

Characterizing a newly discovered Blanding's Turtle Population



Final Report to Nova Scotia Habitat Conservation Fund

Year 1 of a 2 Year Project

May 29, 2018

Prepared by Jeffie McNeil,

Species at Risk Biologist

Mersey Tobeatic Research Institute

INTRODUCTION

The Nova Scotia population of Blanding's turtles is listed as Endangered under both the Federal Species at Risk Act (2006) and the Nova Scotia Endangered Species Act (2000) due to its small population size, isolation from the species' main range and apparent decline in abundance. Until recently, it was only known to occur in three main populations in Nova Scotia, as well as a couple of small concentrations of less than 5 turtles (Parks Canada 2012). In fall 2015, the Mersey Tobeatic Research Institute received a credible sighting report from a local fisherman of several individual turtles in a new area on the lower Medway watershed. Volunteers and researchers were able to confirm the presence of Blanding's turtles in the area in spring 2016. During the initial year of study, an unprecedented 45 adult turtles were captured, suggesting this population is a significant component of the overall Nova Scotia population complex.

The new population occurs on a mixture of private woodlots and provincial crown lands. Forestry activities on crown land have been suspended pending a better understanding of the distribution, demography and habitat use of this population. While radio-tracking during the first year of study revealed some seasonal habitats, many knowledge gaps remain. We do not yet know the full extent of this population, how many landowners may be involved, how many turtles the population supports and what seasonal habitats they are using. We know little about the population age-structure as no juvenile turtles were found during the initial year of surveying. Observations from the first year revealed some atypical seasonal travel patterns highlighting the importance of obtaining site-specific information.

This report focuses on the first year of a two-year study to characterize the population. We adopted a three-pronged approach to filling knowledge gaps: 1) radio track select individuals throughout the active season; 2) outfit turtles with GPS loggers to identify nest sites and travel routes; and 3) conduct a combination of live-trapping and visual surveys in and around the identified area to determine extent of distribution and to estimate abundance. In the second year of this project, we will conduct analysis to determine the genetic structure of the population.

Research conducted in this project is designed to directly support stewardship by filling knowledge gaps. We will use this research to inform recommendations for management practices with provincial crown land managers, industry and landowners.

METHODS

All work followed protocols developed by the Blanding's Turtle Recovery Team. Permits were obtained from the Nova Scotia Department of Natural Resources. Researchers and volunteers were trained on all survey, handling and data collection procedures.

Trapping and visual surveys

Turtle trapping involved baited hoop traps that are specifically designed to catch turtles. These traps are designed so that the mouth is sloped to allow entry but no exit. Traps were set so that the mouth was submerged but the rear was well above water, to allow the turtles to breathe (Figure 1). Traps were tied securely to a wooden stake or tree and tested to ensure that they would not submerge under the weight of a large turtle. Bait was placed inside the trap in a plastic container with small holes in the top. Each trap was baited with 1/3 of a can of sardines in soy oil.



Figure 1. Turtle baited hoop trap

Traps were set in 4-night sessions and checked once per day.

Visual surveys involved researchers slowly covering the area by canoe or on foot, looking for turtles. Active season surveys were concentrated on vegetated aquatic areas and on shores within 10m of the water's edge. An attempt was made to capture all Blanding's turtles that were seen.

Turtle handling

All Blanding's turtles encountered were marked individually by filing a small notch on specific marginal scutes of the carapace (Figure 2). Researchers were provided with a list of available notch codes, ensuring that all codes in the province are unique. At first capture, researchers measured, weighed and photographed each turtle and documented any deformities. Turtles were released at the location of capture.

