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“Radiotracking Blanding’s Turtles (*Emydoidea blandingii*) for Conservation and Habitat Management”

Final Report

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Introduction

In 2009, Blanding’s turtles were upgraded from “threatened” to “endangered” in Illinois (Illinois Endangered Species Protection Board, 2011). Among 164 reptile and amphibian taxa, Midwest Partners in Amphibian and Reptile Conservation (Midwest PARC) ranked Blanding’s turtles in the highest prioritization category for level of concern and regional responsibility for survival (MWPARC, 2011). Blanding’s turtles are sensitive to habitat destruction and fragmentation, nest mortality, and collection. Urbanization and agricultural development threaten to destroy suitable wetland habitat (MWPARC, 2010). Raccoons present a major threat to nest survivorship (up to 43 – 93% mortality; Congdon et al. 1983), and raccoon populations increase tremendously in areas of human habitation (Prange et al. 2003). Females travel hundreds of meters to several kilometers overland before nesting (Beaudry et al. 2010), and risk road mortality, disturbance by predators, and collecting by hobbyists during these nesting forays. At the same time, Blanding’s turtles present a combination of life history traits that include high age of maturity and low offspring survival, which causes adult female survivorship to be the most valuable predictor of a population’s long-term viability (Congdon et al., 1993). Therefore, ascertaining and protecting the habitat where females roam is one of the most effective ways to maintain sustainable populations.

The Forest Preserve District of Kane County has purchased large tracts of formerly agricultural land on the western side of the county near Kaneland and Sugar Grove, some of this habitat historically inhabited by Blanding's turtles. After three years of intensive trapping at Hannaford Woods Forest Preserve, C. Milne-Zelman discovered two very large adult Blanding's turtles in 2011. Staff from Kane County Forest Preserve attached a radiotransmitter to the female in May 2011, and since then, with the purchase of radiotracking equipment from the Special Wildlife Preservation Funds Equipment Grant, C. Milne-Zelman has been collaborating in capturing and tracking female Blanding's turtles from this preserve.

Blanding's Turtles are a species evolved to exist in a prairie pothole wetland ecosystem but are found in other still or slow moving waters in lakes and rivers as well. The loss of prairie habitat and especially of large, unbroken blocks of this type of habitat with multiple and seasonal wetlands is a leading factor in their decline across most of their range. Hence, we are also using the radiotracking equipment from the Special Equipment Grant to track Blanding's turtles movements at Richardson Wildlife Foundation (RWF) in Lee County, Illinois. RWF has been actively restoring this type of habitat, which has certainly benefitted their small remnant population of Blanding's Turtles. The most limiting factor for Blanding's and other turtles in this region today other than habitat loss is nest and hatchling predation, primarily by raccoons. Raccoons occur in larger numbers in today's agricultural landscape than they did in the past. The quality of historic nesting sites for Blanding's Turtles at RWF may have diminished over the years as trees planted on sandy ground have matured and closed the canopy or briars and shrubs have increased underneath, both factors potentially making it more appealing to raccoons. Relatively open sandy soils can be a preferred nesting site for female turtles to use for egg deposition. Last year in the "Herpetological Survey" section of the RWF annual report it was noted that it would be good to encourage research on-site to identify some of the nesting areas being used by Blanding's Turtles so that the habitat could be managed accordingly. An opportunity to begin to try to answer this question came early this year when C. Milne-Zelman offered to loan the radio telemetry receiver and 2 transmitters while she conducted other field research out of state.

Methods

Kane County Forest Preserves

In April and May 2013, C. Milne-Zelman set extensive traps at Hannaford Woods Forest Preserve and Blackberry Maples Forest Preserves in Kane County, with the intention of catching female Blanding's turtles to track. From April 9 – April 14 2014 C. Milne-Zelman and Aurora University undergraduates set seven hoop traps to catch Blanding's turtles in Hannaford Woods, and C. Milne-Zelman radiotracked a female Blanding's turtle from her hibernation site to a wetland in Hannaford Woods Forest Preserve. In September 2014 C. Milne-Zelman and Aurora University undergraduates set four turtle traps in Blackberry Maples Forest Preserve.

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Dr. Milne-Zelman and 5 students in an independent study summer course came to the Foundation bringing the telemetry gear and additional turtle traps in early May to set traps, conduct visual searches, and test and practice with the equipment. In the following three weeks the RWF summer interns led the program, monitoring traps first thing in the morning. From May 9th to May 30th, 2014, Richardson Wildlife Foundation staff and volunteers used hoop nets (~84 trap nights) and visual searches to capture turtles. Turtles were marked with a pattern of unique identification notches in the margin of their shell, various size measurements were taken and estimates of their age recorded, based on the growth annuli on the scutes on their plastron (the plates on the underside of their shell). Radio transmitters were glued on the carapace (top of shell) on each individual and turtles were released at the site of their capture. Two female Blanding's turtles' movements were radiotracked at RWF from mid-May through early June.

