

FEDERALLY PROTECTED BAT SURVEY REPORT

**Eastern North Carolina
Northern Long-eared Bat (*Myotis septentrionalis*) Research Study
Camden, Currituck, and Gates Counties
North Carolina**

Survey Phase V Winter 2017/2018

TIP R-9999

WBS No. 34634.1.4

Prepared for



**The North Carolina Department of Transportation
Environmental Analysis Unit
Natural Environment Section
1598 Mail Service Center
Raleigh, NC 27699-1598
(919) 707-6000**

FINAL VERSION

June 2018

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1.0 PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) hired CALYX Engineers + Consultants, Inc. (CALYX) to assist in conducting portions of a research study of the northern long-eared bat (*Myotis septentrionalis*; MYSE) in eastern North Carolina. The objective of this study is to determine the behavior of MYSE during the fall and winter in eastern North Carolina.

NCDOT tasked CALYX with surveying three locations in eastern North Carolina: Dismal Swamp State Park, Merchants Millpond State Park, and North River Game Land (Table 1). The field season was divided into two Sessions: Session 1 ran from November 15 to December 20, 2017, Session 2 went from December 27, 2017 to February 28, 2018. All mist-netting was completed between November 16, 2017 and February 11, 2018. Telemetry was completed Between December 16 2017 to March 4, 2018. All locations that were sampled are shown in Figure 1.

Table 1. Eastern NC MYSE Research Study Locations – 2017/2018

Location	County	Owner
Dismal Swamp State Park	Camden	NC State Park
Merchants Millpond State Park	Gates	NC State Park
North River Game Land	Camden	NC Wildlife Resources Commission
	Currituck	

2.0 SPECIES INFORMATION

MYSE was officially listed by the United States Fish and Wildlife Service (USFWS) as a Threatened species in April of 2015 (USFWS 2016a). The listing became effective May 2, 2015. USFWS also established a final rule under the authority of section 4(d) of the Endangered Species Act that provides measures for the conservation of MYSE. The USFWS has tailored the final 4(d) rule to prohibit the take of MYSE from certain activities within areas where they are in decline. This incidental take protection applies only to known MYSE occupied maternity roost trees and known MYSE hibernacula.

MYSE occurs widely across much of Canada and the southeastern United States but is unevenly distributed and rarely found in large numbers. It is more common in the northern part of its range than in the southern portion. In North Carolina, MYSE have primarily been documented in the western portion of the state, with more recent records from the Coastal Plain.

Winter hibernacula for the MYSE in western North Carolina includes caves and mines. Hibernacula/winter roosts in central and eastern North Carolina may include other landscape features. Suitable summer habitat for MYSE is generally characterized as forested areas with trees over 3 inches in diameter at breast height (DBH). Summer roost sites include tree cavities or crevices, the loose bark of live or dead trees, and abandoned buildings (USFWS 2017a).

3.0 METHODS

This section describes the methods used to perform surveys and habitat assessments. All survey methods followed the procedures and protocols set forth by the scope of work, including the NCDOT Standardization for MYSE Research 2016 (NCDOT 2016). This included all or part of USFWS 2017 Range-wide Indiana Bat Summer Survey Guidelines (USFWS 2017b) for the

USFWS Southeast Region. Decontamination protocols followed USFWS National White Nose Syndrome Decontamination Protocol (USFWS 2016b), and North Carolina's White-nose Syndrome Surveillance and Response Plan (NCWRC 2013).

No caves, mines, abandoned structures, bridges or other potential non-tree roost sites were investigated as part of this study.

3.1 Mist-Net Surveys

CALYX biologists sampled 22 net sites (Table 2) using mist netting techniques (see Appendix A). Phase V (USFWS 2017a) mist-netting was conducted with the goal of catching the target species, MYSE. Once a MYSE was captured, a transmitter was attached to the bat and radio-tracking began for 21 days, or the life of the transmitter, for each bat.

The highest quality foraging/roosting habitat for MYSE within each location was targeted for this study. A CALYX biologist determined how many nets to set each night, erecting a minimum of 4 nets, using best professional judgement at each location. Actual mist-net placement varied from night to night within a location. The specific location and orientation of each net was determined in the field by the permitted biologist. Digital photographs were taken of each net site and net set placement (Appendix B).

Nets were checked for bats every ten minutes, and sometimes more frequently. Data was recorded within a digital app and printed to a data sheet template provided by NCDOT (Appendix A), including bat captures, weather, and habitat type. For each bat capture, data collection included a variety of parameters, including (but not limited to) time of capture, species, age, sex, reproductive condition, weight, and right forearm length. Per the request of NCWRC all species were banded with a uniquely-numbered, custom-fitted Porzana band on the right forearm of males and left forearm of females. Prior to release, all *Myotis* were photographed following techniques provided by USFWS in the 2017 Indiana bat survey guidelines (Appendix C). The natural community type for each mist net site was determined per Schafale and Weakley (1990).

Nets remained open at least five hours each night. Surveys were repeated if the following occurred: winds move the nets more than 50 percent of the time; and rain or fog that persists for 30 minutes or continues intermittently throughout the survey period; temperatures fell below 40° F. A night was considered complete if at least 3 hours of netting were accomplished.

3.2 Radio-Tracking and Emergence Surveys

During surveys, all captured MYSE were fitted with 21-day radio transmitters (ATS Model #A2414, 23-day, 24 pulse per minute, 0.3 grams). CALYX was originally tasked with deploying eight (8) transmitters, with the possibility of more, with no more than four (4) being on bats during Session 1. Transmitters were attached following 2017 Indiana Bat Summer Survey Guidelines (USFWS 2017b), and transmitter frequencies were noted on data sheets. Bats were tracked daily to roosts. If the roost could not be located, tracking continued up to a maximum of 8 hours. Tracking was primarily conducted via terrestrial telemetry, with a handheld three or five-element Yagi antenna and a hand-held receiver (ATS R410 Scanning Receiver). When the transmitter signal was lost, and after consultation with USFWS and NCDOT, a fixed wing aircraft was used for aerial tracking.

Once a roost site was located, it was flagged, and roost tree data was collected using the USFWS Indiana Bat Roost Datasheet, (USFWS 2017b). Field data included geographic coordinates, type of roost, bat number (transmitter frequency) of the bat using the roost, tree species, diameter at

breast height (dbh) of tree, roost height (if known), cavity description (if known), total tree height, tree condition (live, snag), and percent bark cover.

All known roost tree sites had at least one emergence count performed at the site to record bat activity, using the USFWS Bat Emergence Survey Datasheet (USFWS 2017b). Some roosts had multiple emergence surveys conducted to better understand MYSE activity. Surveys began one-half hour before dusk and ended up to one hour after dusk. Emergence surveys were not conducted if temperatures fell below 45°F or if there was rain, heavy fog, or high winds. A detailed list of roost tree and emergence count surveys is presented in Table 3.

3.3 Habitat Analysis

Prior to performing field surveys, a desktop-GIS assessment using the latest orthoimagery was performed to determine availability of potentially suitable habitat for MYSE within each location. This information was utilized to aid in scouting for mist-netting sites. On-site scouting was conducted prior to netting to locate potential mist-net sites.

The natural community types were characterized using the *Classification of the Natural Communities of North Carolina, Third Approximation* (Shafale and Weakley 1990) where mist-net surveys were conducted. In addition, for each site where MYSE were captured, habitat in the survey area was scored using the following (circling one for each, 1-6) (Table 4):

- 1) pine/hardwood/mixed/unforested
- 2) upland/bottomland
- 3) managed (thinned, burned, or pine plantation)/unmanaged
- 4) cutover/immature forest/mature forest
- 5) clutter (Classifications 1-4)
 - (1) sparse/no, < 10% cover (ex: open for 40m in all directions)
 - (2) low, 10–39% cover (low clutter stands typically contain <6 or >95-year-old trees, ex: microphone pointed outward from edge habitat)
 - (3) medium, 40–75% cover (medium clutter stands typically contain 70–100-year-old trees, ex: at least 10-m wide travel corridor, fairly open above)
 - (4) high, > 75% cover (high clutter stands typically contain 10–25-year-old trees, ex: closed canopy & travel corridor < 10-m wide)
- 6) natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

In addition to mist-net locations, the above score was determined at all roost tree sites (Table 4).

4.0 FINDINGS

This section describes the results of mist net, roost tree, and emergence count surveys and habitat analysis. In general, nets were placed to sample potential travel corridors such as ATV trails, utility corridors, or streams. Edge habitat was utilized when other potential travel corridors were not available.

4.1 Mist-Net Surveys

Netting was conducted between November 16, 2017 and February 11, 2018 from approximately sunset to five hours after sunset, Eastern Daylight Time. Mist-net surveys were performed with the goal of capturing MYSE. Net deployments were individually tailored to flight corridors within the highest quality foraging/roosting habitat available within each survey location. Configurations

utilized combinations of nets sized between 2.6 and 18 meters in length, stacked between one net panel (single high) and three net panels (triple high) in height. The number of net sets and individual net placement varied from site to site and were determined in the field each night by experienced CALYX biologists. At least four net sets were deployed each night. However, an effort was always made to deploy as many net sets as possible, given the time available and while allowing for each net to be checked every ten minutes. Each mist net site was photographed (Appendix B), and a GPS point for the site was recorded. Figures 2-4 depict the locations of mist-net sites at each of the three (3) sampled project locations.

