The Distribution and Relative Abundance of Blanding's Turtles (*Emydoidea blandingii*) in Northern Kane County

Final Report

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INTRODUCTION

The Blanding's turtle (*Emydoidea blandingii*) is primarily an aquatic turtle using both permanent wetlands and smaller ephemeral wetlands; however terrestrial areas are vital habitat components as well, functioning as movement corridors and nesting areas. They are a long lived species (up to 70+ years) and exhibit delayed sexual maturity (14-20 years for females). Although the range of the Blanding's turtle is relatively widespread, many states list them as a threatened or endangered, suggesting that many local populations are vulnerable. This species has been adversely impacted by extensive loss and degradation of both wetland and upland habitats both historically and in present times, road mortality is also a serious threat to Blanding's turtle populations. In the State of Illinois the listing status of the Blanding's turtle was recently changed from threatened to endangered.

Loss of habitat and road mortality has been especially devastating in urban areas like the Chicago Metropolitan Area (CMA). Several Forest Preserve Districts, Conservation Districts and other agencies have researched Blanding's turtle populations in their jurisdictions and some continued to monitor and manage their local populations. The land holdings of the Forest Preserve District of Kane County (District) have increased significantly from approximately 7,000 acres in 1999 to approximately 18,000 acres at present. Although Blanding's turtles were historically known to be present in Kane County, there was little information regarding their distribution on District lands prior to the initiation of this project.

PROJECT OBJECTIVES

The primary objective of the project was to determine the presence or non-detection of Blanding's turtles at selected District properties in northern Kane County. Information regarding Blanding's turtle distribution would benefit the District by allowing more informed decision making regarding site management, recreational use and future land acquisition. These data would furthermore provide updated Element Occurrence Records (EOR) to the Illinois Natural History database Program, which will benefit decision making beyond the boundaries of District lands.

The secondary objective of the project was to individually mark captured individuals and collect demographic data. Unique marking would allow us to determine relative abundance among the sites. Basic demographic data would contribute to the regional knowledge of Blanding's turtles in the Chicago area and will be used to guide future research and management activities in Kane County.

COMPLETED PROJECT DESCRIPTION

Grant funds were requested to purchase additional equipment for site inventories of several District properties. With grant support the District was able to purchase 30 hoop traps (6 large, 24 small) that were vital for the completion of the site inventories. All sites in the grant

agreement were sampled for the presence of Blanding's turtles; and 2 additional sites were also sampled during the project period. Locations of occurrence were reported to the Illinois Natural Heritage Database via Element Occurrence Records (EOR). Genetic samples were provided to an ongoing graduate research project in collaboration with FPD Cook County and FPD DuPage County. Preliminary project findings were presented at a Chicago region Blanding's turtle workshop at the Brookfield Zoo. These data will be used to guide future land management activities and other activities at the District as well as guide upcoming research activities.

METHODS

Sites were sampled on at least 2 occasions per year during 2009-2010, with the exception of Schweitzer Woods, which could not be sampled in 2009 due to time constraints. Sampling occurred from May to October and trapping sessions generally lasted 4 consecutive nights.

Large (24" diameter x 4' feet long) and small (12"diameter x 24" long) hoop traps were baited with sardines and placed in appropriate microhabitat to maximize the likelihood of turtle capture. Traps were checked every 24 hours and removed at the end of each sampling session.

Captured Blanding's turtles were marked using one or both of the following methods: uniquely numbered carapace notches and P.I.T tags. The approximate age class and sex of each turtle was determined and basic morphological measurements were collected (e.g. weigh, carapace and plastron length). When possible, a blood sample or tail clip was collected for genetic analysis. Selected individuals were fitted with transmitters and tracked via radio-telemetry.

RESULTS

Sampling was conducted at 4 of 5 sites from May-September 2009 and 5 of 5 sites from May-July 2010 (Table 1). Two additional sites not included in grant proposal (Dick Young and Freeman-Oury) were sampled in 2010. Sampling was conducted for 476 trap-nights (TN) in 2009 and 350 TN in 2010.