Results

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We captured a new female Blanding's turtle at Hannaford Woods on April 30, 2013, as well as 24 painted turtles through the trapping efforts. This female is the third Blanding's turtle (and second female) captured at this site – and like the previous two turtles, this was a large individual with a plastron length of 241 mm and a carapace length of 275 mm. She has been affixed with a radiotransmitter provided by Kane County Forest Preserve and was monitored

along with other Blanding's turtles in the region by an Aurora University student for two summer internships through Kane County Forest Preserve during 2013 and 2014. Most of the information on the movements of the Kane County Blanding's turtles was taken during this internship using equipment from Kane County Forest Preserve, but C. Milne-Zelman did search for both females during April 2014 when the transmitter frequencies were made available by the Forest Preserve. One transmitter frequency (148.263) signal has not been picked up by researchers since summer of 2013. C. Milne-Zelman searched for this female in April 2014 at Hannaford Woods and did not pick up any signal. C. Milne-Zelman located the hibernation site of the other female (148.344) in a muskrat tunnel or in the mud of a bank of Blackberry Creek on April 7, 2014, and located her in a nearby wetland on April 12 and again in the same place on April 14, 2014. Straight-line distance between the hibernation site and spring wetland was about 457 meters (1,500 feet). This female's movements were then tracked by Kane County Forest Preserve for the remainder of the season by the Aurora University undergraduate intern.

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From May 9th to May 30th, 2014 we used hoop nets (~84 trap nights) capturing 2 Snapping Turtles *Chelydra serpentina* (both new captures) and 29 Painted Turtles *Chrysemys picta* (27 new captures and 2 marked in previous years). We did not capture any Blanding's in traps. We did, however capture 3 Blanding's Turtles that year by visual searches.

We captured a previously recorded male estimated at 30 years of age (measurements: CL 220 mm, PL 194 mm, CW 130 mm, CH 82 mm). That individual was captured and released twice: on 4/5/14 at Kingfisher Pond and 4/30/14 at Wigeon South Pond approximately 1 mile apart.

On 5/21/14 we captured an unmarked adult female Blanding's Turtle crossing Shaw Rd between Martin and Turtle Ponds just East of the RWF office Building. We estimated it to be 10-12 years old by growth annuli on the scutes of the plastron (measurements: CL 230 mm, PL 183 mm, CW 130 mm, CH 65 mm). This turtle was measured, palpated, marked, and released at the site of capture with radio transmitter # 148.243 glued to its carapace using gorilla glue. It was not noticeably gravid by palpation.

On 5/22/14 we captured another unmarked adult female Blanding's Turtle in Muskrat pond by visual observation and wading in for the capture. We estimated it to be 20-25 years old (measurements: CL 230 mm, PL 183 mm, CW 130 mm, CH 65 mm). This turtle was measured, palpated, marked, and released at the site of capture with radio transmitter # 148.223 glued to its carapace using gorilla glue. It was also not noticeably gravid by palpation at the time of capture.

Both turtles moved significant distances between release and the first attempt to locate them. Turtle # 148.223, released at Muskrat pond moved to Beaver pond, a straight line distance of 354 m over the 4 day interval between release and the first successful telemetry tracking. Turtle # 148.243 released near Turtle pond moved to Prairie slough, a straight line distance of 585 m over a 5 day interval. Two subsequent forays with the receiver showed little movement from either turtle. We followed each signal to the source, eventually finding a detached transmitter (# 148.223) at Beaver pond on 5/27/14 and recapturing the female on Prairie Slough (# 148.243) with the transmitter still holding on 5/29/14. Subsequent forays showed little movement from this transmitter which had also come detached at some point between the capture at Prairie Wetland on 5/29 and the eventual recovery of the transmitter from heavy vegetation on the pond bottom on 6/25/14.

Discussion

Kane County Forest Preserve

The large number of painted turtles we have captured provides a reference frame for the intense trapping efforts we have made to find Blanding's turtles – and after six years of total trapping efforts and hundreds of painted turtle captures, we have captured three Blanding's turtles. Despite our trapping efforts over the past three years at Blackberry Maples, we haven't observed or caught Blanding's turtles at this forest preserve. Neighbors have reported Blanding's turtle sightings at Blackberry Maples in the past, but we have yet to encounter any. It's possible there may be transient Blanding's turtles that enter into the forest preserve via a culvert and pond which connect to Blackberry Creek just off the preserve on the north side, and provide a possible corridor to other forest preserves in western Kane County. As such, improving and maintaining the connectedness amongst the forest preserves and wetlands can benefit this endangered species.

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While it was disappointing not to obtain more data on movements and nesting behavior, the process resulted in several positive outcomes. We demonstrated a “proof of concept” that the method could lead to the answers to the question of what ponds and areas of the property Blandings Turtles are using and where females choose to deposit eggs. Using a stronger and more durable epoxy to hold transmitters in place, we should be able to gather more information if in the future we’re able to conduct a similar study and are lucky enough to capture females in time for the nesting season. Knowing the proclivity of these turtles to move from wetland to wetland and observing which wetlands they chose after capture is valuable information for land management and future trapping efforts. The fact that we were able to capture two previously unmarked adult females, a sex and age class the population needs more than any other, was very gratifying as well.

Given the rarity of Blanding’s turtles, it’s not surprising that the effort to capture and track females requires a multi-year effort and collaborative approach. We plan to continue trapping and surveying efforts for the 2015 field season at both research sites.

Works Cited

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