Mist-netting locations and number of bats per locations are presented in Table 2. Mist net captures were documented on data sheets provided by NCDOT which were designed to capture the same information as that contained in the USFWS Sample Data Sheet for Indiana Bat Surveys (USFWS 2017a). Twenty-nine (29) total net nights were attempted (with 3 wind/rain/cold outs) at twenty-two (22) sites. The survey efforts resulted in the capture of thirty-four (34) bats representing five species (and 1 unknown *Myotis* species due to escaping prior to identification). Photos and data sheets for each mist net site are provided in Appendices A and B. MYSE photographs are provided in Appendix C. MYSE were identified with a code, starting with a letter (M if male, F if female), followed by a three-digit number (the last three numbers of each MYSE transmitter frequency). Four (4) MYSE were captured in Session 1 (M104, M144, M044, and M064); six (6) MYSE were caught (and five transmitted) during Session 2 (F084, M004, M164, M184, M204).

Table 2. Mist-Net Capture Summary

Location	Site Name	Night	Date	Community Type (MYSE Net Sites)	CORA	LABO	MYAU	MYLU	MYSE	Myotis	Total	Comments
Dismal Swamp State Park	DS-01	1	1/23/2018		-	-	-	2	-	1	3	Unknown Myotis escaped from net (possible MYAU)
	DS-05	1	1/23/2018	Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	-	-	-	1	1	-	2	F084 (58°F)
		2	2/1/2018		-	-	-	-	-	-	0	
	DS-09	1	1/22/2018		-	-	-	-	-	-	0	
	DS-14	1	1/22/2018		-	-	-	-	-	-	0	
DS-15	1	2/1/2018		-	-	-	-	-	-	0		
Merchants Millpond State Park	MM-02	1	12/2/2017	Mesic Mixed Hardwood Forest (Coastal Plain Subtype); Small Stream Swamp (Blackwater Subtype)	-	-	-	-	1	-	1	M044 (49°F)
	MM-03	1	2/9/2018		-	-	-	-	-	-	0	
	MM-10	1	2/9/2018		-	-	-	-	-	-	0	
	MM-12	1	2/6/2018		-	-	-	-	-	-	0	
	MM-13	1	11/16/2017	Small Stream Swamp (Blackwater Subtype)	-	-	2	2	2	-	6	M104 (46°F) and M144 (46°F)
		2	2/6/2018		-	-	1	-	-	-	1	
	MM-14	*1	1/12/2018		-	-	-	-	-	-	0	Rain/wind out at 19:30
		2	2/10/2018		-	-	-	-	-	-	0	
	MM-15	1	2/11/2018	Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	-	-	-	-	1	-	1	M184 (72°F)
MM-16	1	2/10/2018		-	-	2	-	-	-	2		
MM-18	*1	1/12/2018		-	-	-	-	-	-	0	Rainout at 19:30	
MM-19	1	2/11/2018	Mesic Mixed Hardwood Forest (Coastal Plain Subtype); Cypress-Gum Swamp (Blackwater Subtype)	1	1	-	-	3	-	5	M164 (72°F), M204 (72°F) and a non-transmittered male MYSE (71°F)	
North River Game Land	NR-01	*1	11/27/2017		-	-	-	-	-	-	0	Cold out
		2	1/10/2018		1	1	-	-	-	-	2	Caught great blue heron in net
	NR-02	1	1/21/2018		-	-	1	-	-	-	1	
	NR-04	1	1/20/2018	Cypress-Gum Swamp (Blackwater Subtype)	-	-	-	-	1	-	1	M004 (48°F)
	NR-05	1	11/28/2017	Cypress-Gum Swamp (Blackwater Subtype)	-	1	-	-	1	-	2	M064 (53°F)
		2	1/11/2018		-	2	-	-	-	-	2	Recapture of LABO caught 11/28/2017 at NR-05
	NR-07	1	11/25/2017		-	-	-	-	-	-	0	
	NR-11	1	1/11/2018		-	2	2	-	-	-	4	
		2	1/20/2018		-	-	-	-	-	-	0	
	NR-12	*1	1/9/2018		-	-	-	-	-	-	0	Cold out at 18:23
2		1/10/2018		-	-	-	-	-	-	0		
	3	1/21/2018		-	-	1	-	-	-	1		
Total					2	7	9	5	10	1	34	

CORA = *Corynorhinus rafinesquii*, Rafinesque's Big-eared Bat; LABO = *Lasiurus borealis*, Eastern Red Bat; MYAU = *Myotis austroriparius*, Southeastern Bat; MYLU = *Myotis lucifugus*, Little Brown Bat; MYSE = *Myotis septentrionalis*, Northern Long-eared Bat; Myotis = Unknown *Myotis* species.

Indicates MYSE captured at mist-net site.

* = Netting not Completed; rain or wind out.

4.2 Radio-Tracking and Emergence Surveys

Ten (10) total MYSE bats were captured during this project. Transmitters were applied to nine (9) of them. Radio-tracking was performed on all nine (9) MYSE that were radio-tagged during the project. Eight (8) were tracked to roosts. F084, caught at Dismal Swamp State Park, was located by aerial telemetry, and triangulation coordinates were collected (approximately 15.5 km away from the capture site), but the signal terminated after 7 days before a tree could be located (Figures 2c and 2d). All other bat transmitters were tracked to roost trees, which varied by species, but were generally located in cypress-gum swamp habitat or mesic mixed hardwood forest (Table 3). Seven (7) MYSE were caught at Merchants Millpond (one was not transmitted). The non-transmitted bat was caught after the last of the transmitters had been deployed. The furthest roost tree from capture site at Merchants Millpond State Park was 9.4 km by M184 (Figure 3h). Both MYSE captured at North River Game Land (M004 and M064) only had one roost tree apiece (Figure 4c). A detailed description of all roost trees and emergence counts can be found in Table 3. All roost descriptions and photographs are located in Appendix D.

Emergence counts were performed at all located roost trees. All results are presented in Table 3. The minimum distance a bat traveled to a roost tree from its capture site was 42.23 m (M204); the max was 15.42 km (F084) (Table 4). Refer to Appendix E for emergence datasheets.

Table 3. Roost Tree and Emergence Summary

Site	MYSE Sex/Freq.	Band No.	Dates Tracked (Total Days)	Community Type	Tree Species	Roost No.	Latitude	Longitude	Roost Dates	Emergence		Comments	
										Date	# Observed Emerging		
Dismal Swamp State Park	F084	CALYX 0402	1/24-1/29 (7)	Unknown	Unknown	1	36.428400	-76.356800	1/27	-	-	Approximate location determined by airplane.	
					Unknown	2	36.427608	-76.359487	1/28	-	-	Triangulation. Signal died while attempting to locate roost.	
Merchants Millpond State Park	M044	CALYX 1001	12/3-12/23 (21)	Cypress-Gum Swamp (Blackwater Subtype)	Unknown	1	36.446628	-76.688210	12/3	-	-	Triangulation. Off state park property.	
					Taxodium ascendens	2	36.436207	-76.695431	12/4-12/5	12/4	0		
					Unknown	3	36.446635	-76.688473	12/6	-	-	Triangulation. Off state park property.	
					Taxodium ascendens	4	36.422970	-76.711750	12/7-12/15 12/17-12/19 12/21-12/23	12/7	0		
					Taxodium distichum	5	36.435950	-76.695670	12/16, 12/20	12/16	0		
	M104	CALYX 0792	11/17-12/10 (24)	Small Stream Swamp (Blackwater Subtype)	Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	Liquidambar styraciflua	0	36.431510	-76.701690	11/17	-	-	Bat was originally located in roost 0. Bat moved during the day after mild disturbance at roost and went to roost 1.
					Taxodium distichum	1	36.429840	-76.698680	11/17-11/18	11/17	0		
					Nyssa aquatic	2	36.430920	-76.700410	11/19	11/18	3	Tagged bat was last to emerge (62°F at emergence for all 3 bats)	
					Taxodium distichum	3	36.431010	-76.700600	11/20-11/25, 11/27-11/29	11/19	1	Tagged bat emerged (68°F)	
					Nyssa aquatic	4	36.431200	-76.699090	11/26	11/20	0		
					Taxodium distichum	5	36.430190	-76.699960	11/30-12/10	11/26	1	Tagged bat emerged (46°F)	
	M144	CALYX 0751	11/17-12/14 (28)	Small Stream Swamp (Blackwater Subtype)	Unknown	1	36.424492	-76.708191	11/18/2017	-	-	Triangulation. Off state park property.	
					Unknown	2	36.424262	-76.707951	-	-	-	Triangulation. Off state park property.	
					Nyssa aquatica	3	36.424570	-76.707870	11/28-12/6	11/28	0		
					Nyssa aquatica	4	34.422970	-76.711750	12/7-12/13	12/7	0		
	M164	CALYX 0361	2/12-3/4 (21) *lost signal 2/16	Small Stream Swamp (Blackwater Subtype)	Nyssa aquatic	1	36.430543	-76.699643	2/12-2/15	2/14	1	M164 moved to roost 2 just prior to emergence. Emergence was done on both 1 and 2 (M164 left tree during emergence) (49°F).	
					Taxodium distichum	2	36.432560	-76.697660	2/14	2/14	1		
M184	CALYX 0411	2/12-3/4 (21) *signal not detected until 2/14	Small Stream Swamp (Blackwater Subtype)	Nyssa aquatica	1	36.470645	-76.772482	2/17-2/24	2/18	0			
				Fraxinus caroliniana	2	36.470037	-76.774203	2/25	2/25	1	Tagged bat emerged (71°F).		
				Fraxinus sp.	3	36.469.491	-76.774699	2/26-3/4	2/26	0			
M204	CALYX 0360	2/12-3/4 (21)	Small Stream Swamp (Blackwater Subtype)	Taxodium distichum	1	36.431840	-76.697530	2/13-2/16	2/14	2	Tagged bat did not emerge (50°F).		
				Taxodium distichum	2	36.432510	-76.697580	2/20	2/20	2	Tagged bat left last (65°F at emergence for both bats).		
North River Game Land	M004	CALYX 0356	1/21-2/10 (21)	Cypress-Gum Swamp (Blackwater Subtype)	Nyssa aquatica	1	36.263870	-75.994180	1/21-2/10	1/21	0		
	M064	CALYX 0441	11/29-12/9 (11) *lost signal 12/10		Liquidambar styraciflua	1	36.270450	-75.985740	11/29-12/9	11/29	1	Bat emerged, circled the roost and returned to the roost within 10 minutes (53°F)	

