

The Friends of Nachusa Grasslands 2017 Scientific Research Project Grant Report

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2017 grant amount: \$5,000

Research Project Topic:

This project addresses Blanding's Turtle conservation and management. Blanding's Turtles are a state endangered species, occurring in wetland and adjacent upland habitats in the northern third of Illinois.

Research Project Purpose:

The objectives of this project are to develop on-the-ground management strategies to promote the persistence Blanding's Turtles within the Franklin Creek corridor and north-central Illinois more generally. Radiotelemetry is used to track adult turtles and locate and protect nests from predators. Hatchlings are released within wetlands to minimize mortality immediately following hatching.

Research Project Outcomes to date:

We have now captured 11 unique individual Blanding's Turtles at Nachusa Grasslands. Importantly, two juveniles were captured in 2017, suggesting that restoration efforts (removal of encroaching wood vegetation, conversion of agricultural land to prairie) has had positive effects on recruitment (a more extensive report on the results of this project is attached).

Describe how the grant funds you have received from the Friends of Nachusa Grasslands have been used in regard to the above topic, purpose, and/or outcomes:

| | |
|--|-----------|
| Radiotransmitters, 5 @ \$175 + shipping | \$ 905.00 |
| D. Mauger – 10 days of trapping | \$2500.00 |
| A. Etheridge – field technician, 125 hr @ \$10/hr | \$1250.00 |
| R. King – partial mileage reimbursement for travel between NIU and Nachusa Grasslands | \$ 345.00 |

Describe how your project has benefited the work and goals of Nachusa Grasslands:

- Identification of wetland and upland habitat used by Blanding's Turtles
- Identification and characterization of nest sites
- Determination of the timing of key life-history events (active season, nesting, hatching)

Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern:

This project has identified areas where encroachment by woody vegetation may reduce habitat quality for Blanding's Turtles, areas where care should be exercised in the application of management practices to avoid negative impacts on Blanding's Turtles, and areas adjacent to Nachusa Grasslands that may be utilized by Blanding's Turtles.

Please list presentations/posters you have given on your research:

- A summary of "Snake and Turtle Responses to Restoration at Nachusa Grasslands" was presented at the Nachusa Grasslands Science Symposium on 21 October 2017.
- A write-up appeared in *Prairie Smoke* and on-line at the TNC website.

Have you submitted manuscripts to scientific journals? If so, which ones? If not, do you anticipate doing so?

No but as additional data accumulate, publication is a possibility.

BLANDING'S TURTLES, TIGER SALAMANDERS, AND PRAIRIE RESTORATION AT NACHUSA GRASSLANDS

A Report to The Nature Conservancy

28 December 2017

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To assess the success of restoration and management, a variety of animal taxa are being monitored at The Nature Conservancy's Nachusa Grasslands (Lee and Ogle Co., IL). This report summarizes monitoring efforts focused on Blanding's Turtles (Section I) and Tiger Salamanders (Section II) by R. King and colleagues during 2017. Dates of visits to Nachusa Grasslands, participants, and primary activities are provided in an appendix. A summary of "Snake and Turtle Responses to Restoration at Nachusa Grasslands" was presented at the Nachusa Grasslands Science Symposium on 21 October 2017.

I. Abundance, movements, and habitat use by Blanding's Turtles at Nachusa Grasslands

Background. – The Blanding's Turtle is an Illinois state endangered species with a distribution limited to the northern third of the state (King 2013). It's conservation and management is made challenging by a long lifespan (sexual maturity is not reached until 15-17 years of age) and use of large expanses of both wetland and upland habitat (Congdon et al. 1993, 2008). Prior to 2014, records of Blanding's Turtles at Nachusa Grasslands were sparse with just seven element occurrences between 1990 and 2008 (Illinois Natural Heritage Database). To better characterize the status of Blanding's Turtles at Nachusa Grasslands, T. Anton and D. Mauger initiated annual monitoring efforts in 2014 consisting of 6-10 days of trapping each year. Efforts expanded in 2016 with participation by R. King and the addition of radiotelemetry, nest protection, and hatchling monitoring (Anton and Mauger 2014, Mauger and Anton 2015, 2016, 2017; King 2016).

Methods. – Details of trapping efforts are provided separately in reports by Anton and Mauger (Anton and Mauger 2014, Mauger and Anton 2015, 2016, 2017). When captured, Blanding's Turtles were individually marked by notching the margins of the carapace (upper shell), measured, weighed, and classified by sex. In addition, a subset of animals were outfitted with radio transmitters. Transmitters (ATS R2030, 24 g) were affixed to the carapace of turtles using epoxy adhesive (Fig. 1) and turtles were located using a handheld receiver and antenna.

Abundance. – Since 2014, a total of 11 juvenile and adult Blanding's Turtles (6 females, 3 males, 2 juveniles) have been documented at Nachusa Grasslands (Table 1). Captures have occurred in two areas, Biven's Pond, a wetland spanning TNC and privately-owned property near Naylor Road, and Tellabs Savanna, a wetland complex at the west end of TNC property adjacent to Franklin Creek (Fig. 4). Only a single female is known from the Biven's Pond area; five females, three males, and two juveniles have been captured at Tellabs Savanna (Table 1).

Movements. – Radio telemetry of eight adult Blanding's Turtles (six in 2016 and 2017; two in 2017 only) demonstrated their use wetland and upland habitats associated with the Franklin Creek corridor on both TNC and adjacent property (Fig. 2-9). Home ranges, calculated using the maximum convex polygon method, ranged from 2.5 to 39 ha. Of seven turtles initially captured at Tellabs Savanna, only one, female 1L8R, restricted its movements to TNC property (Fig. 4). The other six moved off-property using the Franklin Creek corridor and associated wetlands south and west of the TNC property boundary (Fig. 3, 5, 6, 7, 8, 9). Similarly, the single female known from the Biven's Pond area utilized both TNC and adjacent off-property habitat (Fig. 2).

Table 1. Captures (C), telemetry (T), and size of eleven juvenile and adult Blanding's Turtles at Nachusa Grasslands. Mass and carapace lengths were obtained upon first capture.

| ID | Sex | Mass (g) | Carapace Length (mm) | 2014 | 2015 | 2016 | 2017 |
|-------|----------|----------|----------------------|------|------|------|------|
| 1L1R | Female | 1200 | 200.0 | C | C | T | T |
| 1L2R | Female | 1185 | 205.5 | | C | T | T |
| 1L3R | Female | 1230 | 199.0 | | C | C | |
| 1R8R | Female | 1030 | 189.0 | | C | T | T |
| 1R9R | Male | 1600 | 223.0 | | C | T | T |
| 1L8R | Female | 1070 | 183.0 | | C | T | T |
| 1L9R | Female | 983 | 185.5 | | | T | T |
| 1L10R | Male | 1430 | 224.5 | | | C | T |
| 1L11R | Male | 1420 | 222.0 | | | C | T |
| 1L12R | Juvenile | 154 | 101.0 | | | | C |
| 2L1R | Juvenile | 114 | 88.5 | | | | C |

Wetland habitats utilized by Blanding's Turtles included sedge and cattail dominated areas (Biven's Pond), sedge and buttonbush-dominated areas (Tellabs Savanna), an excavated pond (Tellabs Savanna), wooded oxbow ponds associated with Franklin Creek (south and west of TNC property lines at Tellabs Savanna), and pools within Franklin Creek. An extended period without rain during late summer and fall 2017 resulted in drying down of wetlands within Tellabs Savanna. By mid-September, only the excavated pond at the northwest corner of the property and a small centrally located spring-fed pool (the "Drinking Spring") retained water within the TNC-owned portions of Tellabs Savanna. During this period, Blanding's Turtles utilized pools in Franklin Creek, more permanent wooded oxbow ponds associated with Franklin Creek (south and west of TNC property lines at Tellabs Savanna), or spent extended periods on land in shaded upland areas.

Based on the location of turtles in February 2017 (corresponding to winter 2016/2017) and December 2017 (corresponding to winter 2017/2018), Blanding's Turtles overwintered in deeper water at Biven's Pond, the excavated pond at the northwest corner of Tellabs Savanna, or oxbow ponds associated with Franklin Creek (south and west of TNC property lines at Tellabs Savanna) (Fig. 2-9).

Reproduction. – Palpation in late May and early June indicated that all five telemetered females contained eggs in 2016 and four of the five contained eggs in 2017 (Table 2). Nearly daily monitoring of females to detect nesting activities began ca. 1 June of each year. Females exited wetlands between 2 and 17 June 2016 and between 4 and 9 June 2017 in search of nest sites. Using radio telemetry, it was possible to witness egg laying by two females in 2016 (10 and 18 June) and three females in 2017 (9, 11, and 13 June) (Table 2, Fig. 2-5). These nests were caged using hardware cloth to prevent depredation (Fig. 10). Nest sites of other females went

undetected (Table 2). Daily monitoring of protected nests began ca. 25 August of each year. Hatchlings emerged on 30 Aug and 6 Sep 2016 and on 11 Sep and 17 Sep (2 nests) 2017 (Fig. 11). Hatchlings were measured and released in wetlands used by the females that produced them (Fig. 12).