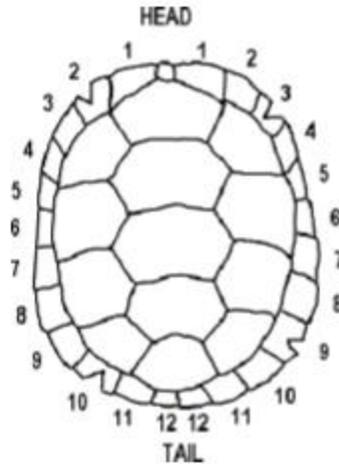


Figure 2. The notching scheme used for Blanding's turtles in Nova Scotia. Each turtle is given a unique code by notching the marginal scutes of its carapace. Notches are counted from the head, starting on the left side. Codes are written with commas separating numbers on the same side and a dash separating sides. In the above example, the code would be 2,10-3,9.

Radio tracking and GPS loggers

Select individuals were outfitted with transmitters from Holohil Systems Ltd (AI-2F, RI-2B or PD-2). The larger transmitters (AI-2F and RI-2B) have a battery life of approximately 24 months and are expected to last the duration of the two-year project, helping researchers locate spring basking, nesting, overwintering and summering sites. Smaller transmitters have 6mth battery life, sufficient for a single season. Turtles were radio-tracked periodically throughout the active season to document movement patterns and habitat use.

In addition to a transmitter, a subset of turtles received a GPS logger (Advanced Telemetry Systems) to more precisely track their movements. GPS loggers were set to record a location every 4 hours. The logger attempted to record three fixes during each interval, which were averaged in the data to create the point.

Radio transmitters and GPS loggers were glued to the hind quarter of the turtle's carapace using epoxy and were oriented such that the antenna extends to the rear. Care was taken to ensure that there were no gaps around the transmitter that might impede turtle movement as a result of snagging. Combined weight of GPS logger and transmitters did not exceed 5% of the turtle's body weight.

Data recording and management

All data was recorded on standardized data cards developed by the Blanding's turtle recovery team. For each survey, information was recorded on search effort, weather conditions, locations, trap placement, general habitat characteristics and number of each reptile species found. For each sighting, information was recorded on location, capture methodology, behaviour and morphology. Data was entered in the Nova Scotia Blanding's turtle databases.

Data was entered in the Nova Scotia Blanding's Turtle Database and proofed. Data was shared with recovery partners including the Blanding's Turtle Recovery Team and the Atlantic Canada Conservation Data Centre.

RESULTS

Trapping and surveys

Researchers conducted 515 trap nights in and around the known population (Figure 1). They put in a combined 419 person hours of onsite effort: 155 hours of trapping, 144 hours of visual surveys and 120 hours of radio tracking in 2017. This resulted in 215 observations of 45 individual Blanding's turtles (Table 1). Thirteen of the turtles were new captures, bringing the total marked in the population to 58 turtles. Two of new turtles were juveniles, the first found in the population.