Blanding's turtles were captured at 4 of the 7 sampled sites, and a single individual was observed and documented at a site where Blanding's turtles were not captured via trapping (Table 2). Twenty five Blanding's turtles were captured in the two field seasons. The number of individuals captured ranged from 1 (Freeman-Oury) to 14 (Pingree) (Table 2). Overall, 11 individuals were male and 14 were female (Appendix A). Sixteen individuals were classified as adult based on weight and morphological features, 9 were juveniles or subadults (Appendix A).

Capture rate (Blanding's turtles/100TN) was used as an index of relative abundance. The total sampling effort across all sampling sessions was used to calculate a capture rate for each site. For the relative abundance comparison, Freeman, Freeman-Tomo and Freeman-Oury were treated as a complex of sites (hereafter Freeman complex). Capture rate ranged from 0 to 4.78 Blanding's turtles/100TN. At sites where Blanding's turtles were captured, capture rates were

1.74 Blanding's turtles/100TN at Burnidge, 2.51 Blanding's turtles/100TN at the Freeman Complex and 4.78 Blanding's turtles/100TN at Pingree.

Table 1. Summary of sampling effort for turtle surveys at selected Forest Preserve District of Kane County properties during 2009-2010.

	Number of trap-nights	
Site	2009	2010
Pingree Grove	179	114
Freeman	161	90
Freeman-Oury	0	50
Freeman-Tomo	33	24
Burnidge	103	12
Dick Young	0	23
Schweitzer Woods	0	22
Total	476	350

Table 2. Summary of the species and number of captures during turtle surveys at selected Forest Preserve District of Kane County properties during 2009-2010.

	Apalone spinifera		*Chelydra serpentina*		*Chrysemys picta*		*Emydoidea blandingii*[*]	
	2009	2010	2009	2010	2009	2010	2009	2010
Pingree	0	0	5	12	11	4	10	4
Freeman	0	0	10	8	22	8	7	1
Freeman-Tomo	0	0	4	2	13	13	0	0
Freeman-Oury	NA[1]	0	NA	10	NA	6	NA	1
Burnidge	0	0	7	3	28	1	2	0
Dick Young	NA	1	NA	20	NA	22	NA	0**
Schweitzer	NA	0	NA	1	NA	0	NA	0

*Individuals were marked, therefore the number of Blanding's turtles represent the number of distinct individuals captured at a site.

**Although there were no captures, there was one reliable observation of an adult Blanding's turtle in 2010.

[1]NA = Not applicable because the site was not sampled in that year.

DISCUSSION

The capture of Blanding's turtles at 4 of the 7 sites sampled was encouraging, as was the observation of an individual at a 5th site (Dick Young). The only site with no evidence of Blanding's turtle presence was Schweitzer Woods a 156 acre site with limited wetland habitat (20.1 acres). Upon sampling the site, it was evident that the limited amount of wetland habitat was of marginal suitability for Blanding's turtles. Although there were no captures at Freeman-Tomo, Blanding's turtles were captured at two adjacent sites and a radiotagged turtle overwintered on the site in 2009.

Overall the numbers of turtles captured at the sites were low, however, sampling effort was limited and more individuals may be captured with increased effort in the future. With the exception of Burnidge, where all captured individuals (n =2) were male, the sites had both adult males and females present. The capture of juveniles at two sites is evidence of recent natural reproduction, as the District has never utilized headstarting. These data are too limited to make strong inferences about the demographic patterns and population structure of these turtle populations. More research will be required to determine the status of these populations.

At recent conferences and workshops in the region researchers and managers discussed the importance of identifying each agencies most viable or "flagship" populations. Burnidge had the lowest capture rate among sites where Blanding's turtles were captures, additionally there were no captures of adult females or juveniles. There are only 63 acres of wetland habitat scattered across Burnidge, and this site is heavily used and bisected by numerous multi-use trails. The second highest capture rate was at the Freeman Complex, which is 1040 acres overall, with approximately 257 acres of wetland habitat distributed across the site. Pingree had the highest capture rate and the most juvenile captures; this 394 acres site has approximately 121 acres of wetland habitat. The capture rates and presence of juveniles at the Freeman Complex and Pingree would suggest that these sites may contain the "best" populations on District lands, but the data are too preliminary to gauge the viability of the populations.