Table 2. Reproductive behaviors of adult female Blanding’s Turtles at Nachusa Grasslands in 2016 and 2017. All females except 1L3R were equipped with radio transmitters. Eggs were detected via palpation in late May and early June.

| Female | Year | Eggs Detected? | Exit from Wetland | Egg Laying Date | Hatch Date | Outcome |
|--------|------|----------------|-------------------|-----------------|------------|--------------------------------|
| 1L1R | 2016 | Yes | 17 June | 19 June | 6 Sep | 8 hatchlings |
| 1L2R | 2016 | Yes | 3 June | - | - | - |
| 1L3R | 2016 | - | - | - | - | - |
| 1R8R | 2016 | Yes | 2 June | - | - | - |
| 1L8R | 2016 | Yes | 10 June | 10 June | 30 Aug | 3 hatchlings, 1 infertile egg |
| 1L9R | 2016 | Yes | - | - | - | - |
| 1L1R | 2017 | No | - | - | - | - |
| 1L2R | 2017 | Yes | 8 June | 13 June | 17 Sep | 9 hatchlings, 2 infertile eggs |
| 1L3R | 2017 | - | - | - | - | - |
| 1R8R | 2017 | Yes | 4 June | - | - | - |
| 1L8R | 2017 | Yes | 9 June | 11 June | 17 Sep | 6 hatchlings, 3 infertile eggs |
| 1L9R | 2017 | Yes | 7 June | 9 June | 11 Sep | 7 hatchlings |

Positive Impacts of Habitat Restoration. – Blanding’s Turtle habitat at Nachusa Grasslands, particularly the Tellabs Savanna unit, has undergone significant restoration. Large-scale removal of encroaching woody vegetation from wetland areas used by Blanding’s Turtles took place in 2003. Areas used by Blanding’s Turtles for nesting were converted from agricultural fields to prairie vegetation in winter 2010/2011. Significantly, two juvenile Blanding’s Turtles captured in 2017 were estimated to be four years old and thus would have hatched in 2013, shortly after restoration efforts were completed. These juveniles represent the first evidence of recruitment since monitoring efforts began in 2014.

Reconnaissance – Blanding’s Turtles at Nachusa Grasslands occur in low numbers and make extensive use of suitable habitat on neighboring properties. To better understand the size and habitat use of this population, reconnaissance of potential Blanding’s Turtle habitat and travel corridors has been conducted.

- Within TNC managed property at Nachusa Grasslands, wetlands occupied by Blanding’s Turtles (Biven’s Pond, Tellabs Savanna) and restored wetlands representing potential Blanding’s Turtle habitat (Right-of-Way Ponds, Water Control Structure, Jay Miner Wetlands) are connected by Franklin Creek and its tributaries (Wade Creek from Right-of-Way Ponds, an unnamed creek from Biven’s Pond; Fig. 13). Although Blanding’s Turtles have not been encountered during trapping efforts at Right-of-Way Ponds, Water Control Structure, and Jay Miner Wetlands, continued monitoring is planned.
- A constructed pond and associated wetlands on the south side of Franklin Creek (Walgreen property) appears to be suitable Blanding’s Turtle habitat. Monitoring of this area is planned for 2018.
- Telemetry of Blanding’s Turtles first encountered on TNC property has demonstrated their utilization of oxbow ponds and wetlands south and west of Tellabs Savanna (Levan and Walgreen properties, respectively). Monitoring of the Walgreen property is planned for 2018.
- Aerial imagery (Google Earth, 4/6/2017) suggests that additional oxbow ponds and wetlands along Franklin Creek between Lost Nation Road and the Rock River may provide suitable Blanding’s Turtle habitat. Physical reconnaissance of this portion of the Franklin Creek corridor is recommended.
- Possible Blanding’s Turtle habitat exists within Franklin Creek State Natural Area, upstream from Nachusa Grasslands. Oxbow ponds adjacent to Franklin Creek east of the Franklin Creek Grist Mill and south of Old Mill Road and pools within Franklin Creek may be used by Blanding’s Turtles, at least seasonally. Follow-up reconnaissance is planned for 2018.

Potential Utility of Trail Cameras for Blanding’s Turtle Monitoring. – The basking behavior of turtles makes the use of trail cameras a potential method for Blanding’s Turtle monitoring. To test feasibility, trail cameras were positioned near a known basking log in Biven’s Pond and adjacent to a wooden pallet fastened to posts in the shallows of an excavated pond at Tellabs Savanna (Fig. 14). Although no Blanding’s Turtles were observed, Painted Turtles made frequent use of basking structures, allowing fine-tuning of camera placement and programming. More extensive deployment of trail cameras to monitor for Blanding’s Turtles is planned for 2018.

Future Research and Management. – Batteries powering radio transmitters affixed to adult Blanding’s Turtles are expected to function through spring 2018 and additional transmitters may be deployed in 2018. This will provide further data on nest site selection, allow nests to be protected, and ensure that additional hatchlings successfully find their way to maternal wetlands. Trapping and use of trail cameras is planned for TNC-owned wetlands and wetlands on the adjacent Walgreen property. Further reconnaissance of Franklin Creek State Natural Area and possibly other properties is planned.

Management of wetlands and upland nesting habitat might focus on maintaining hydrology, preventing encroachment by woody vegetation, and maintaining sparsely vegetated areas used for nesting.

II. Occurrence of Tiger Salamanders at Nachusa Grasslands

The Tiger Salamander, *Ambystoma tigrinum*, remains the only salamander species documented at Nachusa Grasslands (Anton, Mauger, and Willink 2013). Adults spend much of the year in burrows or under logs and rocks and are encountered infrequently (Phillips et al. 1999). Breeding occurs in early spring, primarily in fish-free ponds, and larvae transform into terrestrial juveniles in late summer or autumn.

At Nachusa Grasslands, adult Tiger Salamanders have been observed in the Thelma Carpenter unit in 2009, 2013, 2015, 2016, and 2017 (Anton, Mauger, and Willink 2013; King 2016a, b; Fig. 15). Breeding occurs in a small pond within the Thelma Carpenter unit as confirmed by the presence of egg masses in both 2016 and 2017 (Table 3; Fig. 16). In 2017, some egg masses appeared inviable, presumably due to freezing temperatures following deposition. Furthermore, pond drying during 2017 may have prevented successful metamorphosis (Fig. 17).

Table 3. Counts of Tiger Salamander egg masses in pond within the Thelma Carpenter unit at Nachusa Grasslands

| Date | Number of Egg Masses |
|---------------|--|
| 22 March 2016 | ca. 40 |
| 9 March 2017 | 9 |
| 21 March 2017 | 21 (5 inviable, 16 partly or fully viable) |

As single adult Tiger Salamander was observed in the Stone Barn unit in 2016 (Fig. 18). A temporary pond adjacent to the Stone Barn unit was searched for egg masses on 9 March 2017 without success (Fig. 18). This pond lacks emergent wetland vegetation and water clarity was low due to suspended sediments. Searches for Tiger Salamander egg masses in other wetland areas at Nachusa Grasslands on 22 March 2016, 9 March 2017, and 21 March 2017 (dates when egg mass were detected at the Thelma Carpenter pond) were also unsuccessful (Fig. 19).

Management Recommendations

- Currently, Tiger Salamanders are known to breed at only a single site at Nachusa Grasslands, the pond within the Thelma Carpenter unit. Maintaining the integrity of this site is of high importance for Tiger Salamander persistence.
- Management at Nachusa Grasslands has resulted in a net increase in wetland habitat. Continued monitoring for evidence of Tiger Salamander colonization and reproduction, through spring-time surveys for egg masses, is warranted.

- Translocation of egg masses to unoccupied wetlands bears consideration but could have a negative impact on the single source site within the Thelma Carpenter unit. For the near term, continued monitoring of unoccupied wetlands to detect natural colonization may be a lower risk strategy.

Acknowledgements:

Alicen Etheridge, a student at Aurora University, and Nathaniel Weickert, a member of the Nachusa Grasslands Crew, and John Vanek, a graduate student at NIU assisted with Blanding's Turtle trapping, radiotelemetry, and nest monitoring.

Literature Cited:

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- Mauger, D., and T. G. Anton. 2015. Nachusa Grasslands Turtle Trapping Survey Summary Report 2015. Report to The Nature Conservancy. 7 pp.
- Mauger, D., and T. G. Anton. Nachusa Grasslands 2016 Turtle Trapping Survey Summary Report. Report to The Nature Conservancy. 11 pp.
- Mauger, D., and T. G. Anton. Nachusa Grasslands 2017 Turtle Trapping Survey Summary Report. Report to The Nature Conservancy. 14 pp.



Figure 1. Female Blanding's Turtle 1L1R upon release following radio transmitter attachment in May 2016.

