

# Critical Habitat Assessment of the State Threatened Broad-Headed Skink

Allison Hullinger<sup>1</sup>, Zackary Cordes<sup>2</sup>, Daren Riedle<sup>2</sup>, and William Stark<sup>1</sup>

<sup>1</sup>Department of Biological Sciences, Fort Hays State University, 600 Park Street, Hays, KS 67601

<sup>2</sup>Ecological Services Section, Kansas Department of Wildlife, Parks, and Tourism, 512 SE 25<sup>th</sup> Avenue, Pratt, KS 67124

## ABSTRACT

The Broad-Headed Skink is a semi-arboreal species that inhabits deciduous forests of the southeastern United States. Eastern Kansas makes up the northwestern periphery of their range and thus serves as an important area for studying the conservation of the species. In order to better evaluate the conservation status of the Broad-Headed Skink and develop a Recovery Plan, critical habitat needs to be better defined. In 2016, we surveyed 117 sites at Marais des Cygnes Wildlife Area, Marais des Cygnes National Wildlife Refuge, and La Cygne Wildlife Area. We installed drift fences, performed visual encounter surveys, and conducted a habitat evaluation at each site. A total of 560 individuals were collected that represented 32 species and 39 Broad-Headed Skinks were observed. Critical habitat variables were assessed using a logistic regression where we found insignificant results. However, these results will help guide us into the final field season of this project where we hope to increase our sample size.

## INTRODUCTION

Many reptiles are listed as threatened or endangered at both the federal and state levels. Threats to reptile populations include habitat degradation, introduction of non-native species, pollution, disease, and climate change (Gibbons 2000). These threats can cause severe declines in reptile populations, including those of the Broad-Headed Skink (*Plestiodon laticeps*), which is listed as a threatened species in Kansas and protected under the Kansas Nongame and Endangered Species Conservation Act of 1975. Little is known about its habitat preference or natural history, though it has been documented to occur in oak-hickory forests along major rivers. The range of the Broad-Headed Skink in Kansas is restricted to the eastern counties, which also makes up the northwestern extent of its overall range. Individuals in these populations tend to have higher genetic diversity and thus are more suited to adapt to environmental changes. Studying populations in these areas are important in effectively conserving a species (Channell 2004).

In order to make choices concerning the status and conservation of the Broad-Headed Skink, a more in-depth study of its habitat needs to be done. We hypothesize that Broad-Headed Skinks occupy mature forests that provide a specific set of resources the skink prefers. The objectives of this projects are:

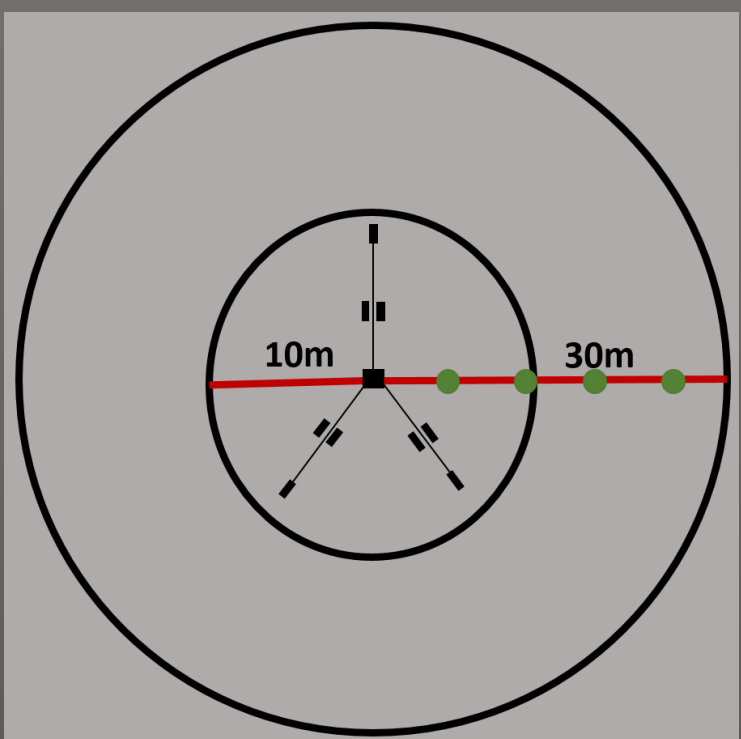
- Verify distribution of *Plestiodon laticeps* in 8 counties including historical sites but focusing on new locations.
- Develop a more defined critical habitat for *Plestiodon laticeps*.
- Develop a recovery plan.