This project has been highly beneficial to the District and the IDNR. The District has benefited greatly by learning about the distribution of Blanding's turtles on our lands, which will allow us to manage and improve habitat to benefit and protect this species. This knowledge will also guide future research to learn more about the populations of Blanding's turtles present in Kane County. This project has provided up to date occurrence data to the Illinois Natural Heritage

Database program, which may be used in decision making beyond the boundaries of the District. Finally, the information from this project has also been shared with other regional managers of Blanding's turtles including IDNR staff who are working towards a species recovery plan for Illinois.

Total Project Expenditure Summary

Budget Category	Project Total	Grant Funds Requested	Cost Share
Personnel	$5319	$0	$5319
Travel	$0	$0	$0
Equipment	$678	$614	$64
Materials/Supplies	$0	$0	$0
Contractual Services	$0	$0	$0
Other	$0	$0	$0
Total	$5997	$614	$5383

Actual expenditures for personnel ($5319) were lower than the estimated cost in the original grant application ($8568). The personnel expenses were overestimated because it was unclear how many sites could be trapped concurrently prior to project initiation. Several of the sites close together, which allowed efficient sampling.

All cost share funds were supplied by the Forest Preserve District of Kane County. Invoices for all materials and services purchased during the timeframe of the grant agreement are attached (Attachment A). The District respectfully requests payment of $614 to cover a portion of the turtle nets purchased to complete this project.

Project Expenditures Summary Tables

Personnel

Title	**Hourly Rate**	**Hours**	**Total**
Wildlife Biologist	$45.00	71	$3195
Wildlife Intern	$18.00	118	$2124
Total			$5319

Equipment

Description	Price/Item	Quantity	Total
Nylon Turtle Trap 2.5ft steel hoop, 2 in sq. mesh[1]	$57.00	6	$342
Promar TR-503 24" x 12" collapsible traps[2]	$14.00	24	$336
Total			$678

[1]Purchased from: Nichols Net & Twine Inc: 2200 Highway 111, Granite City, IL 62040
[2]Purchased from: Strictly Fishing and Archery: 401 Earl Rd., Shorewood, IL 60404

APPENDIX A

Sex and measurement data for all Blanding's turtles captured in surveys at selected Forest Preserve District of Kane County properties during 2009-2010.

Turtle Number	Sex	Weight (kg)	Carapace Length (mm)	Carapace Width (mm)	Plastron Length (mm)	Plastron Width (mm)
BURN#1	Male	1.81	240	unknown	221	119
FRE#1	Female	0.58	160	107	157	84
FRE#2	Female	0.26	142	87	123	71
FRE#3	Male	unknown	230	150	205	110
FRE#4	Male	unknown	243	156	229	120
BURN#2	Male	1.93	236	158	212	119
PIN#1	Male	1.62	232	152	211	110
PIN#2	Female	0.88	193	125	184	100
PIN#3	Female	1.36	220	140	211	120
PIN#4	Male	1.51	231	150	207	109
PIN#5	Female	1.59	230	144	216	120
PIN#6	Male	2.32	257	165	240	132
PIN#7	Male	1.87	260	165	230	116
PIN#8	Female	0.19	120	82	112	61
FRE#5	Female	0.10	92	70	85	46
PIN #9	Male	1.62	246	159	218	113
PIN#10	Female	none	231	159	224	124
FRE#6	Male	none	181	126	172	96
FRE#7	Female	1.47	223	143	214	111
PIN#11	Male	0.23	114	81	115	64
PIN#12	Female	0.10	89	67	84	46
FRE#8	Female	1.91	234	160	230	120
PIN#13	Female	0.26	123	87	122	68
FRE#9	Female	0.41	142	103	142	72
PIN#14	Female	0.46	68	53	62	31

Attachment A:
Invoices for Materials Purchased During Grant Period

Attachment B:

Photos from grant field work.