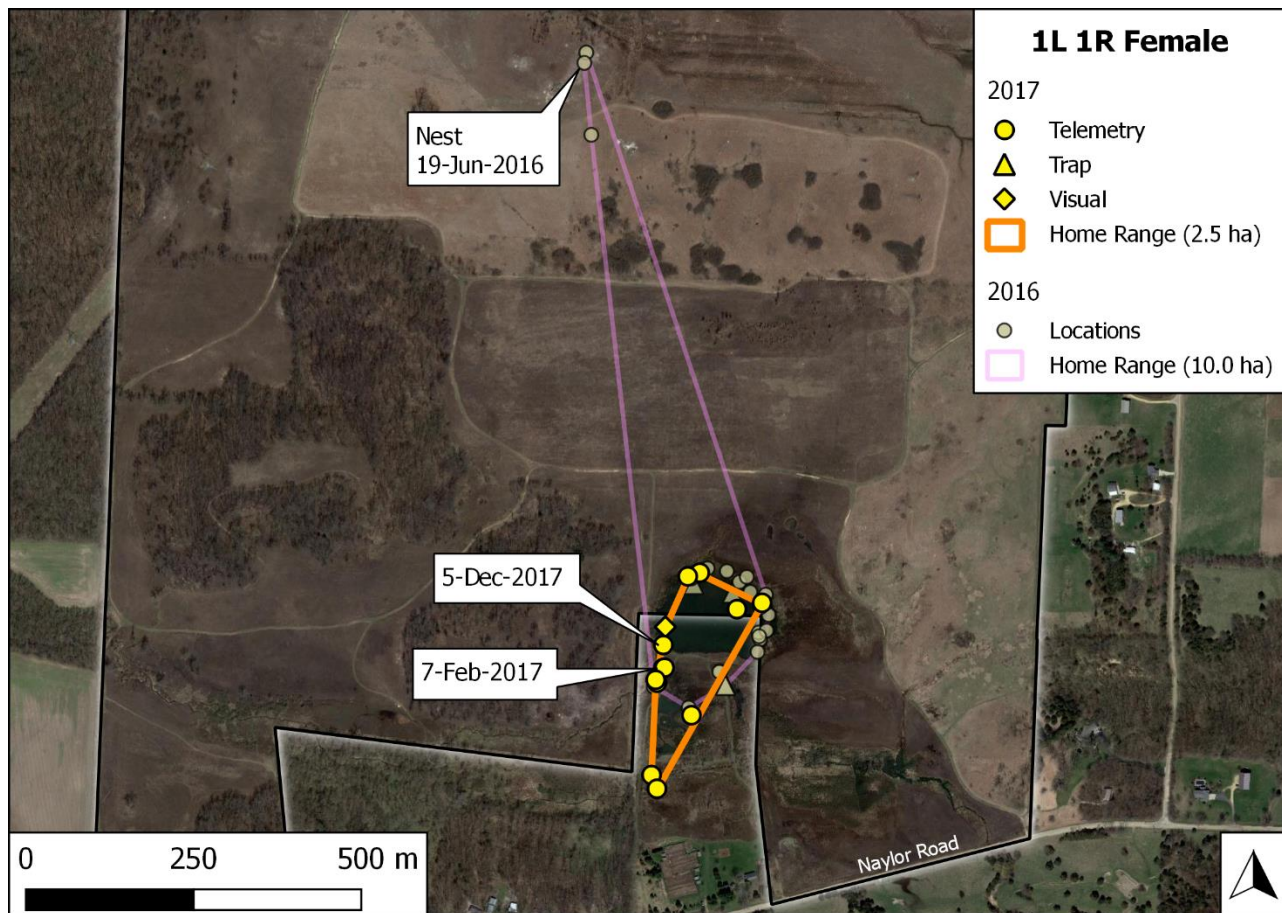


Figure 2. Radiotelemetry and trap capture locations of adult female Blanding's Turtle 1L1R from May 2016 – December 2017. Labels denote her 2016 nest site (she did not nest in 2017), her 2016/2017 overwintering location (labeled 7-Feb-2017) and her 2017/2018 overwintering location (labeled 5-Dec-2017). Her home range, calculated using the maximum convex polygon method, is outlined in lavender for 2016 and orange for 2017.

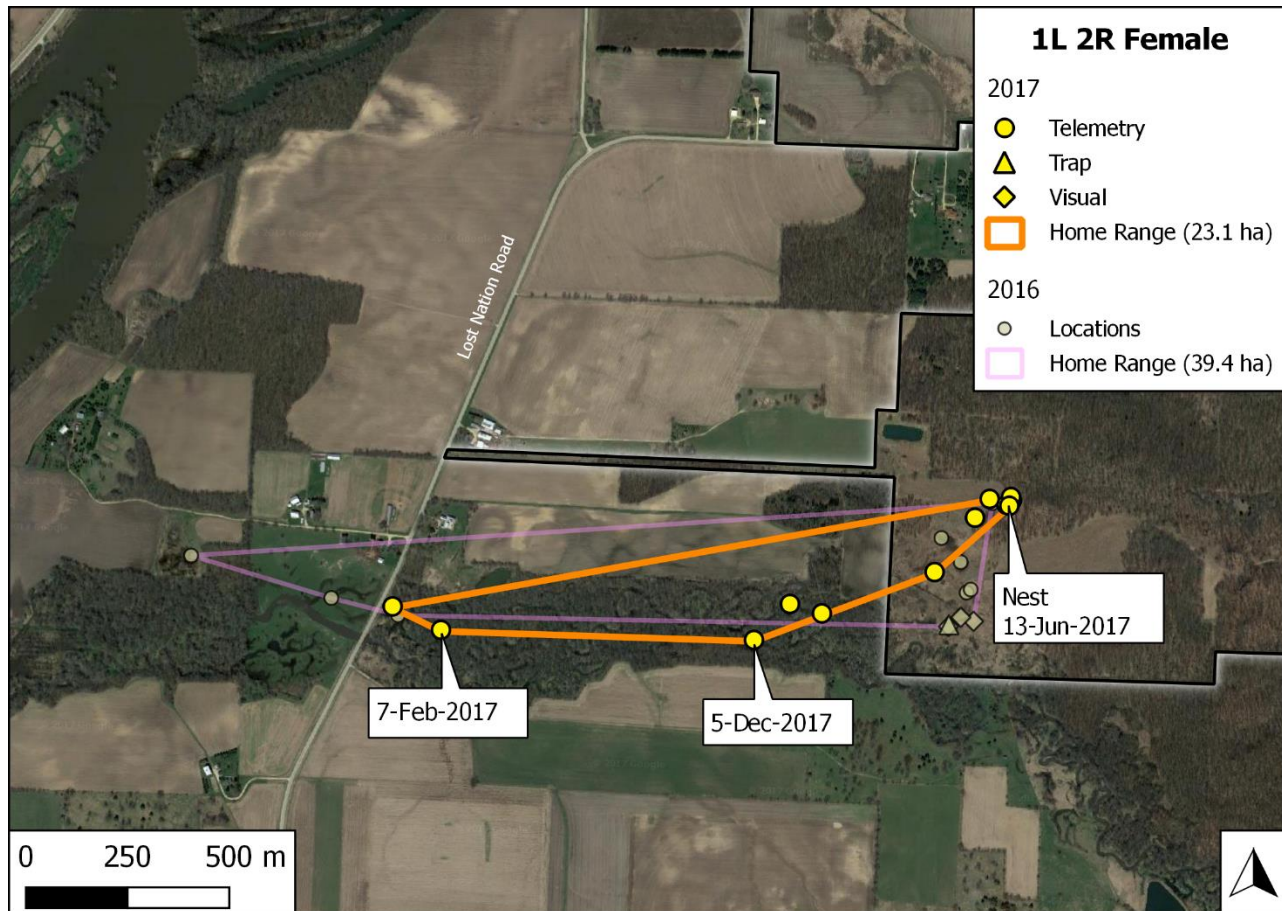


Figure 3. Radiotelemetry and trap capture locations of adult female Blanding's Turtle 1L2R from May 2016 – December 2017. Labels denote her 2017 nest site (her 2016 nest site went undetected), her 2016/2017 overwintering location (labeled 7-Feb-2017) and her 2017/2018 overwintering location (labeled 5-Dec-2017). The three 2016 points furthest to the west represent approximate locations inferred by triangulation from Lost Nation Road and Kingdom Road. Her home range, calculated using the maximum convex polygon method, is outlined in lavender for 2016 and orange for 2017.