Table 4. Roost Tree Distance from Capture Site

Bat ID	Capture Site	Roost No.	Distance from Capture Site to Roost
F084	DS-05	1	15.35 km
		2	15.42 km
M044	MM-02	1	1.49 km
		2	191.29 m
		3	1.48 km
		4	214.35 m
		5	232.83 m
M104	MM-13	0	144.91 m
		1	269.24 m
		2	55.97 m
		3	49.16 m
		4	206.33 m
M144	MM-13	5	121.92 m
		1	1.23 km
		2	1.27 km
		3	1.27 km
M164	MM-19	4	1.69 km
		1	331.74 m
		2	65.90 m
M184	MM-15	3	9.41 km
		2	9.53 km
		3	9.53 km
M204	MM-19	1	42.23 m
		2	56.08 m
M004	NR-04	1	1.83 km
M064	NR-05	1	345.94 m

 Maximum and minimum distance traveled from capture site to roost tree

4.3 Habitat Analysis

Habitat types found at each MYSE capture mist net site were characterized per Classification of the Natural Communities of North Carolina, Third Approximation (Schafale and Weakley 1990). The habitat type for each mist net site is shown in Table 2. In total, MYSE captures occurred within three (3) different habitat types: Cypress-Gum Swamp (Blackwater Subtype), Mesic Mixed Hardwood Forest (Coastal Plain Subtype), and Small Stream Swamp (Blackwater Subtype). Roost trees were also located in three (3) different habitat types (Table 3).

In addition to habitat classifications, each mist-net location where a MYSE was captured and MYSE roost tree location were scored using the following categories:

1. pine/hardwood/mixed
2. upland/bottomland
3. managed (thinned, burned, or pine plantation)/unmanaged
4. cutover/immature forest/mature forest
5. natural (>50% wooded), rural (<50% agricultural land), mixed (primary land use is not wooded or agricultural)
6. clutter (Classifications 1-4: system modified from O’Keefe 2009 and Law 2002).

All classifications for mist-net and roost tree sites can be found in Table 5.

Table 5. Habitat Analysis Breakdown of MYSE Mist-Net Sites and Roost Tree Locations

Location	Type	Name	Pine Hardwood or Mixed	Upland or Bottomland	Managed or Unmanaged	Cutover, Immature, or Mature Forest	Natural or Rural	Clutter (1-4)
Dismal Swamp SP	MN	DS-05	Hardwood	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	MN	MM-02	Mixed	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	MN	MM-13	Mixed	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	MN	MM-15	Mixed	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	MN	MM-19	Hardwood	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	RT	M044-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M044-2	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M044-3	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M104-0	Mixed	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	RT	M104-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	2
Merchants Millpond SP	RT	M104-2	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M104-3	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M104-4	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M104-5	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M144-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	2
Merchants Millpond SP	RT	M144-2	Hardwood	Bottomland	Unmanaged	Mature	Natural	2
Merchants Millpond SP	RT	M162-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	2
Merchants Millpond SP	RT	M164-2	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M184-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	RT	M184-2	Hardwood	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	RT	M184-3	Hardwood	Bottomland	Unmanaged	Mature	Natural	3
Merchants Millpond SP	RT	M204-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
Merchants Millpond SP	RT	M204-2	Hardwood	Bottomland	Unmanaged	Mature	Natural	1
North River GL	MN	NR-04	Mixed	Bottomland	Unmanaged	Mature	Natural	3
North River GL	MN	NR-05	Mixed	Bottomland	Unmanaged	Mature	Natural	3
North River GL	RT	M004-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	2
North River GL	RT	M064-1	Hardwood	Bottomland	Unmanaged	Mature	Natural	2

MN = Mist-net Site
RT = Roost Tree

5.0 REFERENCES

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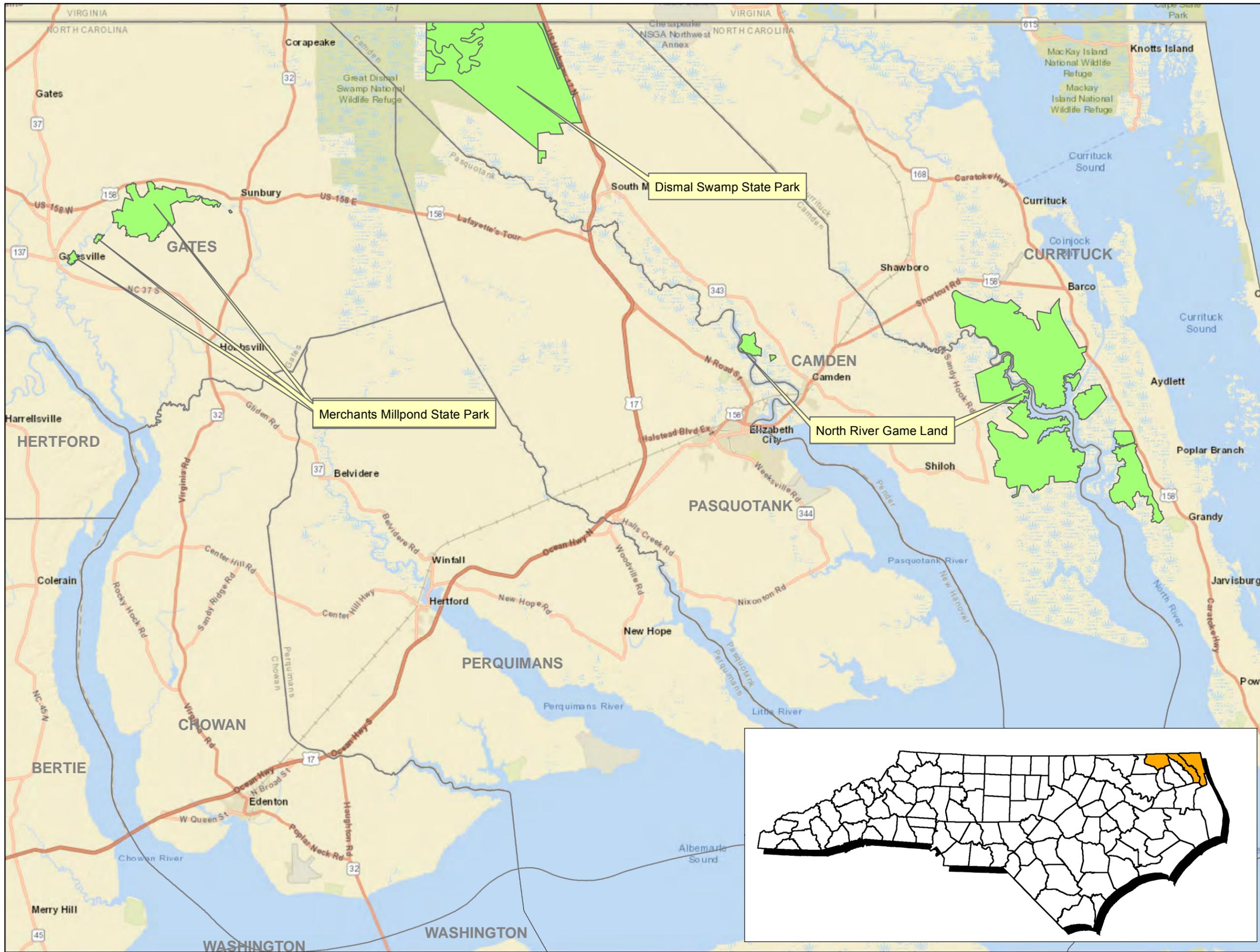
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<https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2017INBASummerSurveyGuidelines9May2017.pdf>