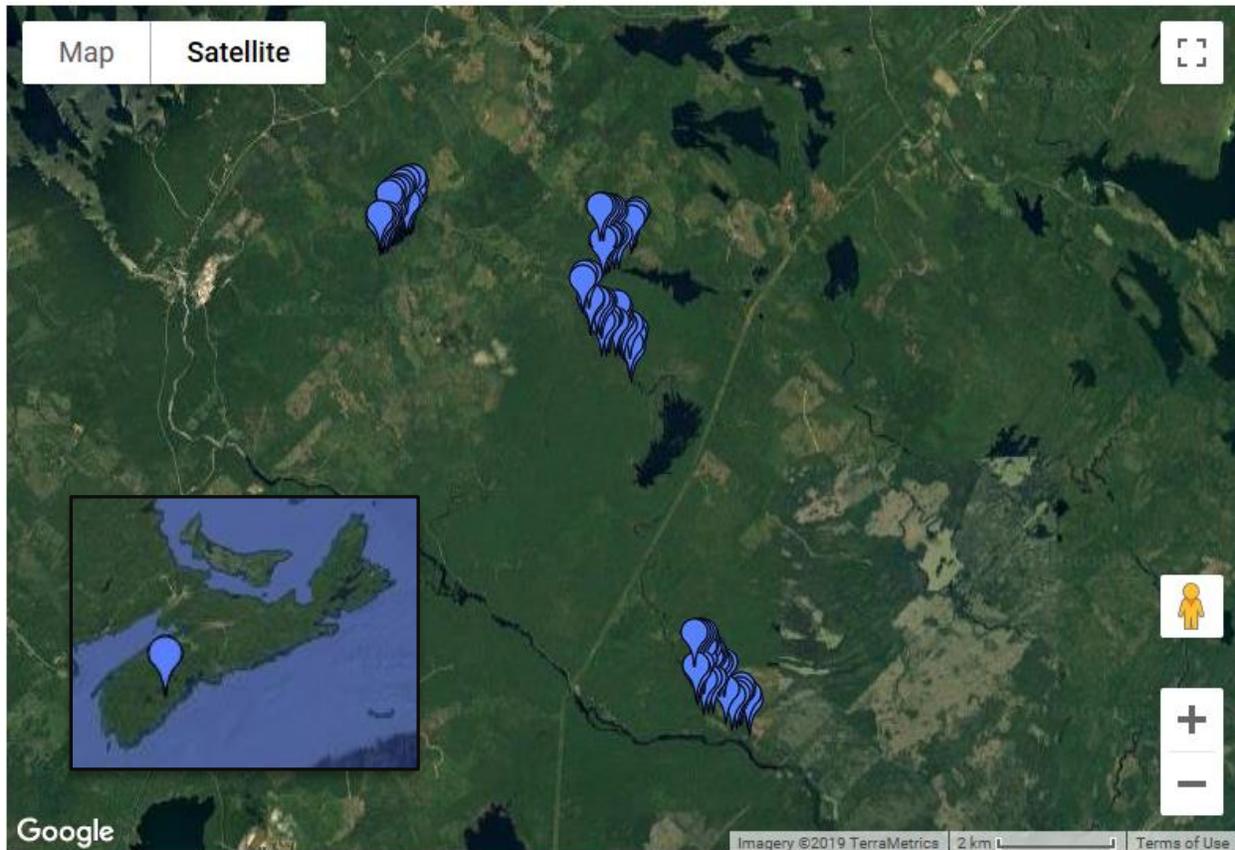


Figure 1. Trap locations in and around the Bangs Fall populations in 2017.