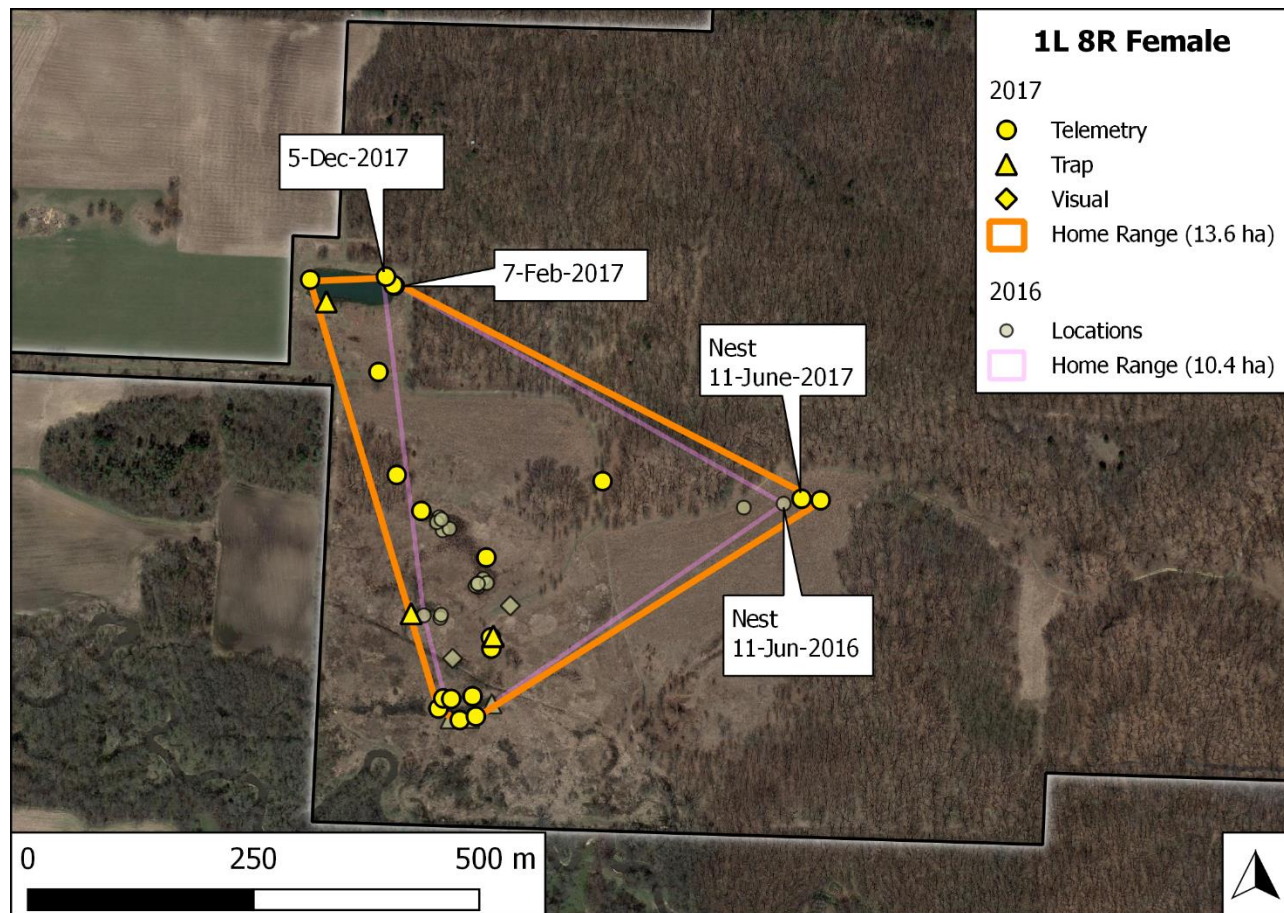


Figure 4. Radiotelemetry and trap capture locations of adult female Blanding's Turtle 1L8R from May 2016 – December 2017. Labels denote her 2016 and 2017 nest sites, her 2016/2017 overwintering location (labeled 7-Feb-2017) and her 2017/2018 overwintering location (labeled 5-Dec-2017). Her home range, calculated using the maximum convex polygon method, is outlined in lavender for 2016 and orange for 2017.

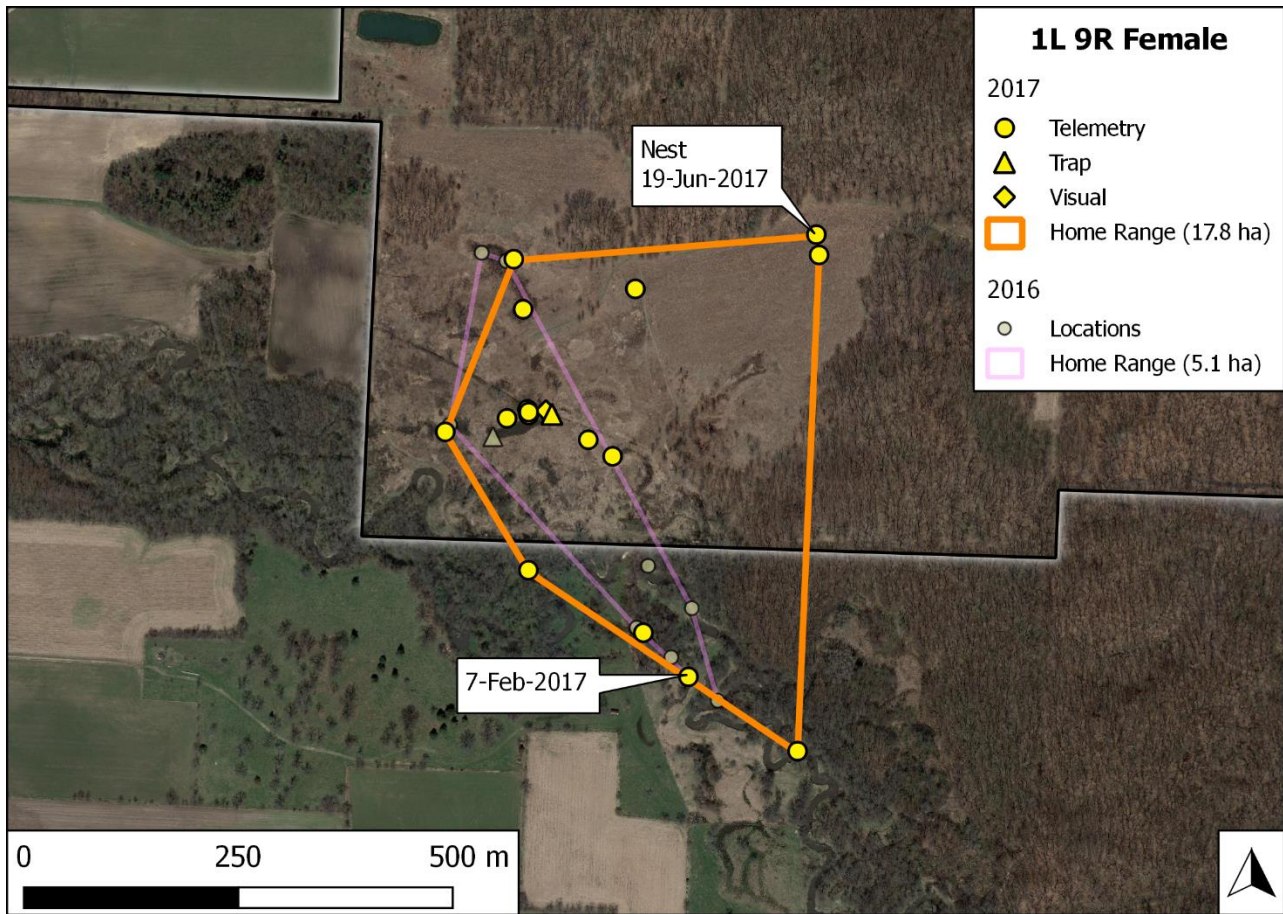


Figure 5. Radiotelemetry and trap capture locations of adult female Blanding’s Turtle 1L9R from May 2016 – December 2017. Labels denote her 2017 nest site (her 2016 nest site went undetected) and her 2016/2017 overwintering location (labeled 7-Feb-2017). Her 2017/2018 overwintering location is somewhere south of the Nachusa property line (probably near her 2016/2017 location). Her home range, calculated using the maximum convex polygon method, is outlined in lavender for 2016 and orange for 2017.

