sites included 1) an increase in the richness of native forbs, 2) an increase in the total density of low conservative native herbaceous species, 3) an increase in the total frequency of native graminoids, 4) a decrease in the total frequency of native woody species in the herb layer, 5) an increase in the diversity index for native herbs, and 6) a decrease in the diversity index of native woody species. Additional patterns of vegetation dynamics among and within sites will be discussed.

An update on the current status of the revision of the Iowa Coefficients of Conservatism and the Flora of Iowa

Oral (Saturday, April 21, 2018)

Thomas Rosburg Pauline Drobney Deborah Lewis John Pearson Dean Roosa Daryl Smith University of Northern Iowa Mark Widrlechner Iowa State University
Drake University

The application of coefficients of conservatism for native plant species to evaluate the quality of vegetation has been in use since 1979 following the publication of "Plants of the Chicago Region" by Floyd Swink and Gerould Wilhelm. The concept of plant conservatism is based on the precept that plant responses to modern anthropogenic disturbances occur along a gradient. Species that respond favorably to human disturbance are less conservative species, while highly conservative species require natural, pristine habitats. A draft list of coefficients for Iowa plant species was completed and made available to users in 1999. Over the last four years, we have been working to revise the coefficients to make them more accurate. Adjustments have been made for about 51% of the native species in Iowa. In most cases of adjustment, the coefficient either increased or decreased by 1 or 2 on a 1-10 scale. In a few cases, the modification decreased the coefficient by 5 or increased it by 7. A new field describing our confidence level in the coefficient's accuracy has been added to the list. The status of this ongoing work and its consequences for the Flora of Iowa will be discussed.

Survey of Native Bees of Iowa: Preliminary Results from a Remnant Tallgrass Prairie in Central Iowa

Oral (Saturday, April 21, 2018)

Isaiah Smith Paulina Mena
Central College

Pollinators provide essential ecosystem services to both crops and wild plants. However, recent concerns over the welfare of managed honey bee colonies and wild bees have resulted in calls for the evaluation of bee populations. Studies of the native bees of Iowa are limited, highlighting the importance of assessing the status of the local bee populations. Here we present preliminary results from a survey of native bee populations of Iowa. Collections were done monthly using bowls and aerial nets from July to October. These were done in three different kinds of environment: remnant prairie, planted prairie, and ruderal grassland. Specifically, we present the species richness and abundance of one of the sites surveyed, the Reichelt Unit of Rock Creek State Park in Jasper County.

Soil N availability can promote copiotrophic over oligotrophic growth in tallgrass prairie: Results from a culture-for-diversity study

Oral (Saturday, April 21, 2018)

Matthew Nieland Lydia Zeglin
Morningside College

Anthropogenic alterations to tallgrass prairie ecosystems, such as fire suppression and nitrogen (N) enrichment, alters N availability for soil-dwelling bacteria that have a vital role in supporting plant and other microbial growth by degrading recalcitrant and complex organic materials in the soil. Community composition and microbial biomass change as a result, suggesting shifts in copiotrophic (r-selection) and oligotrophic (k-selection) growth patterns. To determine whether prolonged land management practices have changed soil bacterial growth rates and efficiencies, growth curves and CO2 respiration were measured from bacterial isolates cultured from soil sampled from a 30-year field experiment of historical burning and N addition, as well as a recent N fertilizer application, from Konza Prairie Biological Station, Kansas, USA. 143 pure cultures representing 13 families within 6 bacterial (sub)phyla were isolated using seven different media types. Growth rates in more concentrated nutrient broth were higher in strains isolated from recently fertilized soils, and growth rates in dilute nutrient broth were higher in strains isolated from soils with the lowest N availability, as predicted. Variability in growth rates also increased in amended N plots.