

Federal Program: **ENDANGERED SPECIES-WILDLIFE DIVERSITY**
USFWS Region 3 - Section 6 Funds
Illinois Department of Natural Resources - Office of Resource Conservation

Grant Proposal

Project Title: Response to Habitat Management by the Eastern Massasauga (*Sistrurus catenatus*) at Carlyle Lake, Illinois

Principal Investigator/Contact Person: Dr. Christopher A. Phillips
Center for Biodiversity
Illinois Natural History Survey (INHS)

Grantee Name: Illinois Natural History Survey/University of Illinois

Funding Request for this Proposal: \$34,673.00

The total project cost is: \$46,231.00. This qualifies for a 75/25 match. Therefore: \$34,673.00 (75%) will come from the FWS and the remaining 25% (11,558.00) will come from IDNR/INHS staff time and University of Illinois overhead/indirect costs.

Project Justification:

Carlyle Lake has been recognized as one of the last strongholds for the massasauga rattlesnake (*Sistrurus catenatus*) in Illinois. A cooperative effort between Scott Ballard of the Natural Heritage Division and personnel at Eldon Hazlet State Park and Army Corp of Engineers (ACE) property at Carlyle Lake resulted in approximately 75 sightings of the massasauga in the southern three-quarters of the lake between 1991 and 1998. Most of these sightings were associated with human activities; a few have been the result of road mortality or incidental contact with park personnel. In 1999 I started a mark recapture study on the Carlyle populations of the massasauga that has continued uninterrupted to the present. We also conducted intensive radio-telemetry on the massasauga at Carlyle from 2001 to 2003. These studies resulted in a much clearer understanding of habitat use of the massasauga at Carlyle.

Much of the habitat around Carlyle Lake used by massasaugas has been drastically altered. For example, invasion of autumn olive (*Elaeagnus umbellata*), an exotic shrub introduced to provide food and cover for wildlife, has resulted in the loss of open canopy habitats required by the massasauga. Many areas within South Shore and Eldon Hazlet State Parks that were open fields and pastures twenty to thirty years ago have become overgrown with autumn olive and are now less suitable for massasaugas. Small-scale autumn olive removal was initiated in Fall 2001 and has continued to the present. In 2007, the staff of Eldon Hazlet State Park will initiate large-scale autumn olive removal at sites adjacent to known massasauga habitat and hibernacula.

In addition, within Eldon Hazlet State Park, two fields (18 and 10 acres) previously in agriculture were converted to prairie in Spring 2001 to provide additional habitat for the massasauga. Both of these areas are adjacent to existing massasauga habitat and hibernacula.

Our previous research showed limited use of autumn olive thickets by massasaugas. This proposal seeks funds to survey the autumn olive thickets for massasaugas before and after the large-scale removal. We also propose to continue surveying the recently converted agricultural fields for massasauga use.

Study Area

The study area includes all of South Shore and Eldon Hazlet State Parks.

Duration of the Project

This study will take place from 30 October 2006 through 30 October 2007. ✓

Project Objectives: During seven years of spring searching, I have identified over 375 individual massasaugas from 12 major sites at Carlyle. The data collected have allowed me to estimate habitat use and movement patterns. This research will document use of the autumn olive thickets by massasaugas before and after clearing and restoration.

Project Methodology:

The main techniques used in this project will be Visual Encounter Surveys (VES). From one to four searchers will walk through the study areas looking for snakes during the six-week egress period (approximately March 15 to April 30). In addition, cover boards will be placed at sites scheduled to be cleared of autumn olive. This will extend our ability to encounter massasaugas beyond the end of the egress period. The cover boards will be checked once daily during the egress period and once weekly from the end of egress until October 30.

