Final Report to the:
Illinois Department of Natural Resources for Illinois Wildlife Preservation Fund Grant Agreement #12-018W

Project Title:
Survey and Status of the Eastern Massasauga (*Sistrurus c. catenatus*) and Kirtland's snake (*Clonophis kirtlandii*) at Allerton Park, Piatt County, Illinois

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Submitted by:
John D. Griesbaum
Natural Areas Manager
Allerton Park & Retreat Center
University of Illinois
515 Old Timber Road
Monticello, IL 61856
217-333-3287 x208

ALLERTON
PARK & RETREAT CENTER

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INTRODUCTION

At the time of European settlement, the Eastern Massasauga Rattlesnake, *Sistrurus catenatus catenatus*, (EMR) was distributed throughout the northern two-thirds of Illinois. Early inhabitants of the state reported seeing up to 20 or more EMR in one season (Hay, 1893). The habitat conversion that followed settlement, such as draining of prairie marshes and intensive agriculture may have contributed to the EMR's decline. As early as 1866, the EMR was noted as declining (Atkinson and Netting, 1927). In 1994 the EMR was listed as an endangered species in Illinois (Herkert, 1994) and is now a candidate for listing at the federal level (USFWS, 1999). The persecution of the EMR by the unenlightened, uninformed human population has lead to only a few widely scattered populations remaining. Smith (1961) stated that there were 25 extant populations of the EMR at that time. Recent studies have found that only two to five of the previous 25 remain (Beltz, 1992). One of these occurs at Allerton Park, near Monticello, Illinois.

The Kirtland's snake, *Clonophis kirlandii*, (KS) also abundant at the time of settlement has suffered serious declines over the past century. The KS is distributed through the middle one-third to the northeast corner of Illinois (Phillips *et al.,* 1999). Garman (1892) stated that tiling, ditching and cultivation of the soil have nearly destroyed its habitat. The KS is listed as threatened in Illinois and Ohio and endangered in Indiana and Michigan. The KS is offered no protection at the federal level. A total of 70 historical localities are known in Illinois; a 1985 survey found individuals in only 20 of these sites (Wilsmann and Sellers, 1988). One of these localities is Allerton Park, near Monticello, Illinois. Between June, 1991 and May, 1993, 33 historic locations were surveyed and KS were encountered at only two, Effingham and Lake Sangchris (Bavetz, 1994).

The objectives of this study were to 1) determine the status of the EMR and KS at Allerton Park through visual encounter searches 2) Survey sites where the eastern massasauga and kirtland's snake are known to occur.

MATERIALS AND METHODS

Study Organisms

Eastern massasauga rattlesnake: The EMR has a range that includes the states of Illinois, Indiana, Iowa, Michigan, Missouri, New York, Ohio, Pennsylvania, Wisconsin, and across the Canadian border into the province of Ontario. Preferred habitat of the EMR ranges from lowland forest and grasslands in the midwestern United States and western Great Lakes to mixed deciduous/coniferous forest in Ontario to peat bogs in New York (Wright, 1941; Smith, 1961; Reinert and Kodrich, 1982; Seigel, 1986; Weatherhead and Prior, 1992; Johnson and Leopold, 1998). The EMR has four activity periods. Emergence (egress) begins when the snake leaves its hibernacula to thermoregulate adjacent to the entrance, occurring late March to mid-April and ending when the snake leaves the vicinity of the hibernacula. The primary activity period begins when the snake moves to its foraging area and ends when the snake moves back to the vicinity of its hibernacula area, approximately mid-October. Entrance (ingress) involves the snake locating a suitable burrow. The snake may shuttle between several crayfish burrows until

a suitable one is found concluding this period. Winter dormancy ends the season for the EMR. During this period, the snake remains underground, in the burrow, until mid-March to mid-April. The primary activity period is punctuated by mating season, mid-July through August.

Kirtland's snake: The KS range includes the states of Ohio, Indiana, extreme southern Michigan and extreme northern Kentucky. A disjunct population occurs in western Pennsylvania and northeastern Missouri. The KS historically occurred in open habitats (Conant 1943). This includes wet grasslands, margins of streams, lakes, swamps and meadowlands. Present habitat consists mainly of open low grassy areas at the margins of creeks, ponds or ditches (Bavetz 1994). Populations at the periphery of the range occur in relatively open woods while those in the core are more commonly found in urban or floodplain habitats (Conant 1943). Life history information is lacking on the KS, but what little exists states that the KS is very secretive and most likely nocturnal, possibly aestivating during the hotter part of the summer (Conant 1943, Smith 1961).

Study Site

Allerton Park, located SW of Monticello Il, was donated to the University of Illinois by Robert Henry Allerton in 1946 for use as an educational and research center (Fig. 1). The park's 1500 acres contain woodland, riparian and prairie areas of such high quality they have been designated a National Natural Landmark. We searched for snakes at two locations: 1) the prairie restoration site in Robert Allerton Park and 2) Heartland Pathways along old Rt. 47(Fig. 1).