FIGURES



Legend

- Study Locations
- County Boundaries

FIGURE 1

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

Project Area Overview

**Camden, Currituck, and
Gates Counties, NC**

Map Date: 4/11/2018

N

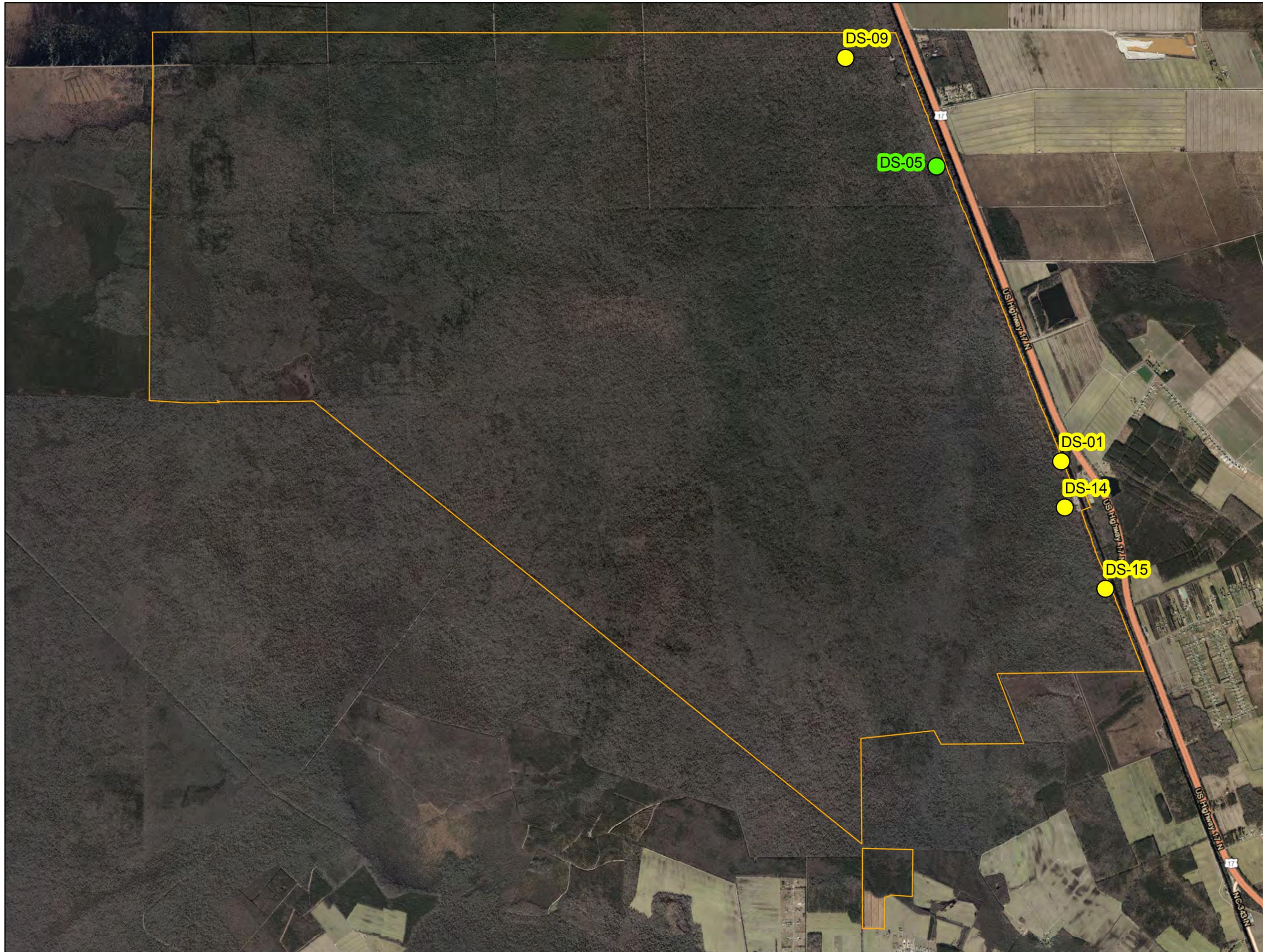
GRAPHIC SCALE

0 3 6 9 12

Kilometers

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Sources:
Aerial Photography: NC Center for Geographic Analysis
World Street Map: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia.



Legend

Netting Locations

- Net Sites
- MYSE Capture Site
- Dismal Swamp SP

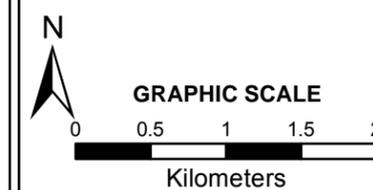
FIGURE 2a

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

**Dismal Swamp SP
Overview**

Camden County, NC

Map Date: 4/11/2018



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Aerial Photography: NC Center for Geographic Information Analysis
World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Netting Locations

 MYSE Capture Site

Nets

 Net Locations

 MYSE Capture Net

 Dismal Swamp SP

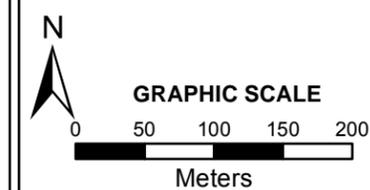
FIGURE 2b

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

**Dismal Swamp SP
MYSE Net Site
(DS-05)**

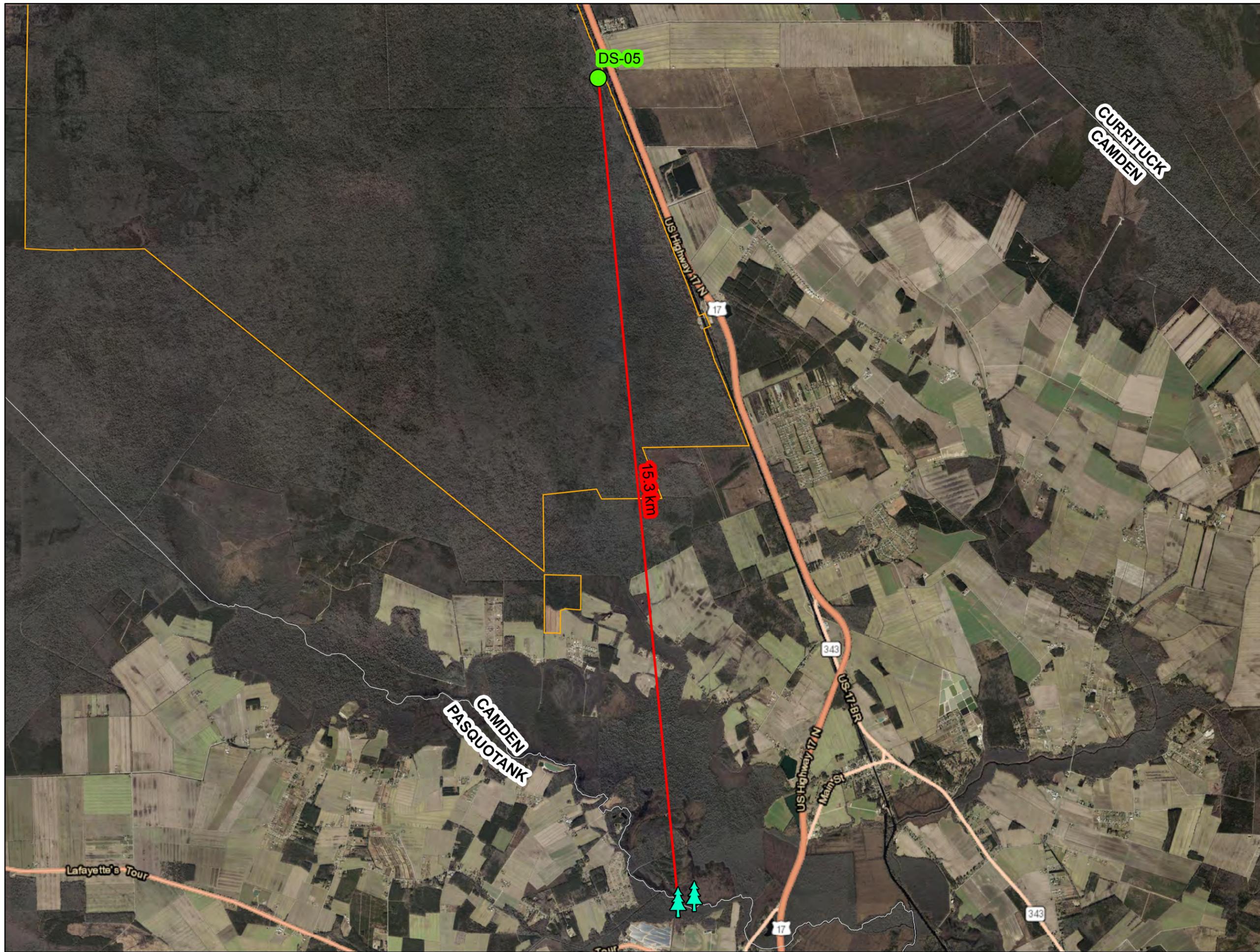
Camden County, NC

Map Date: 4/11/2018



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Sources:
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World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

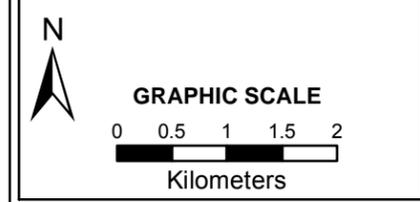
- MYSE Capture Site
- 🌲 F084 Roost Trees
- Roost Tree Distances
- Dismal Swamp SP
- County Boundaries