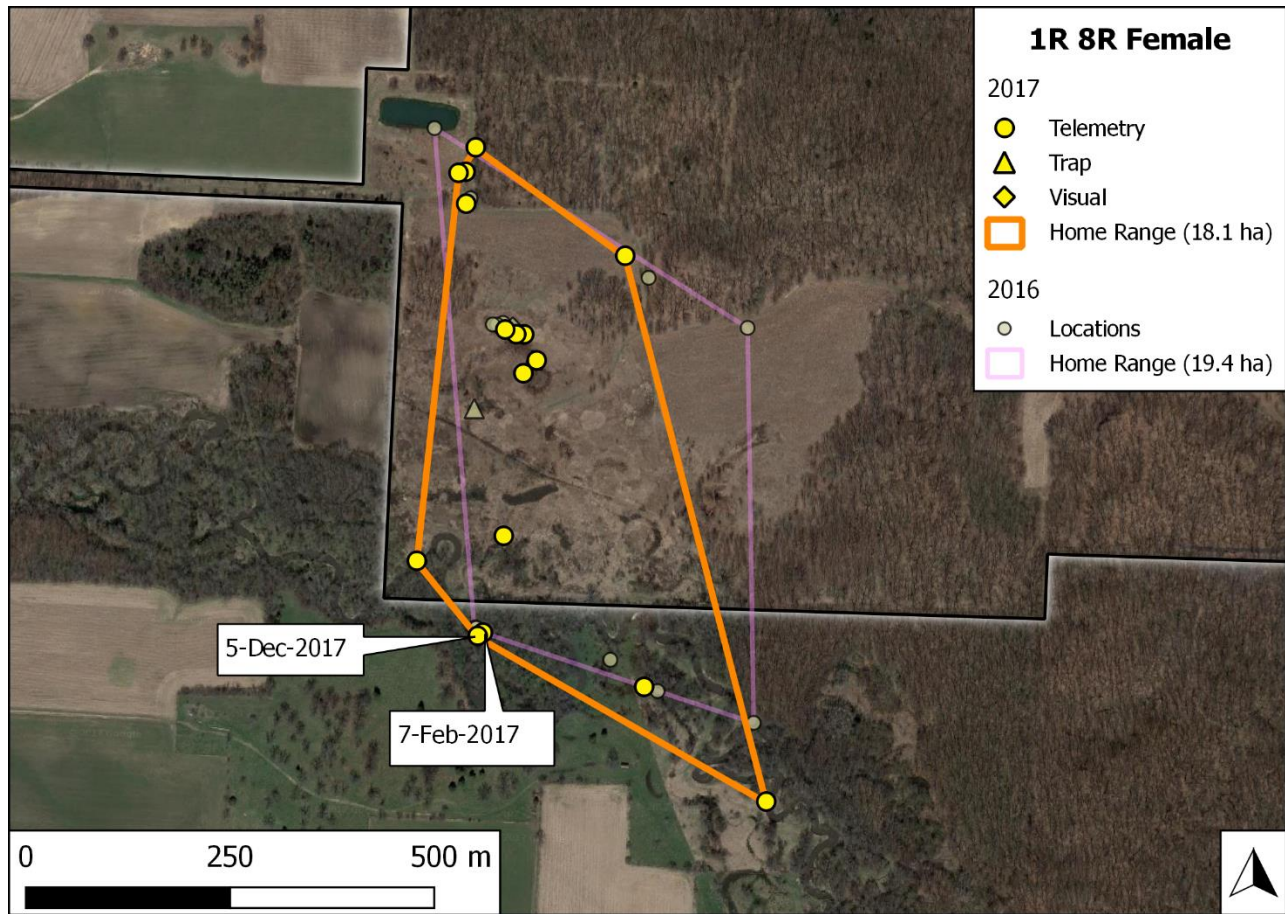


Figure 6. Radiotelemetry and trap capture locations of adult female Blanding’s Turtle 1R8R from May 2016 – December 2017. Labels denote her 2016/2017 overwintering location (labeled 7-Feb-2017) and her 2017/2018 overwintering location (labeled 5-Dec-2017). Her 2016 and 2017 nest sites went undetected. Her home range, calculated using the maximum convex polygon method, is outlined in lavender for 2016 and orange for 2017.

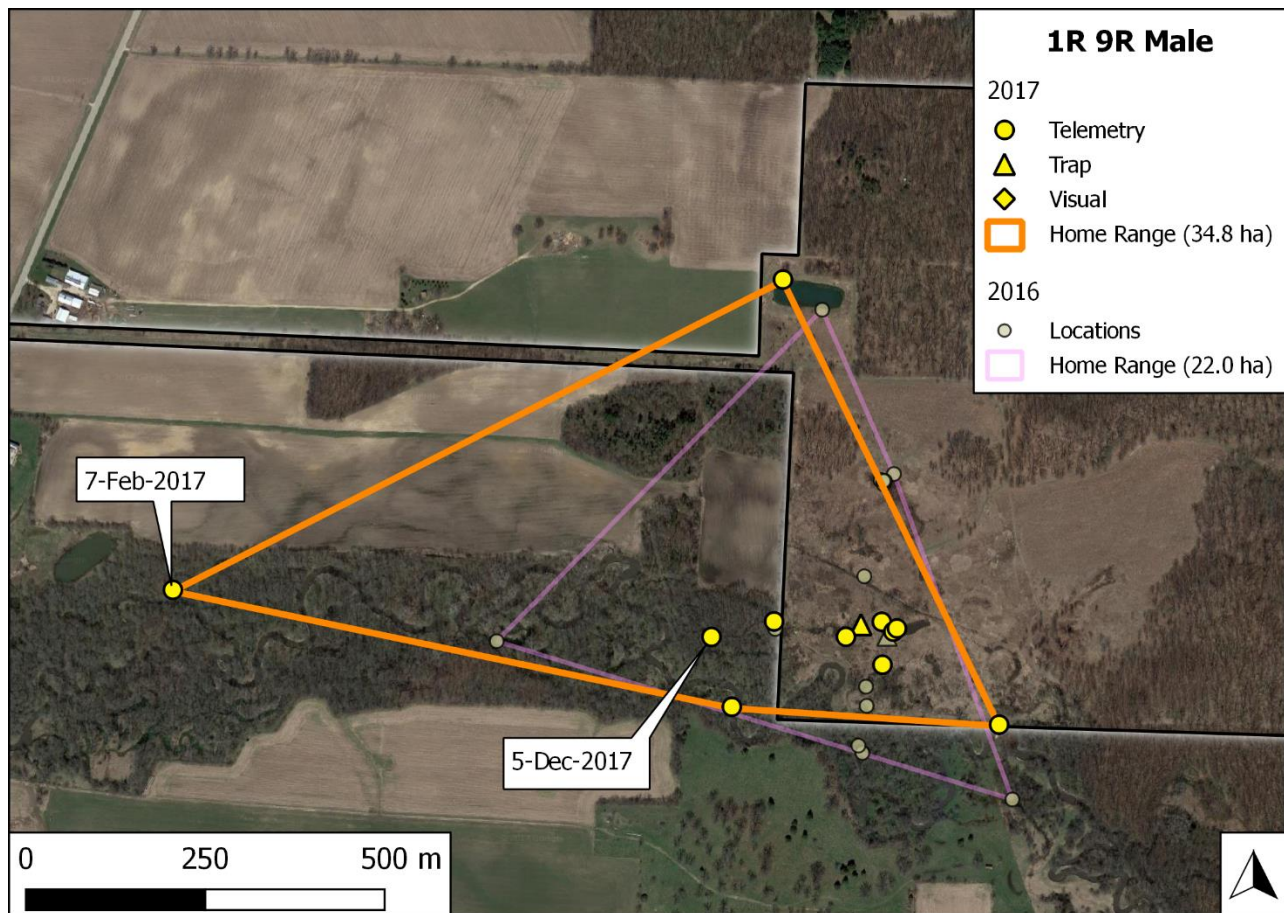


Figure 7. Radiotelemetry and trap capture locations of adult male Blanding’s Turtle 1R9R from May 2016 – December 2017. Labels denote his 2016/2017 overwintering location (labeled 7-Feb-2017) and his 2017/2018 overwintering location (labeled 5-Dec-2017). His home range, calculated using the maximum convex polygon method, is outlined in lavender for 2016 and orange for 2017.