Survey Methods

Snakes were collected using visual encounter surveys and drift fences. Visual encounter surveys were conducted in early spring during egress at the Heartland Pathway site. Surveyors walked areas were surface vegetation had been removed using prescribed burning, checking under cover objects such as logs, grass clumps, and debris. The burned area was searched more intensively due to higher detection probabilities in areas where vegetative cover has been removed. The drift fence array was constructed in an X configuration. Each leg of the array was ~150 ft. Funnel traps (n=48) were placed at regular intervals on opposing sides of the fence. Drift fences were checked everyday during the activity season after visual encounter surveys had ceased (mid-May through November 1).

All eastern massasauga and Kirtland's snake were sexed by cloacal probing and weighed to the nearest gram with a Pesola spring scale. Snout vent length (SVL) was obtained using the average of three measures within 0.5 cm with a flexible tape. Tail length was determined by measuring to the nearest 0.5 cm with a ruler. All morphological data was stored in an electronic database at the Illinois Natural History Survey.

For VES snakes, recorded environmental variables were amount of cloud cover and presence/intensity of precipitation, shaded air temperature (to the nearest 0.1 ºC), relative humidity and max wind speed were determined with a Kestrel 3000. Substrate

temperature ~1cm below the surface (to the nearest 0.5 ºC) using a Fieldpiece digital thermometer.

RESULTS

Visual Encounter Surveys

2012

The prairie restoration and Route 47 was searched for 87.17 man-hours. No EMR or KS were encountered.

Snake species encountered included *Storeria dekayi* and *Elaphe vulpina.*

Drift Fence Surveys

Drift fence arrays were installed spring 2012. Surveying took place over a period of 9984 trap nights. There was a single KS encountered.

Other snake species encountered included *Elaphe vulpina* (n=2), *Storeria dekayi* (n=5), *Thamnophis sirtalis* (n=5).

RECOMMENDATIONS

Maintaining a high level of search effort and continuing to conduct prescribed fires while snakes are still in hibernacula will aid in encountering additional EMR and KS and recapturing known snakes. Recaptures are important for estimating population size and survivorship. Furthermore, conducting stewardship activities that maintain, increase or enhance Allerton's grassland habitat would benefit both species of snake. Surveys should be expanded into additional areas of Allerton, where suitable habitat exists, to determine the extent of EMR and KS occurrence within Allerton Park. Overall, it is recommended that agricultural lands adjacent to Allerton Park be restored to natural prairie habitats through conservation easements or outright purchase.