## MATERIALS AND METHODS

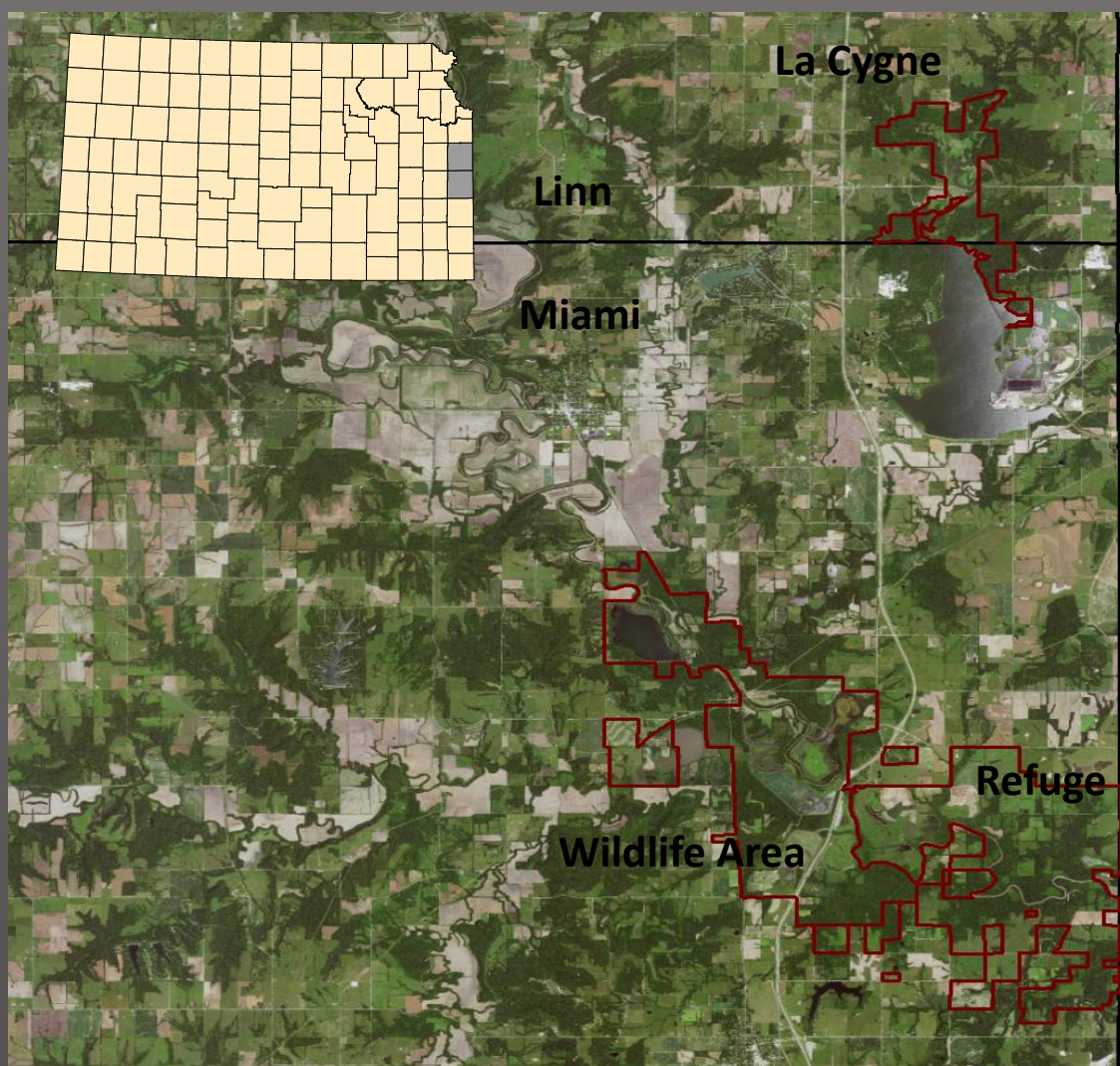
In 2016, we surveyed a total of 117 sites at Marais des Cygnes Wildlife Area, Marais des Cygnes National Wildlife Refuge, and La Cygne Wildlife Area. Different habitats were targeted, and communities were assessed through the use of drift fence arrays and visual encounter surveys. A drift fence array consists of three 25' fences and 10 funnel traps. Traps were located at the end of each fence, the middle of each fence on both sides, and one in the center of the array. Traps were checked and processed every morning. A visual encounter survey was performed within a 30m radius of the center trap.

A habitat analysis was also performed. One meter squared Quadrats were placed along two random transects within the array to assess percent shrubby cover, percent soil exposure, and litter depth. The array was then divided into quarters and the distance from the center of the array to the nearest overstory tree, understory tree, and fallen log in each quarter were measured. The diameter of these variables and length of all fallen logs in the quarter were also measured (Dueser 1978). All tree species with a 15cm diameter at breast height or larger were recorded.

A logistic regression was performed to determine the significance of habitat variables on Broad-Headed Skink presence.



**Figure 1.** A representation of how each site is set up and assessed.



**Figure 2.** Target areas from 2016 in Linn and Miami counties.



## RESULTS

A total of 560 individuals were collected that represented 32 species. 39 Broad-headed Skinks were collected from these sites; 16 from Marais des Cygne Wildlife Area, 5 from Marais des Cygne National Wildlife Refuge, 9 from La Cygne Wildlife Area.

The Intercept p-value from the logistic regression was 0.0868 with the significance level set at 0.05. There was one variable, Overstory Tree Size, close to being significant with a p-value of 0.0521.

## DISCUSSION

The intercept p-value from the logistic regression was above the significance level meaning that my model is not good at predicting where a Broad-Headed Skink may occur. However, the variable Overstory Tree Size was very close to being significant. Overstory Tree Size is a measure of the diameter of the tree and can be used to determine the age of the forest. We hypothesize that Broad-Headed Skinks occupy more mature forests and these results are starting to support this hypothesis.

While these results were statistically insignificant, they serve an important purpose in guiding the final field season of this project in the summer of 2017. First, we need a larger sample size. A logistic regression is powerful, but offers the best results when there are 50 cases or more. We also sampled sites that may be too close together and don't offer enough variation in habitat variables. This will be addressed as we survey other sites throughout the range of the Broad-Headed Skink in Kansas.

## LITERATURE CITED

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