Table 1. Blanding's turtles encountered in Bangs Falls in 2017

| Turtle ID | Age Class | Sex | Area | Tracked? | # Observations | New Capture? |
|--------------|-----------|--------|-----------|----------|----------------|--------------|
| 0-2,3 | Adult | Female | Wentworth | No | 3 | No |
| 0-2,8 | Adult | Male | Deans | No | 1 | No |
| 0-3,9 | Adult | Male | Wentworth | No | 6 | No |
| 1,11-8,12 | Adult | Male | Deans | No | 6 | No |
| 1,2-1,3 | Adult | Female | Deans | No | 1 | No |
| 1,2-1,8A | Adult | Female | Wentworth | Yes | 17 | No |
| 1,2-10 | Adult | Male | Deans | No | 1 | No |
| 1,2-2,10 | Adult | Male | Deans | No | 3 | No |
| 1,2-2,8 | Adult | Male | Deans | No | 5 | No |
| 1,2-2,9 | Adult | Female | Deans | No | 1 | No |
| 1,2-3,8 | Adult | Female | Wentworth | No | 1 | No |
| 1,2-3,9 | Adult | Male | Wentworth | No | 1 | No |
| 1,2-8,11 | Adult | Female | Wentworth | No | 2 | No |
| 1,2-8,9 | Adult | Male | Wentworth | Yes | 3 | No |
| 1,2-9 | Adult | Female | Wentworth | Yes | 20 | No |
| 1,3-1 | Adult | Female | Deans | Yes | 10 | No |
| 1,3-3,10 | Adult | Female | Deans | No | 3 | No |
| 1,3-3,9 | Adult | Female | Deans | No | 6 | No |
| 10,11-2,9 | Adult | Male | Wentworth | Yes | 6 | No |
| 1-1,10 | Adult | Male | Wentworth | No | 4 | Yes |
| 1-1,2 | Adult | Male | Wentworth | No | 2 | Yes |
| 1-1,3 | Adult | Female | Wentworth | No | 2 | Yes |
| 1-1,8 | Adult | Male | Wentworth | No | 1 | Yes |
| 1-2,3 | Adult | Male | Wentworth | No | 1 | Yes |
| 1-3,8 | Adult | Female | Wentworth | No | 1 | Yes |
| 1-3,9 | Adult | Male | Wentworth | No | 1 | Yes |
| 1-8,10 | Juvenile | | Wentworth | No | 1 | Yes |
| 2,2-10 | Adult | Male | Deans | Yes | 2 | No |
| 2,2-11 | Adult | Female | Wentworth | Yes | 21 | No |
| 2,2-8 | Adult | Female | Deans | No | 3 | No |
| 2,8-2,3 | Adult | Male | Wentworth | No | 6 | No |
| 2-1,3 | Adult | Male | Wentworth | No | 2 | No |
| 2-3,10 | Adult | Female | Deans | Yes | 14 | Yes |
| 2-3,11 | Adult | Male | Wentworth | No | 1 | Yes |
| 2-9,10 | Adult | Male | Deans | No | 1 | No |
| 3,10-2,4 | Adult | Female | Wentworth | Yes | 21 | No |
| 3,10-9 | Adult | Male | Deans | No | 5 | No |
| 3,10-9,10 | Adult | Female | Wentworth | No | 5 | No |
| 3,8-2,11 | Adult | Female | Deans | No | 1 | No |
| 8,9-2,10 | Juvenile | | Wentworth | No | 1 | Yes |
| 8,9-3,10 | Adult | Male | Wentworth | No | 1 | Yes |
| 8,9-3,9 | Adult | Female | Wentworth | No | 1 | Yes |
| 9,9-11 | Adult | Female | Wentworth | No | 3 | No |
| 9,9-2 | Adult | Female | Wentworth | No | 2 | No |
| 9,9-8 | Adult | Female | Wentworth | Yes | 11 | No |
| Unidentified | Adult | | | | 3 | |

Radio tracking and GPS Loggers

Nine turtles were tracked over the course of the summer (Table 1), yielding information on nesting and overwintering sites. The known females at Dean’s Brook move to nearby logging roads to nest. We were unable to identify nesting sites at Wentworth Brook, however, two of the gravid females moved into the woods between Wentworth and Dean’s brooks before their signals disappeared, suggesting they traveled a considerable distance to nesting sites.



Figure 2. Radio tracking locations of female 3,10-2,4 in 2017. Points farthest south were recorded while she was gravid and are likely the beginning of her nesting journey.

Four turtles were outfitted with GPS loggers (Table 2). Unfortunately, due to technical issues, only two of the loggers yielded data points. The first logger retrieved on July 26 did not contain any data, likely due to an improper set up. Tracks were obtained from two loggers deployed on adult males from August 21 to September 13 (Figures 3 and 4). The two loggers were deployed again later in fall (October 11 and 31) but both fell off the turtles. One was retrieved the following spring but was no longer functioning.

Table 2. GPS loggers deployed on Blanding’s turtles in Bangs Falls in 2017

| Turtle ID | Date On | Date Off | Tracks? |
|-----------|---------|----------|--|
| 2,2-11F | June 29 | July 26 | No – unit was not properly activated |
| 2,8-2,3M | Aug 21 | Sept 13 | Yes |
| | Oct 31 | ? | No – found it had fallen off on Nov 27 |
| 1,2-8,9M | Aug 21 | Sept 13 | Yes |
| 3,10-2,4 | Oct 11 | ? | No – found it had fallen off Oct 31 |



Figure 3. GPS logger points from adult male 1,2-8,9 from August 21 to September 13, 2017. Locations were recorded every 4 hours when a signal could be obtained. Three GPS fixes were recorded and averaged for each location.



Figure 4. GPS logger points from adult male 2,8-2,3 from August 21 to September 13, 2017. Locations were recorded every 4 hours when a signal could be obtained. Three GPS fixes were recorded and averaged for each location.