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PLATES

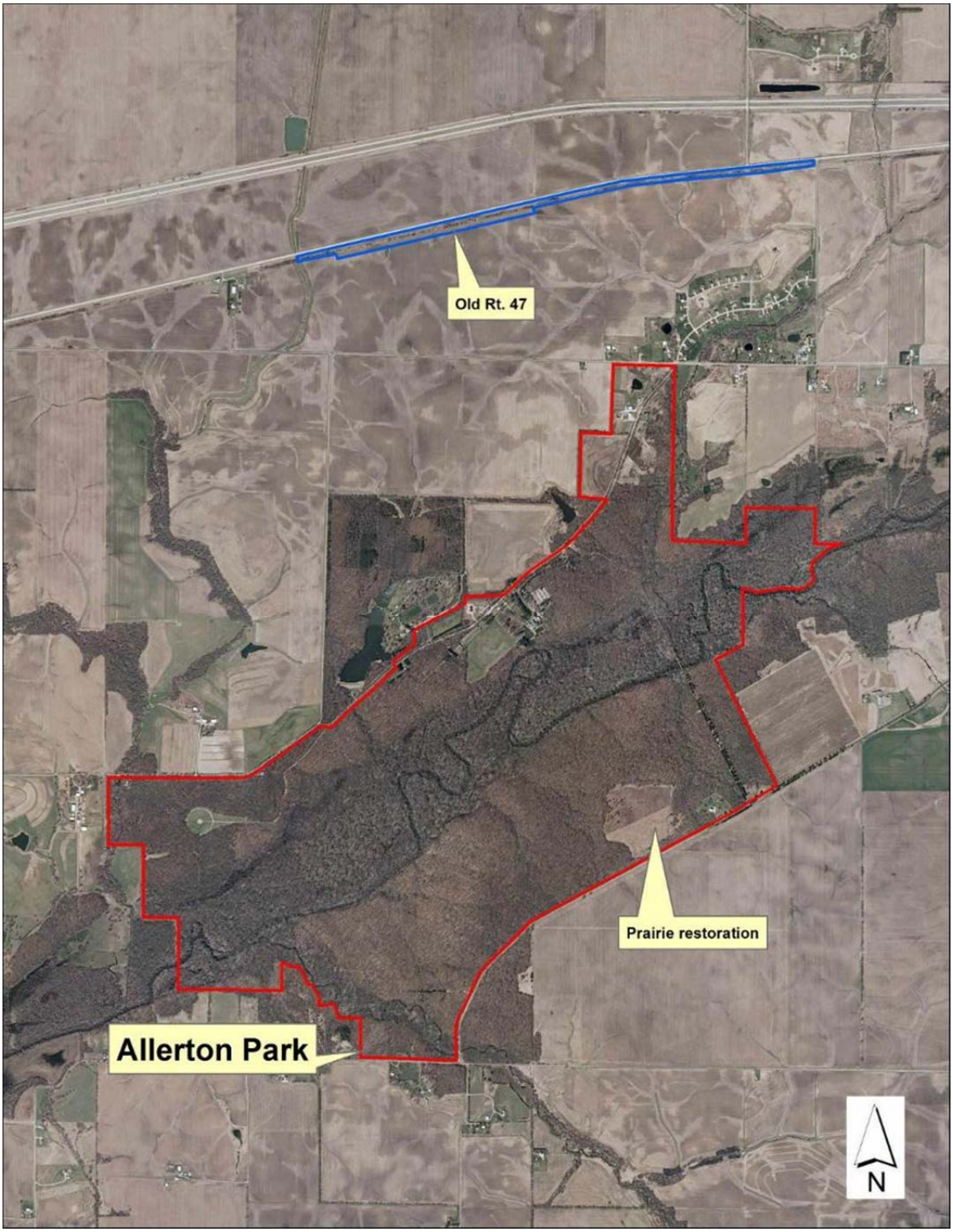

Figure 1: Aerial photograph illustrating location of Allerton Park and Heartland Pathways – Old Rt. 47.

PICTURES

PROMOTION

Allerton gets DNR grants to survey snake population, remove plants

By KELLEY HEANEY
Journal-Republican correspondent

Beautiful Allerton Park seems to be losing snakes, so it plans to conduct a survey to determine a more precise number of Eastern Massasauga Rattlesnakes and Kirtland's Snakes who live there. The park is using a $2,000 grant funded by the Illinois Department of Natural Resources (IDNR) with contributions to the Illinois Wildlife Preservation Fund. This grant will allow the park to not only use a visual encounter survey method but also to build drift fence lines and use traps in an attempt to determine if these endangered snakes are still in the area.

Known as "the seldom seen snake," the non poisonous Kirtland's snake has been found occasionally on the park grounds in recent years, including one run over by a car on the entrance road last fall. This snake has a diet consisting mostly of earthworms and likes to live in holes crawfish dig out along the edge of the water. It can flatten itself making it harder to see than most snakes. It is listed as endangered in Indiana and Michigan while it is considered threatened in Illinois and Ohio.

The Eastern Massasauga rattlesnake, however, has not been spotted in the park for the past four years. As an endangered species in the state of Illinois, it could soon be added to the Federal Endangered species list. If that happens, Allerton Park could receive federal funds to help protect it if there is evidence that the snake still survives in the area. According to John Griesbaum, the Natural Areas Manager at Allerton Park, sightings of the rattlesnake in the past ten years have only been recorded at Allerton, Carlyle Lake, near St. Louis, and Warren County, in the northern part of the state. Although it is considered poisonous, there have been no documented human deaths caused by the snake in the past forty years in Illinois. It too likes to live along waterways but also inhabits wooded areas, bogs, and prairie marshes and are often found under logs and rocks.

Responsible for controlling the population of a number of small mammals, the rattlesnakes are an important part of the eco system at the park, even if many people don't like them, and so they are worth trying to save. Griesbaum said that just being a native part of the local environment made it worth the work of counting and protecting them.

Counting the snakes, or a Visual Encounter Survey, will be done in the early spring following prescribed burns in the southern part of the park's prairie restoration area. The burns will clear debris and old foliage from the area and with little or no ground cover the snakes will be easier to find as they try to warm themselves in the spring sunshine. A second survey will come later in the year with drift fence arrays, which is when a fence line is used to herd and funnel snakes to traps to be counted.

A second grant was also obtained by the park through the IDNR's Illinois Wildlife Preservation Fund. This one will be used to help eliminate exotic vegetation species and help restore the area to the natural plants that were found in the area prior to the arrival of settlers. Griesbaum plans to purchase hand tools such as soil knives, loppers, and back pack sprayers for volunteers to use to reduce the number of foreign plants in the area. This will help to leave resources for the native vegetation. "This area has some of the highest quality bottom forest land in the state of Illinois with a lot of old growth in several areas. We want it to look like it would if no Europeans had settled in the area," said Griesbaum.

The park staff applied for the grants last spring, and received notification they would receive them earlier this fall. The projects will begin in the spring as the weather clears and the prescribed burns can begin to clear away some vegetation. Volunteers will be needed for both projects.

Griesbaum, who has worked at the park for a little more than a year, says that this is the first time that the park has applied for these state grants. He believes the money will be put to good use and that the public will benefit from the results of the projects.

Allerton Park gets two $2,000 IDNR grants

Allerton Park has recently been awarded two grants from the Illinois Department of Natural Resources from contributions to the Illinois Wildlife Preservation Fund. The two grants are worth $2,000 each.

One grant will be used to conduct surveys for the state endangered eastern massasauga rattlesnake and the state threatened Kirtland's snake found in various natural areas of the park.

The other grant will be used to purchase tools that volunteers will use for exotic species management at the park.