

THE POPULATION STATUS AND HABITAT SELECTION OF THE TIMBER RATTLESNAKE (*Crotalus horridus*) IN EAST-CENTRAL ILLINOIS.

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Abstract

The timber rattlesnake, *Crotalus horridus*, is a top-level predator inhabiting the forests of eastern North America. Communal denning and anthropogenic alteration of suitable land surrounding den sites make *C. horridus* a vulnerable species to extinction or extirpation. Habitat alteration and fragmentation are believed responsible for population declines observed in 20 states, including Illinois where it is protected as a threatened species. Presently in Illinois, *C. horridus* is found primarily in association with the majority of the remaining forestland in the extreme southern portion of the state and along the Mississippi River bluffs. In this study, I determine the size of a relict population of *C. horridus* in Clark County, Illinois, and habitat selection by individuals in this forested island surrounded by row crop agriculture. Collected individuals are marked and implanted with transmitters that allow relocation and temperature monitoring throughout the activity season. I will describe their habitat and activity range (ha) in comparison to the various habitat types available. Through a better understanding of this species' activity and habitat selection patterns, I will be able to recommend an efficient management strategy for the conservation of this species in Illinois.



Fig. 1 – Timber rattlesnake (*Crotalus horridus*)

Introduction

- Over 90% of historical habitat types in Illinois have been altered, exacting a negative effect on the top predators in this state [6,7].
- In Illinois, *C. horridus* (Fig. 1) is found in forestland of the extreme southern portion of the state and along the Mississippi River border counties [9]. Populations of *C. horridus* have vanished from much of Illinois as land has been converted from forest to farmland (Fig. 2).
- A landowner survey, commissioned by the Illinois Department of Natural Resources (IDNR) in 2000-2001, compiled credible *C. horridus* sightings centering around an area in Clark County locally referred to as “Rocky Hollow” (Fig. 3).
- Habitat use in *C. horridus* has been described as dense deciduous forest with a great amount of leaf litter, relatively few fallen logs, and a relatively open canopy [2,3,4,12].

Purpose of research

- To locate and quantify a relict population of *C. horridus* in Clark County, Illinois.
- To determine the sex ratio and population sustainability (e.g., > 8 mature females; [3])
- To determine the location/structure of the associated communal hibernacula
- To determine the home range of individuals
- To determine habitat selection of individuals during the activity season.

Methods

- Collected individuals are marked:
 - > by clipping a unique combination of ventral scales [1].
 - > with a passive integrative transponder (PIT tag; [8]).
 - > with a radio-transmitter, surgically implanted into adult snakes [5,10] which will allow for relocations through the activity season. which include thermistors that provide snake core body temperature (± 0.5 °C).
- Their mass (± 0.1 g), snout-vent length (SVL; ± 0.5 cm), and tail length (TL, ± 0.5 cm) is recorded.
- Gender of each individual is determined using a cloacal probe.
- At initial capture and relocations:
 - > the coordinates of the snake's position is recorded using a global positioning system.
 - > general habitat features and microhabitat (1 m² plot centered on the snake) are assessed and compared to available habitat types and sizes (ha).
- Home range for each snake is calculated using the minimum convex polygon method [11], based on relocation data.
- Appropriate statistical analyses are applied to all data.



Fig. 2 – Photo showing the agricultural fields fragmenting and surrounding the forest habitat.

Results

- The IDNR landowner's survey documented rattlesnake sightings in the “Rocky Hollow” area as recent as 2001.
- Despite not finding *C. horridus* during the first season of searching, I found:
 - > 4 new county records.
 - > 14 post-1980 records [9].



Fig. 3 – A typical sandstone outcropping at the “Rocky Hollow” site.

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