Each snake will be individually marked with a small identification tag (PIT Tag) that is injected into the body cavity with a hypodermic needle. A small sample (50 to 75 μ l) of blood (for future genetic and health analysis) will be taken from the caudal vein using a sterile needle. Each snake will be measured and weighed and released at the site of capture. The following information will be recorded at each massasauga location:

- 1) Location coordinates using a Global Positioning System (GPS) with 4-meter accuracy.
- 2) Date, time of day, air temperature at ground level, weather variables (sunny, cloudy, raining, etc.).
- 3) Activity of the snake, position, direction of travel if moving, light conditions (in shade, partial sun, or full sun).
- 4) Description of habitat structure in a 1 m² plot centered on the snake's location. Sixteen variables (mostly plant community structure) will be quantified in each plot.

Home ranges and habitat use will be estimated using Geographic Information Systems (GIS) software and vegetation data layers that we have already assembled for the study areas.

Detailed Budget:

PERSONNEL	Cost	
Graduate Research Assistant	\$24,677.00	
Field Assistants	\$4,387.00	
SUBTOTAL		\$29,064.00
BENEFIT BENEFITS		
Fringe - Non-Student No SURS	\$410.00	
Fringe - Graduate Student	\$1,768.00	
SUBTOTAL		\$2,178.00
MATERIALS/SUPPLIES		
Plywood Panels - Cover boards (½" 4' x 8')	\$750.00	
PIT Tags	\$500.00	
Pillowcases	\$250.00	
Miscellaneous Supplies	\$2,000.00	
SUBTOTAL		\$3,500.00
TRAVEL		
Lease of UI Motorpool vehicle	\$1,200.00	
Mileage for personal vehicles/INHS fleet vehicles	\$2,886.00	
Travel to national conference	\$700.00	
SUBTOTAL		\$4,786.00
CONSTRUCTION		
SUBTOTAL		\$2,500.00
TOTAL DIRECT COSTS		\$42,028.00
INDIRECT COSTS		\$4,203.00
TOTAL COST OF PROJECT		\$46,231.00

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Budget Justification

Wages and Salaries: The graduate student will be someone with at least two years experience conducting VES of massasaugas and will be paid at a rate of \$1,800.00/month for 12 months. Two assistants will be paid at a rate of \$10.00/hr for six weeks. I will also search with the student and assistant. The PI is paid by department operating funds and is at no cost to the sponsor.

Benefits: As determined by the University of Illinois. Graduate student fringe rate is 7.04% during the non-summer months and 14.69% during summer months.

Materials and Supplies: Miscellaneous supplies includes batteries, digital film (digital media such as CompactFlash, SD Media, etc.), waterproof paper, pens pencils, nail polish, rulers, flexible measuring tapes, curatorial supplies (vials, jars, alcohol), spring scales, calipers, pelican cases; first aid kit, water cooler, maps, flagging, snake probes, snake tubes, surgical adhesive, syringes, needles,

Travel: This will cover leasing a vehicle from UI Motorpool for the six-week search period and mileage for personal vehicles and INHS fleet vehicles for travel between Carlyle and Champaign during the extended cover

board work (300 mile round trip x \$0.37/mile x 26 trips). Travel to a national conference is estimated from previous experience.

Contractual Services: The most affordable lodging is a Lakeside Cottage at Eldon Hazlet State Park. The cost for one cottage the six-week searching period is approximately \$2500 and is considered Contractual Services, not Travel, by UIUC. In addition, I am requesting conference registration for one person to attend a national conference to present the results (\$250).

Indirect Costs: Calculated as 10% of direct costs (this may need to be adjusted as this is federal funding).

Source of Matching Funds

I have estimated my participation in this project as 8%. This can be used as match. The amount of the final indirect costs can also be used as match. Other possible sources include the discounted mileage rate (\$0.27/mile) of INHS fleet vehicles, and the use of PIT Tag readers that were purchased with State funds.

Illinois DNR Personnel: Joseph Kath with the Illinois DNR-Office of Resource Conservation will serve as the state project leader and will coordinate with other IDNR employees on this project.

Joseph Kath
Phone: (217)782-6384
E-mail: Joe.Kath@illinois.gov