Landowner contact

We worked with the Nova Scotia Department of Natural Resources Regional Biologist in Bridgewater to determine the most appropriate means of communicating with landowners in this remote area. The original intent was to develop a joint letter and information pamphlet from MTRI and NSDNR to inform landowners about the presence of the species. These documents were drafted but ultimately not sent. Over the course of the discussions we realized that the two organizations had different purposes and a joint approach might not be the most well received by the landowners. MTRI's goal was primarily in obtaining permission to conduct research on their land and in informing the landowners about these species, while the NSDNR was interested in formal contact which might serve a more legal purpose. An added factor was that Environment and Climate Change Canada (ECCC) will also eventually send letters to landowners as part of the consultation for the Blanding's Turtle Action Plan when it is posted. Ultimately, we decided to abandon the joint approach and agreed that MTRI would pursue an original "soft" contact through one-on-one meetings when local landowners could be identified and would send letters only in cases where the landowner was not available in the local area. NSDNR and ECCC may follow up later with official letters, as necessary. As MTRI didn't have access to an updated landownership layer, we were only able to identify a sub-set of the landowners in year 1 of this project.

After provincial crown land, the largest landowner in the area is a local lumber company, Freeman Lumber. The company and family members own 5 parcels within the population, encompassing approximately 1000 ha. MTRI researchers were in been in regular contact with the company over the summer of 2017, with Freeman's allowing researchers to use their roads to access the sites. In spring 2018 we presented our findings to 9 staff and owners at Freeman Lumber and discussed ways to mitigate risks to turtles in the area. Based on the information we presented, Freeman's agreed to install a gate on one of their logging roads where Blanding's turtles nest. The gate will be closed from nesting season until the end of emergence to reduce logging and ATV traffic.

EXPENSES

| Category | Item | Budget | Actual |
|--------------------|------------------------------|--------------|-----------------|
| Wages and Salaries | Project Coordinator | 1800 | 1791.13 |
| Wages and Salaries | Field researchers | 1290 | 3178.62 |
| Travel | Vehicle Rental and insurance | 1600 | 1288.34 |
| Travel | Accommodations | 600 | 800.00 |
| Travel | Gas/ mileage | 400 | 808.30 |
| Supplies | GPS loggers | 4000 | 2296.97 |
| Supplies | Transmitters | 450 | 0 |
| Supplies | Field supplies | 100 | 78.58 |
| Total | | 10240 | 10241.94 |

Wage and travel expenses were higher than originally budgeted due to delays in obtaining matching funds for this project. Permission to re-allocate funds was obtained via email August 18, 2017.

LITERATURE CITED

- Lefebvre, J., T. S. Avery, and T.B. Herman. 2011. Size dimorphism and growth rates in distinct populations of Blanding's turtles (*Emydoidea blandingii*) in Nova Scotia in relation to environment. *Herpetological Conservation and Biology* 6(3):465:472.
- McNeil, J.M. 2016. Developing a monitoring plan for Blanding's turtles in Nova Scotia, using McGowan Lake as a case study. Unpublished document, October 2016. 14 pp.
- McNeil, J.M. 2002. Distribution, movements, morphology and reproduction in a population of Blanding's turtle (*Emydoidea blandingii*) in an unprotected landscape in southwest Nova Scotia. MSc thesis. Acadia University, Wolfville, NS.
- Mockford, S., L. McEachron, T. Herman, M.Snyder and J. Wright. 2005. Population genetic structure of a distinct population of Blanding's turtle (*Emydoidea blandingii*) in Nova Scotia, Canada. *Biological Conservation* 123: 373-380.
- Parks Canada. 2017. Recovery Strategy for the Blanding's turtle (*Emydoidea blandingii*), Nova Scotia population, in Canada. Species at Risk Act Recovery Strategy Series. Parks Canada, Ottawa. vii + 34 pp.
- NS Eastern Ribbonsnake Database. 2017. Maintained by the Eastern Ribbonsnake Recovery Team. *Accessed: November 7, 2017.*