FIGURE 2c

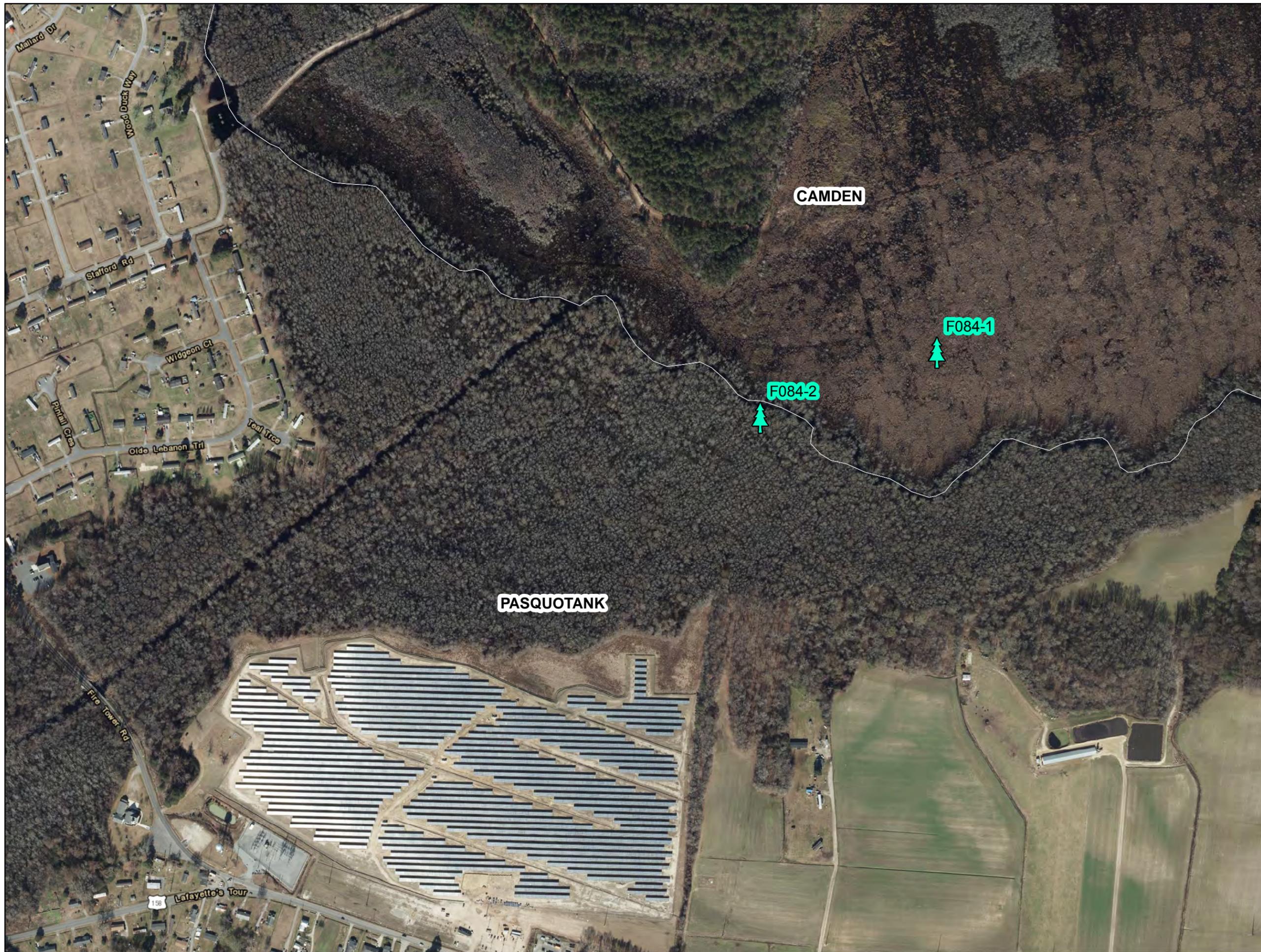
NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018

Dismal Swamp SP
F084
Roost Tree Overview
Camden and Pasquotank
Counties, NC

Map Date: 4/11/2018



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Legend

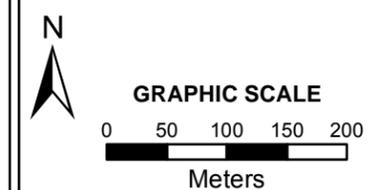
-  F084 Roost Trees
-  County Boundaries

FIGURE 2d

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

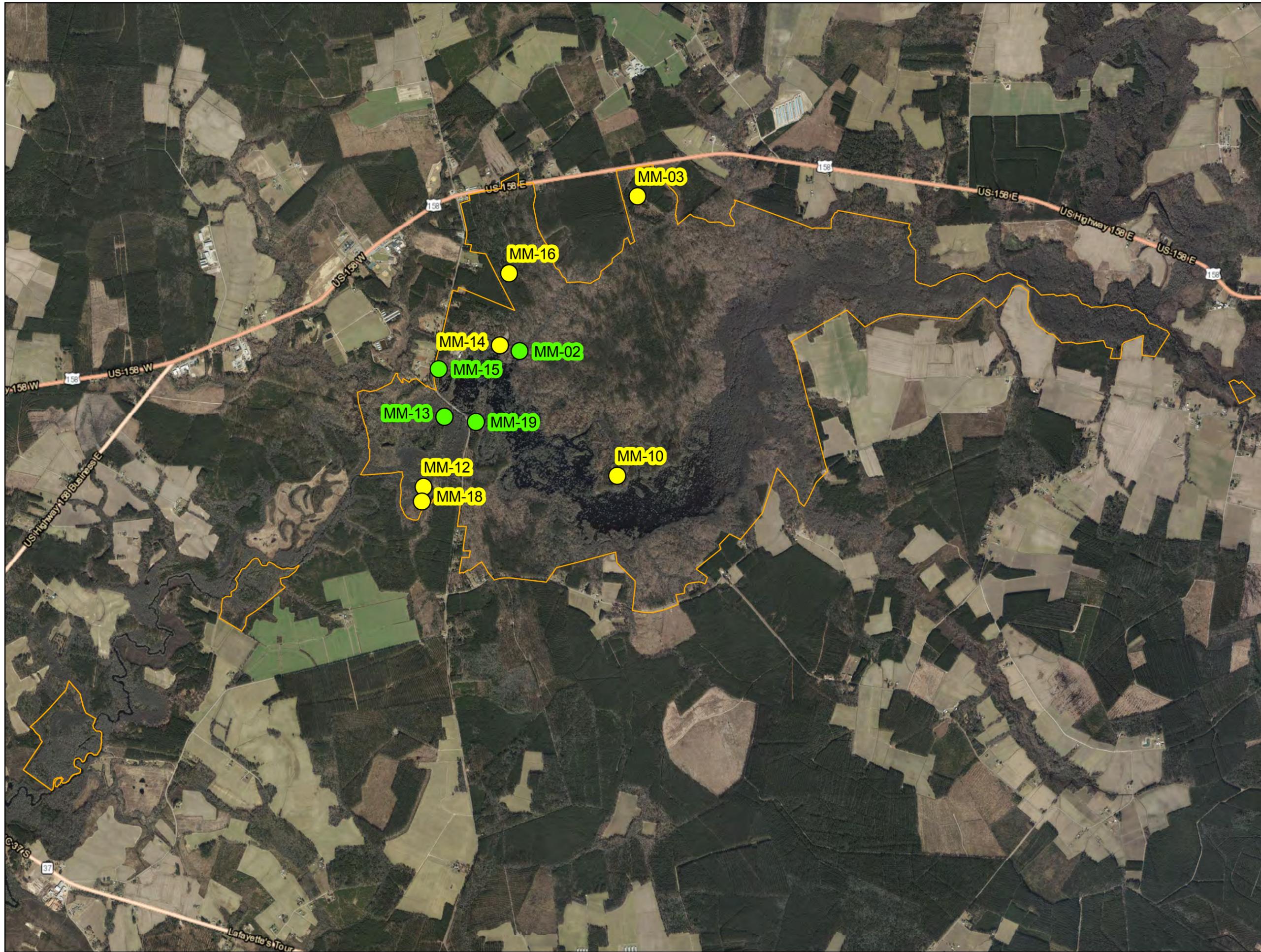
**Dismal Swamp SP
F084
Roost Trees
Camden and Pasquotank
Counties, NC**

Map Date: 4/11/2018



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Aerial Photography: NC Center for Geographic Information Analysis
World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



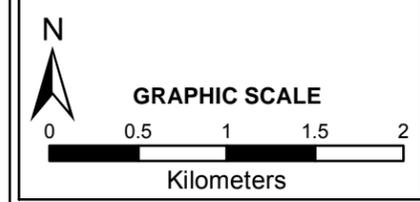
Legend

Netting Locations

- Net Sites
- MYSE Capture Site
- Merchants Mill Pond SP

FIGURE 3a

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018
Merchants Millpond SP
Overview
Gates County, NC
 Map Date: 4/11/2018



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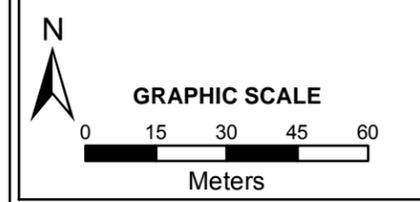