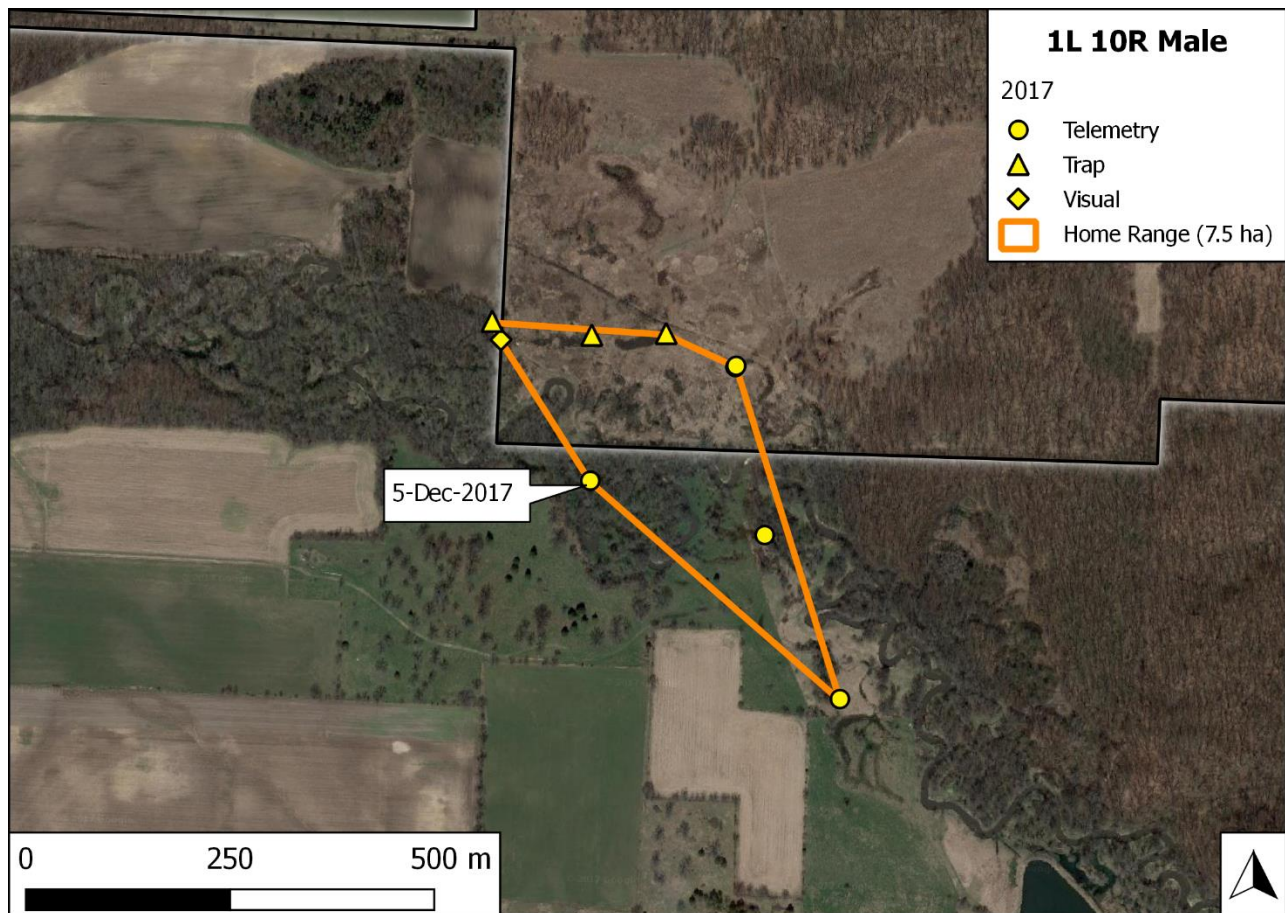


Figure 8. Radiotelemetry and trap capture locations of adult male Blanding’s Turtle 1R10R from May – December 2017. Labels denote his 2017/2018 overwintering location (labeled 5-Dec-2017). His home range, calculated using the maximum convex polygon method, is outlined in orange for 2017.

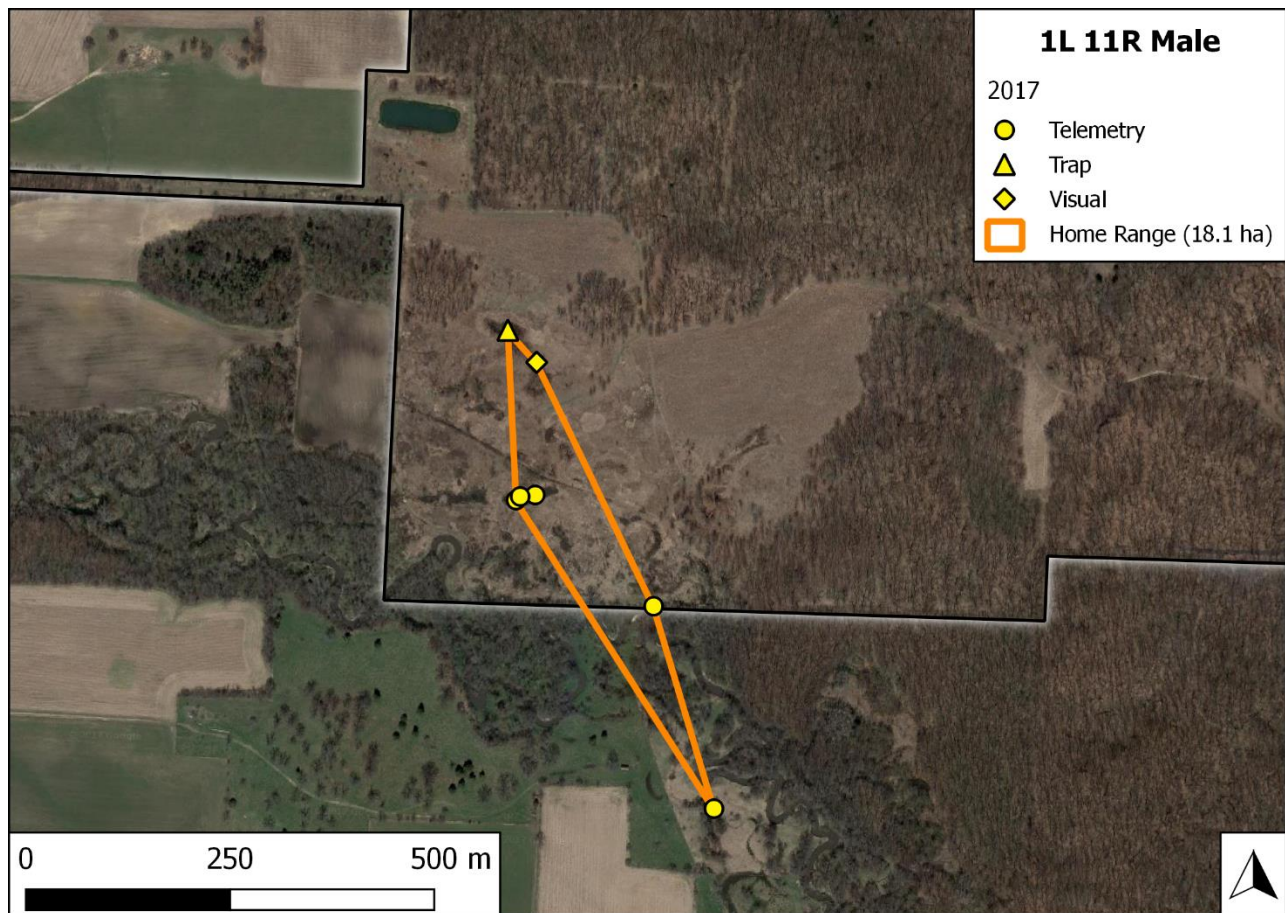


Figure 9. Radiotelemetry and trap capture locations of adult male Blanding's Turtle 1R11R from April – December 2017. His 2017/2018 overwintering location is somewhere south of the Nachusa property line. His home range, calculated using the maximum convex polygon method, is outlined in orange for 2017.



Figure 10. Hardware cloth nest protector around nest deposited by female 1L2R in June 2017.



Figure 11. Hatchling Blanding's Turtle in Sep 2017 shortly after emergence from nest laid by female 1L2R.



Figure 12. Hatchling Blanding's Turtles following their releases in September 2017 (photo by Dee Hudson).