Legend

- MYSE Capture Site
- Nets**
- ▲ Net Locations
- ▲ MYSE Capture Net
- Roost Trees**
- ▲ M104 Roost Tree
- ▲ M204 Roost Tree
- ▲ M164 Roost Trees

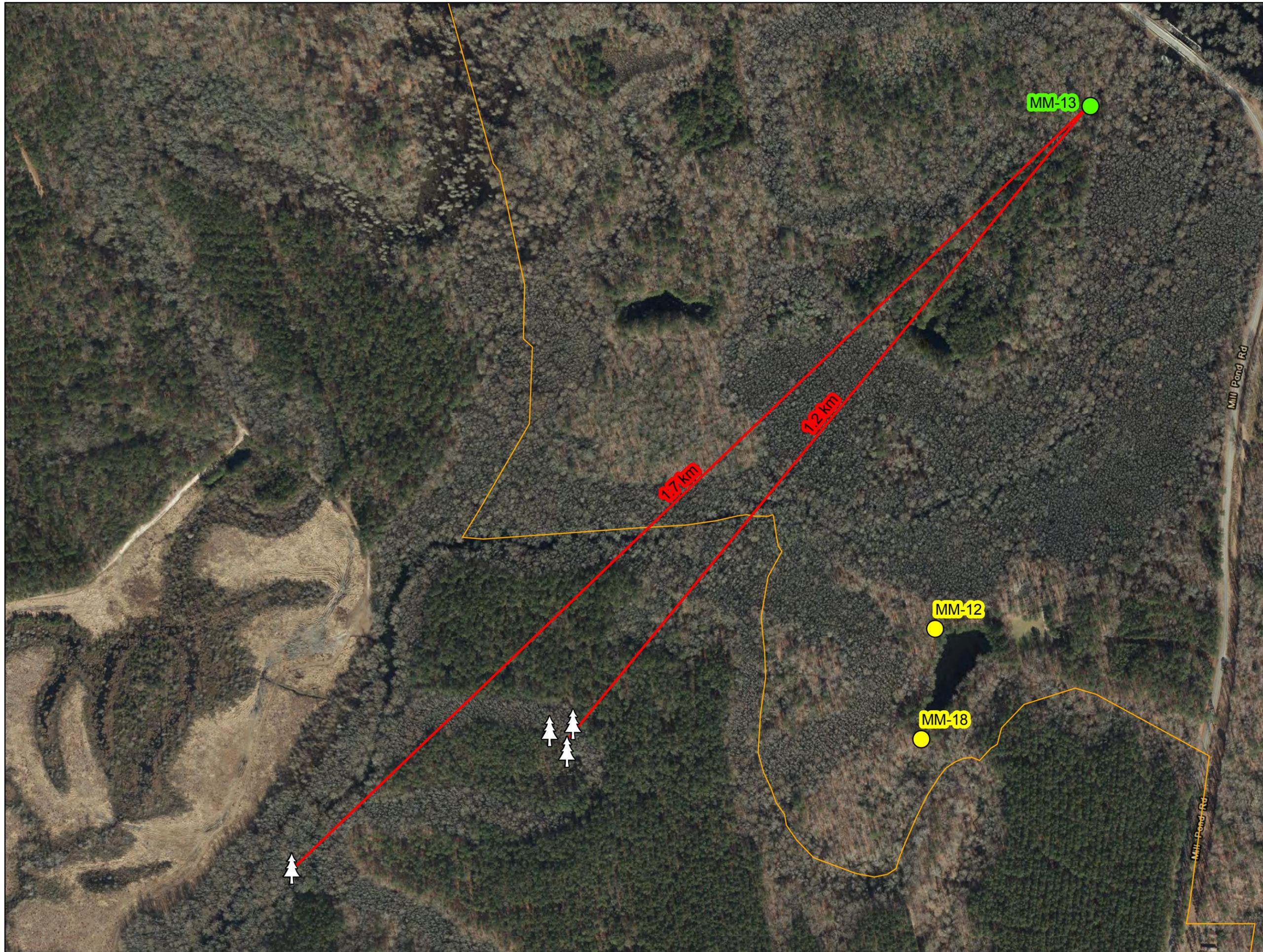
FIGURE 3b

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018
Merchants Millpond SP
MYSE Net Sites
(MM-13, MM-19)
Gates County, NC
 Map Date: 4/11/2018



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 World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Netting Locations

- Net Sites
- MYSE Capture Site

Roost Trees

- M144 Roost Tree

— Roost Tree Distances

Merchants Mill Pond SP

FIGURE 3c

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018

Merchants Millpond SP
M 144
Roost Tree Overview
Gates County, NC
 Map Date: 4/11/2018

N

GRAPHIC SCALE
 0 50 100 150 200
 Meters

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 Aerial Photography: NC Center for Geographic Information Analysis
 World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Roost Trees

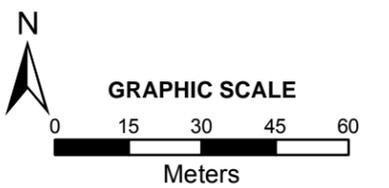
 M144 Roost Tree

FIGURE 3d

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

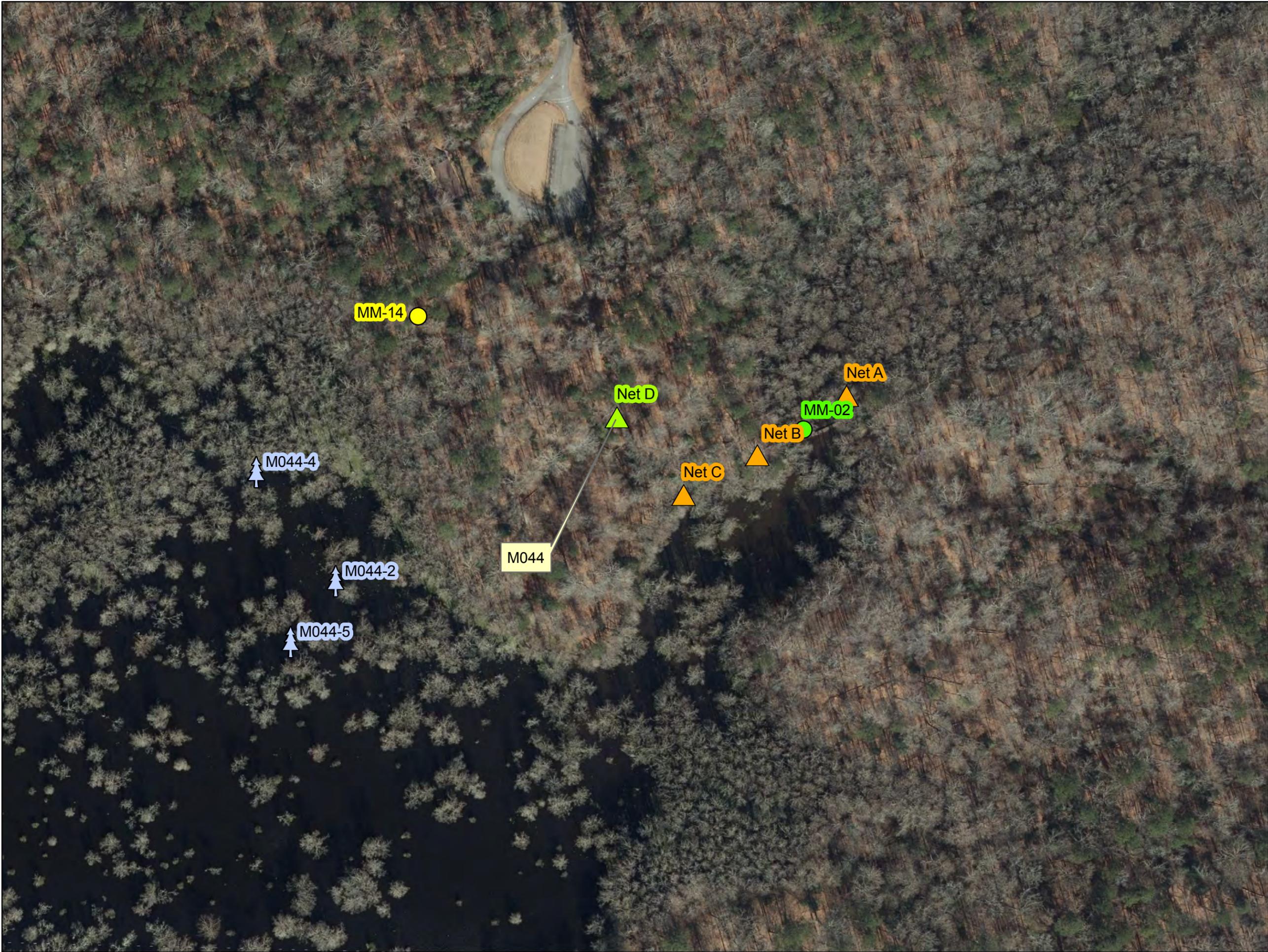
**Merchants Millpond SP
M 144
Roost Trees
Gates County, NC**

Map Date: 4/11/2018



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World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Netting Locations

- Net Sites
- MYSE Capture Site

Nets

- ▲ Net Locations
- ▲ MYSE Capture Net

Roost Trees

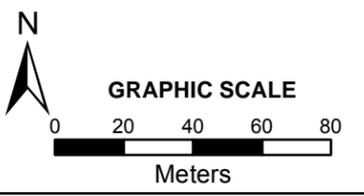
- ▲ M044 Roost Trees

FIGURE 3e

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

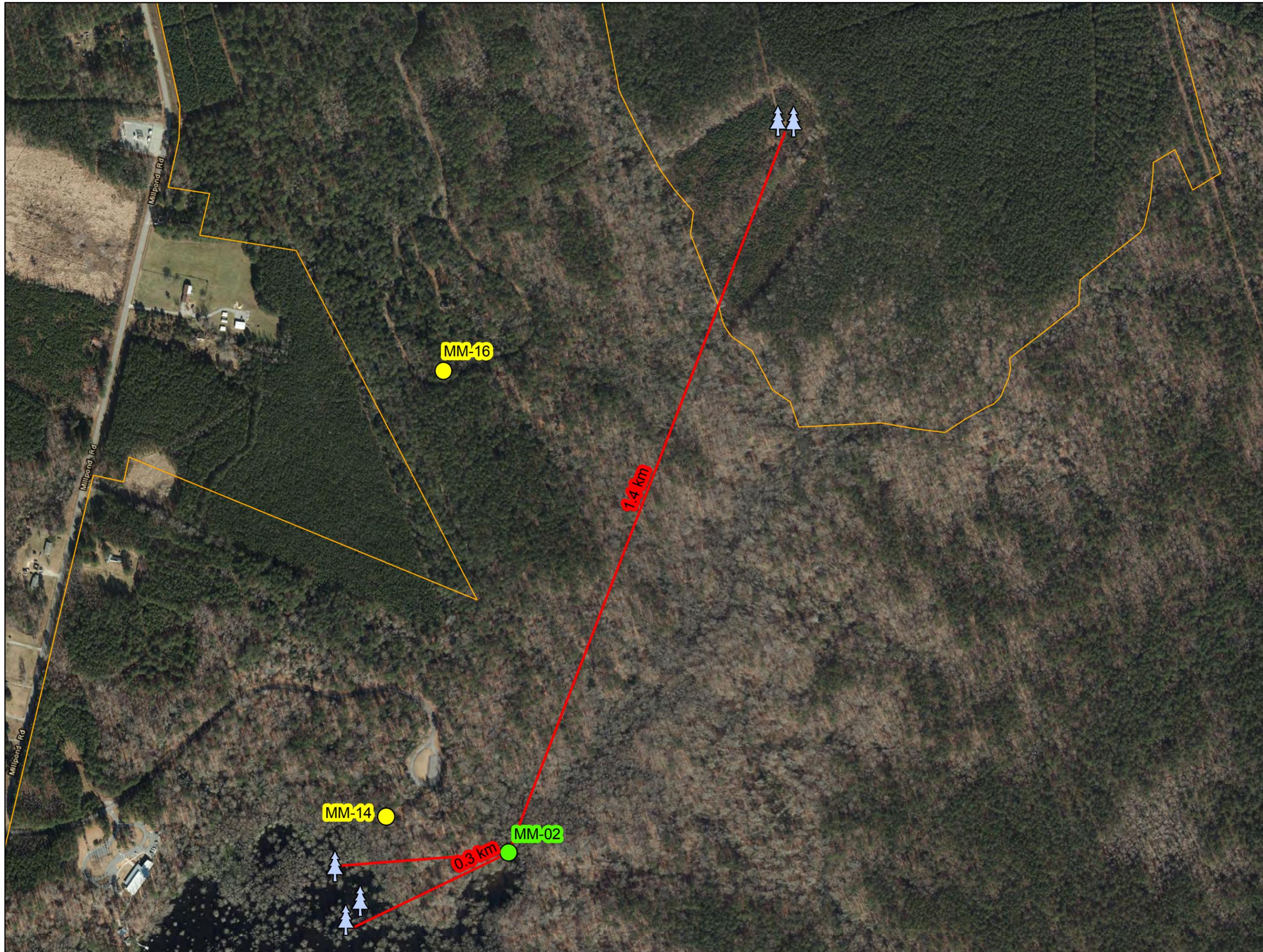
**Merchants Millpond SP
MYSE Net Site
(MM-02)
Gates County, NC**

Map Date: 4/11/2018



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Legend

Netting Locations

- Net Sites
- MYSE Capture Site

Roost Trees

- M044 Roost Trees

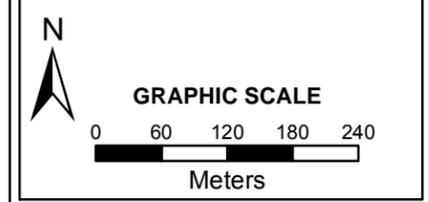
— Roost Tree Distances

Merchants Mill Pond SP

FIGURE 3f

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018

Merchants Millpond SP
M044
Roost Tree Overview
Gates County, NC
 Map Date: 4/11/2018



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 World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Netting Locations

- Net Sites

Roost Trees

- 🌲 M044 Roost Trees

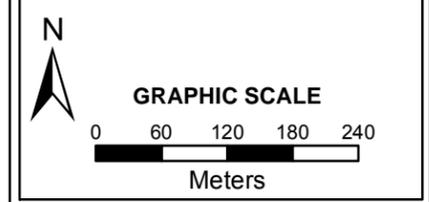
▭ Merchants Mill Pond SP

FIGURE 3g

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018

Merchants Millpond SP
M044
Roost Trees
Gates County, NC

Map Date: 4/11/2018



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World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

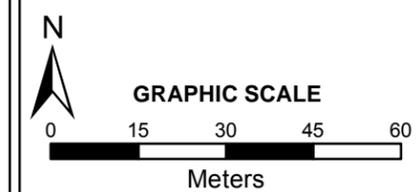
- MYSE Capture Site
- Nets**
- ▲ Net Locations
- ▲ MYSE Capture Net
- Merchants Mill Pond SP

FIGURE 3h

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

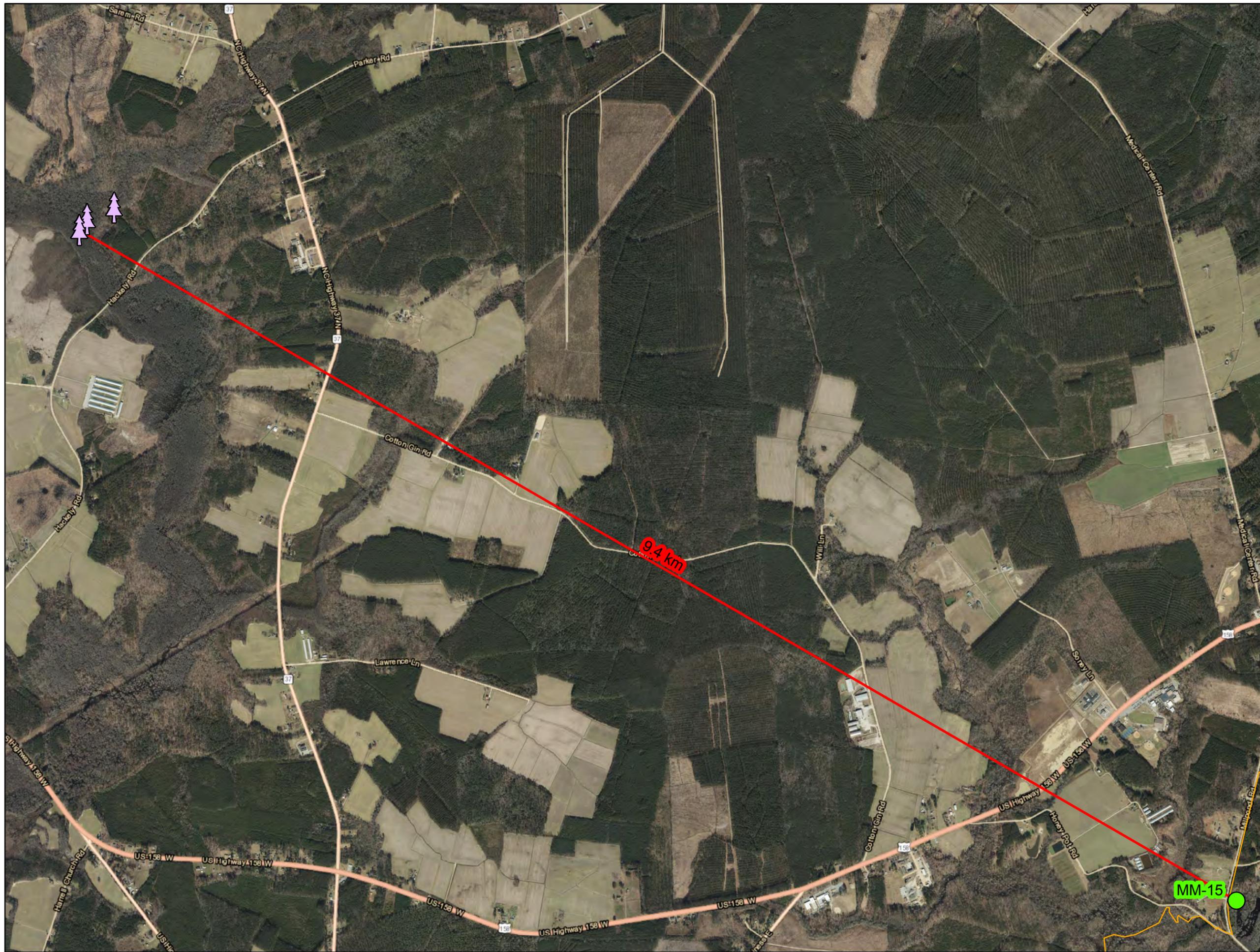
**Merchants Millpond SP
MYSE Net Site
(MM-15)
Gates County, NC**