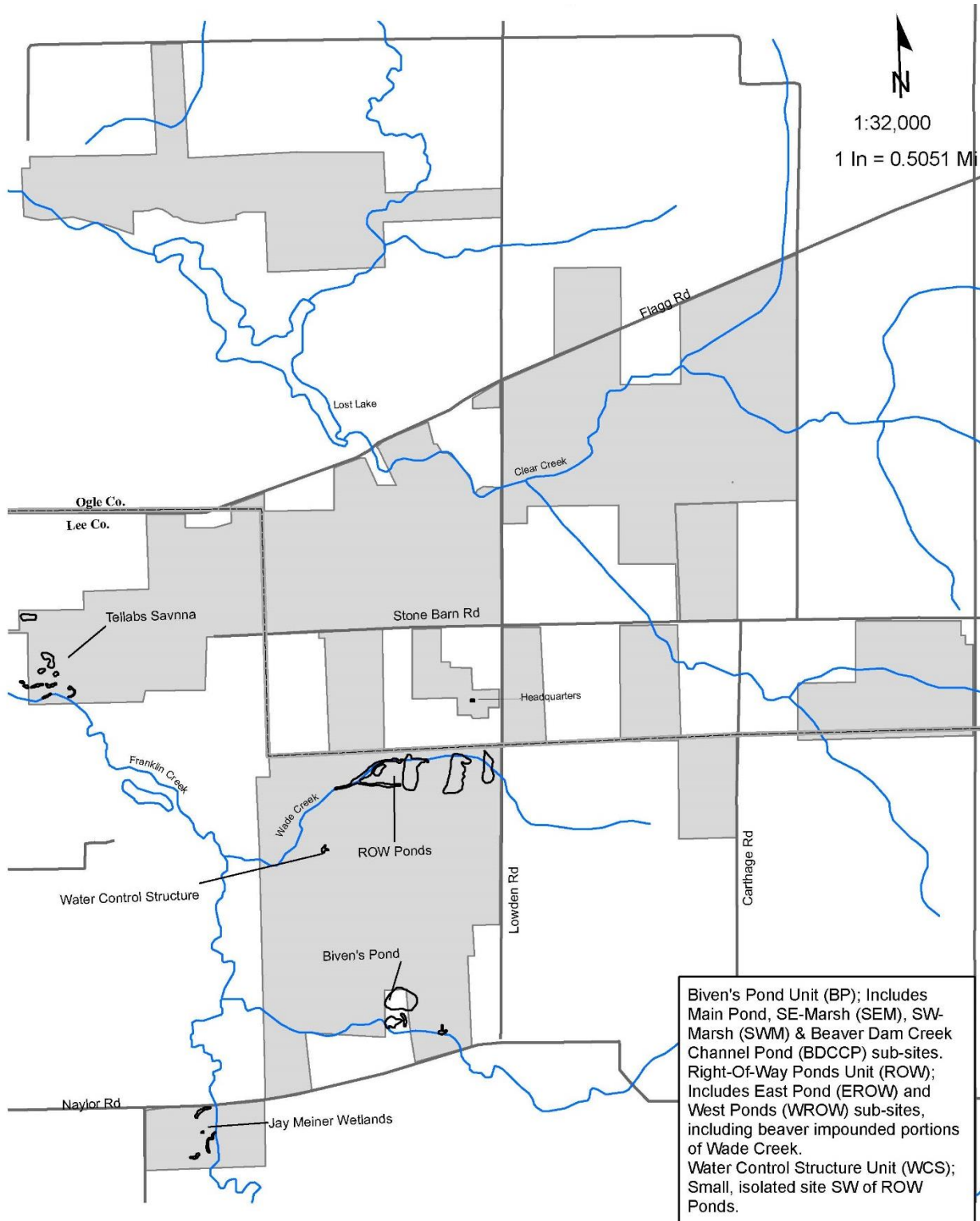


Figure 13. Occupied and potential Blanding's Turtle habitat at Nachusa Grasslands (this map appears as Fig. 1 in Mauger and Anton 2017).



Fig. 14. Images captured by trail cameras showing use of natural (upper) and artificial (lower) basking structures by Painted Turtles.

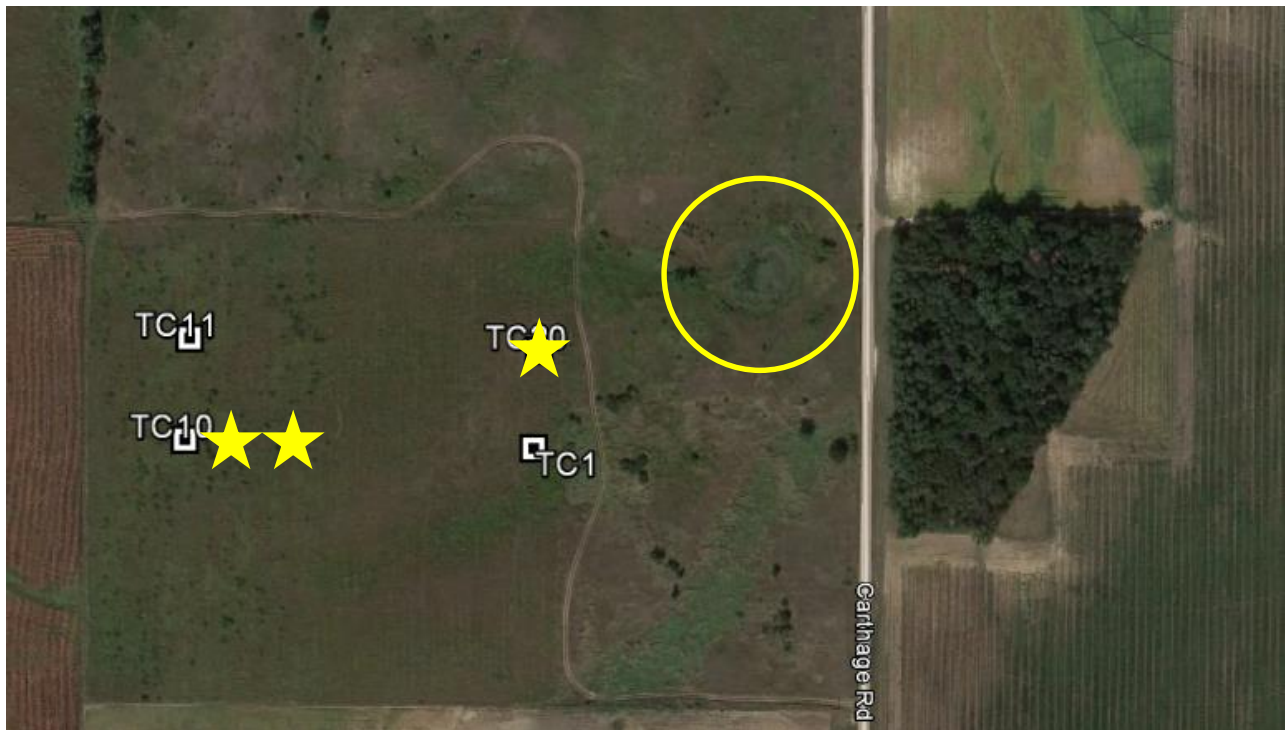


Figure 15. Approximate location (stars) in the Thelma Carpenter unit where adult Tiger Salamanders were observed 2015-2016. Tiger Salamander egg masses were found in the pond circled in yellow in both 2016 and 2017.



Figure 16. Tiger Salamander egg mass from pond at Thelma Carpenter unit, 22 March 2016 (left panel) and an adult Tiger Salamander found upland from the pond on 18 September 2015 (right panel). Five elongate partially developed Tiger Salamander larvae are visible along with numerous smaller partially developed Chorus Frog larvae.



Figure 17. Full dry condition of pond in Thelma Carpenter unit on 29 September 2017 following an extended period without rainfall.

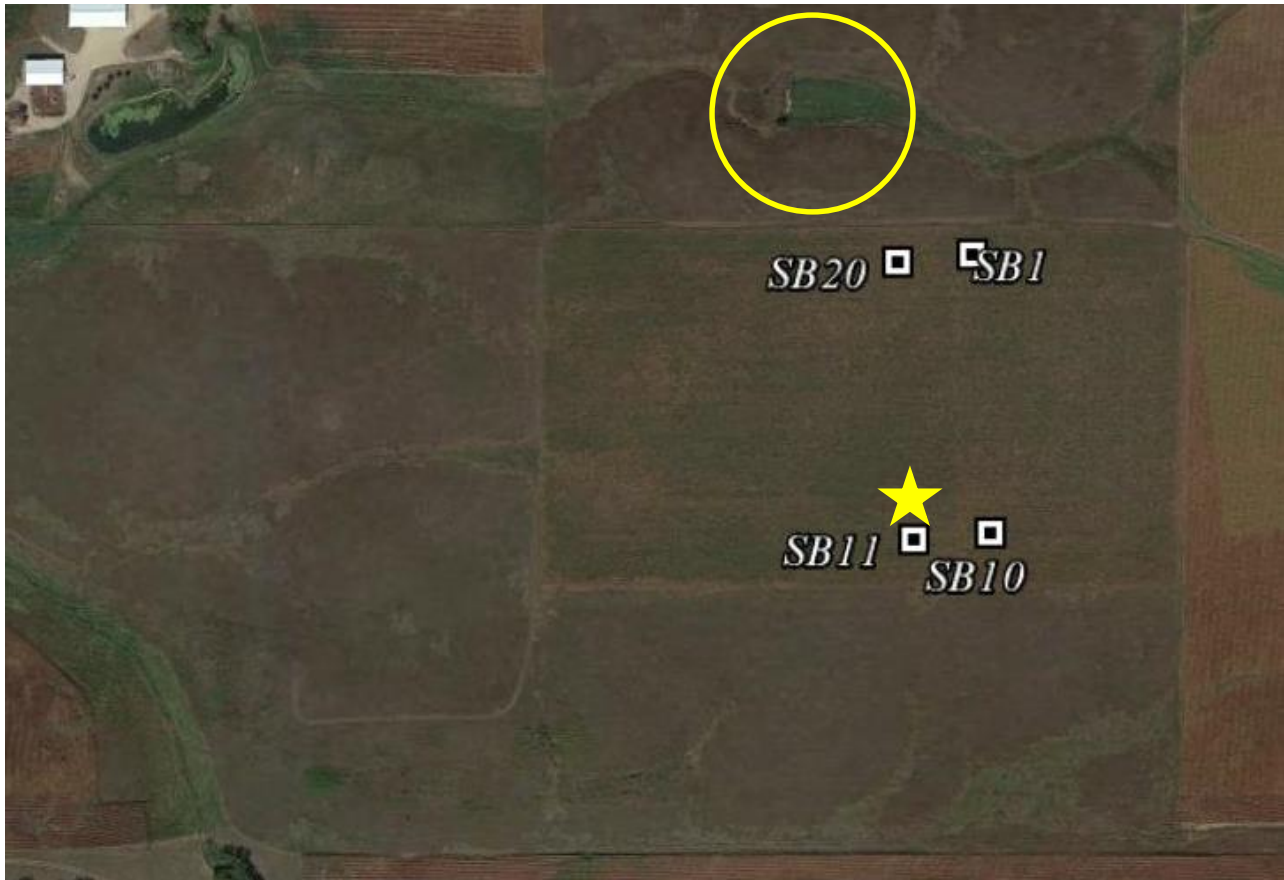


Figure 18. Approximate location (star) of coverboard 11 in the Stone Barn unit where an adult Tiger Salamander was observed in October 2016. No evidence of breeding was detected during a search for egg masses on 9 March 2017.

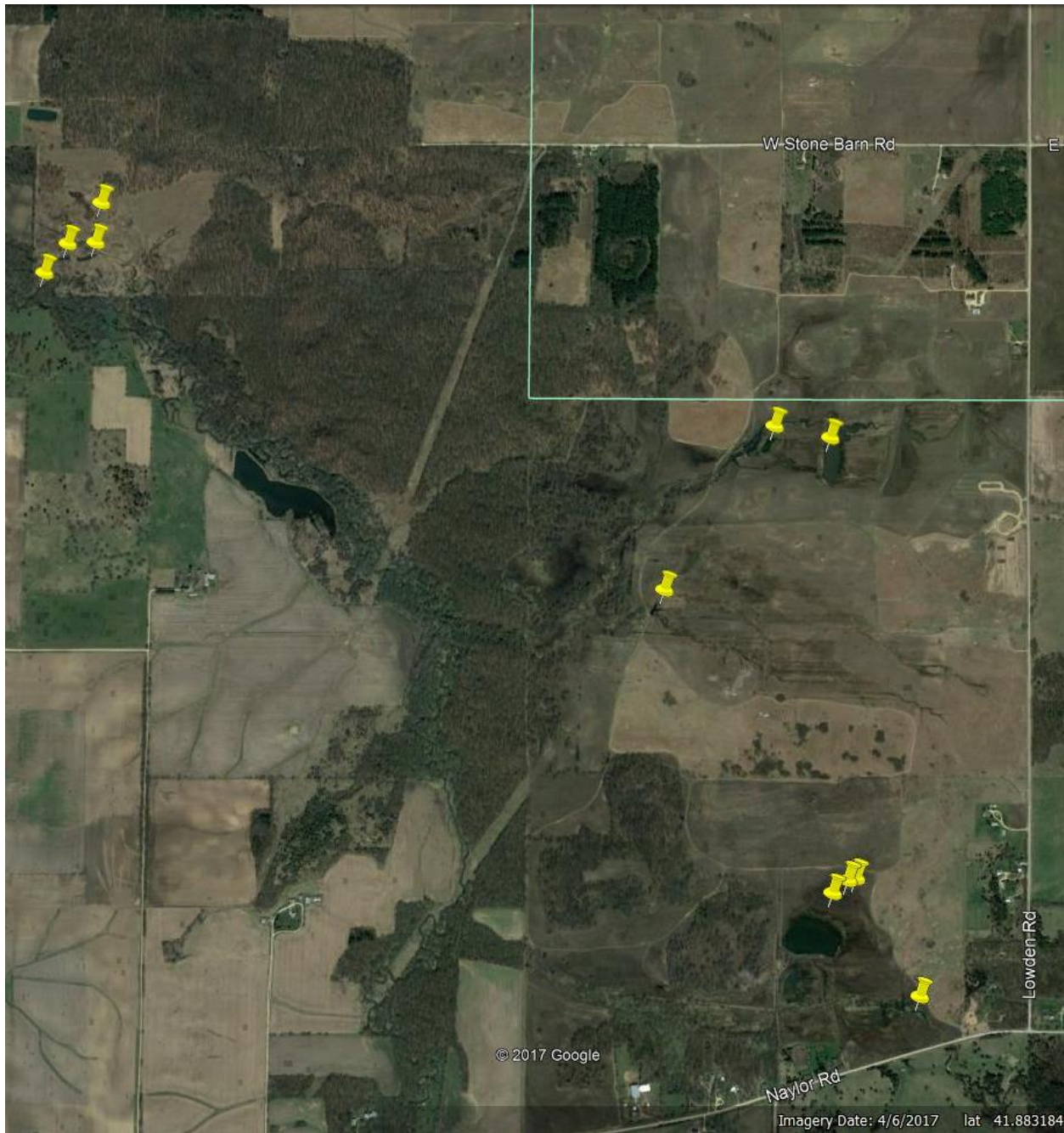


Figure 19. Wetland areas at Nachusa Grasslands searched without success for Tiger Salamander egg masses on 22 March 2016, 9 March 2017, and 24 March 2017.

Appendix: Dates of visits to Nachusa Grasslands, participants, and primary activities

| Date | Participants | Primary Activities |
|---------------|-------------------------|---|
| 7 Feb 2017 | King | Blanding's Turtle telemetry |
| 9 March 2017 | King, Vanek | Tiger Salamander survey |
| 24 March 2017 | King | Tiger Salamander survey, Blanding's turtle telemetry & reconnaissance |
| 20 April 2017 | King | Blanding's Turtle telemetry & reconnaissance |
| 25 April 2017 | King | Blanding's Turtle telemetry |
| 26 April 2017 | King | Release of newly transmittered Blanding's Turtle |
| 6 May 2017 | King, Mauger, Anton | Set turtle traps, Blanding's Turtle telemetry |
| 7 May 2017 | King, Mauger, Etheridge | Turtle trapping, Blanding's Turtle telemetry |
| 8-15 May 2017 | Mauger, Etheridge | Turtle trapping |
| 16 May 2017 | King | Blanding's Turtle telemetry & reconnaissance |
| 18 May 2017 | King, Etheridge | Blanding's Turtle telemetry |
| 30 May 2017 | King | Blanding's Turtle telemetry |
| 2 June 2017 | King, Vanek | Blanding's Turtle telemetry |
| 3 June 2017 | King | Blanding's Turtle telemetry |
| 4 June 2017 | Etheridge, King | Blanding's Turtle telemetry |
| 5 June 2017 | King | Blanding's Turtle telemetry |
| 6 June 2017 | Etheridge | Blanding's Turtle telemetry |
| 7 June 2017 | Etheridge, King | Blanding's Turtle telemetry |
| 8 June 2017 | Etheridge, King | Blanding's Turtle telemetry |
| 9 June 2017 | King | Blanding's Turtle telemetry |
| 10 June 2017 | King | Blanding's Turtle telemetry |
| 11 June 2017 | King | Blanding's Turtle telemetry |
| 12 June 2017 | King, Weickert | Blanding's Turtle telemetry |
| 13 June 2017 | King | Blanding's Turtle telemetry |
| 14 June 2017 | Etheridge | Blanding's Turtle telemetry |
| 15 June 2017 | Etheridge | Blanding's Turtle telemetry |
| 16 June 2017 | King | Blanding's Turtle telemetry |
| 18 June 2017 | King | Blanding's Turtle telemetry |
| 19 June 2017 | King | Blanding's Turtle telemetry |
| 20 June 2017 | Etheridge | Blanding's Turtle telemetry |
| 21 June 2017 | Etheridge | Blanding's Turtle telemetry |
| 22 June 2017 | Etheridge | Blanding's Turtle telemetry |
| 23 June 2017 | King, Vanek | Blanding's Turtle telemetry |
| 27 June 2017 | King | Checked integrity of next enclosures |
| 14 July 2017 | King, Etheridge | Blanding's Turtle telemetry |
| 19 July 2017 | King | Blanding's Turtle telemetry |
| 1-5 Aug 2017 | King, Etheridge | Turtle trapping, telemetry |
| 9 Aug 2017 | King | Blanding's Turtle telemetry, set trail cameras |
| 16 Aug 2017 | King | Blanding's Turtle telemetry, retrieved trail cameras |

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|----------------------|--------------------------------|---|
| 25 Aug 2017 | King | Blanding's Turtle telemetry, set trail cameras, checked Blanding's Turtle nests |
| 27 Aug 2017 | King | Serviced trail cameras, checked Blanding's Turtle nests |
| 28 Aug – 14 Sep 2017 | King, Etheridge, &/or Weickert | Checked Blanding's Turtle nests |
| 3 Sep 2017 | King | Serviced trail cameras |
| 10 Sep 2017 | King | Serviced trail cameras |
| 12 Sep 2017 | King | Retrieved, measured, and released hatchlings from nest enclosure |
| 15 Sep 2017 | King | Blanding's Turtle telemetry |
| 16 Sep 2017 | King | AOTF Blanding's Turtle tour, serviced trail cameras |
| 17 Sep 2017 | King | Retrieved hatchlings from 2 nest enclosures |
| 19 Sep 2017 | King, Etheridge, Weickert | Measured and released hatchlings |
| 29 Sep 2017 | King | Serviced trail cameras, reconnaissance |
| 6 Oct 2017 | King | retrieved trail cameras |
| 20 Oct 2017 | King | Blanding's Turtle telemetry |
| 5 Dec 2017 | King | Blanding's Turtle telemetry |