Map Date: 4/11/2018



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World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

- MYSE Capture Site
- Roost Trees**
- 🌲 M184 Roost Trees
- Roost Tree Distances
- Merchants Mill Pond SP

FIGURE 3i

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018

Merchants Millpond SP
M184
Roost Tree Overview
Gates County, NC

Map Date: 4/11/2018

N

GRAPHIC SCALE

0 0.25 0.5 0.75 1

Kilometers

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 World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Roost Trees

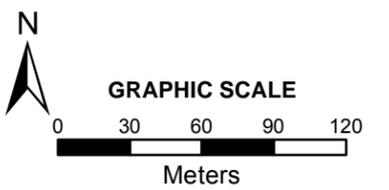
 M184 Roost Trees

FIGURE 3j

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

**Merchants Millpond SP
M184
Roost Trees
Gates County, NC**

Map Date: 4/11/2018



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World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

Netting Locations

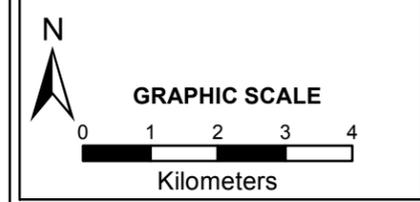
- Net Sites
- MYSE Capture Site
- North River GL
- County Boundaries

FIGURE 4a

NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018

North River GL
Overview
Camden & Currituck
Counties, NC

Map Date: 4/11/2018



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Legend

 MYSE Capture Site

NR-04

 Net Locations

 MYSE Capture Net

NR-05

 Net Locations

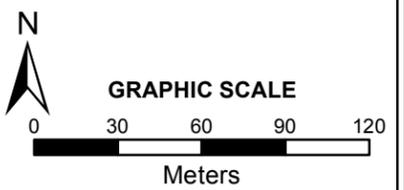
 MYSE Capture Net

FIGURE 4b

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

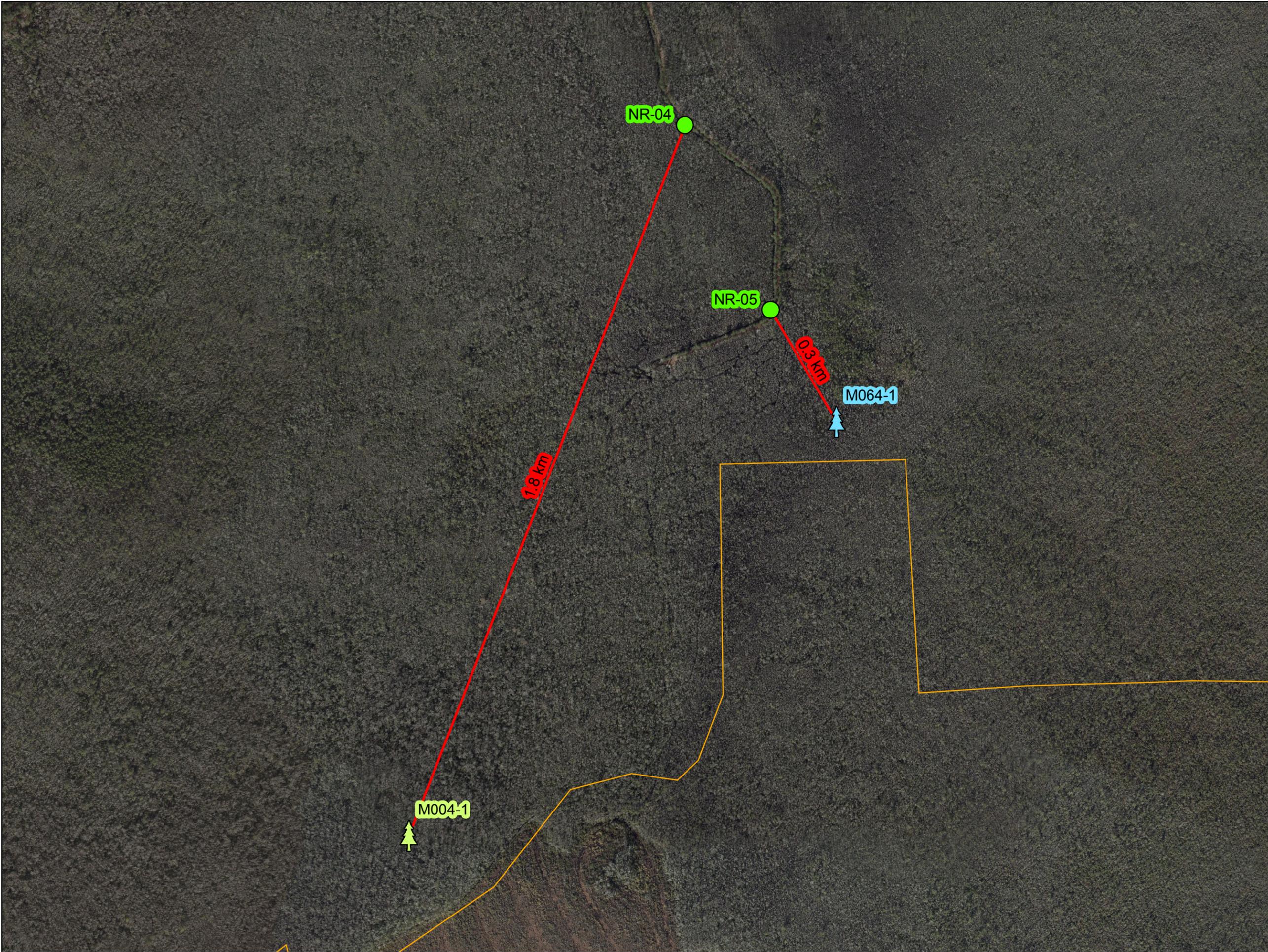
**North River GL
MYSE Net Sites
(NR-04, NR-05)
Camden County, NC**

Map Date: 4/11/2018



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Aerial Photography: NC Center for Geographic Information Analysis
World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors



Legend

 MYSE Capture Site

Roost Trees

 M004 Roost Tree

 M064 Roost Tree

 Roost Tree Distances

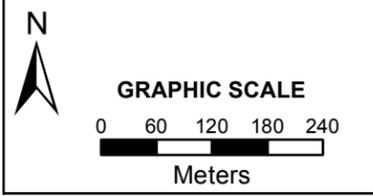
 North River GL

FIGURE 4c

**NCDOT
Eastern North Carolina
MYSE Research Study
Fall/Winter 2017/2018**

**North River GL
M004, M064
Roost Trees
Camden County, NC**

Map Date: 4/11/2018



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World Transportation: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

APPENDICES

Appendix A

NCDOT Mist-Netting and Acoustic Survey Data Forms

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Gates	Site#:	MM-13	Night#:	1	Site Name:	MM-Bennetts Creek Trail	Date:	11-16-17	
Latitude:			36.431409			Longitude:			-76.700728			
Datum:			NAD83			Elevation:			23'			
ID By:			Dylan Brooks			Observers:			Brandon Bradley , John Manuel			
Start Time:			16:58			End Time:			21:58			
Conditions:	Time 16:58	Temp 55.5 °F	Wind 1	Clouds 0	Time 19:58	Temp 46 °F	Wind 0	Clouds 0	Time 21:58	Temp 44 °F	Wind 0	Clouds 0
Moon Effect:	Wan-Gib		Start:			Stop:			Land Use: Urban / Agriculture (Forest) / Water / (Wetland) / Barren (describe):			
									43 61			
NETS/TRAPS:	A:	1x2H-6m	B:	1x2H-9m	C:	1x2H-9m	D:	1x2H-6m	E:			
Pool size WxL	N/A		N/A		N/A		N/A					
Swoop WxL	N/A		N/A		N/A		N/A					
Photo? or #	Y		Y		Y		Y					
BD#	Latitude	Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
 												
 												
 												
 												
Site Description:												
Quercus michauxii, Quercus nigra, Liquidambar styraciflua,												
Taxodium distichum, Pinus taeda												
Remarks:												

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: NR-07	Night#: 1	Site Name: NR-Garringtons Island Trail				Date: 11-25-17				
Latitude: 36.30610		Longitude: -76.01725		Datum: NAD83		Elevation: 26'		ID By: Dylan Brooks				
Observers: John Manuel, Ed Corey				Start Time: 16:51				End Time: 21:51				
Conditions:	Time 16:51	Temp 56 °F	Wind 1	Clouds 25	Time 19:21	Temp 52 °F	Wind 0	Clouds 25	Time 21:51	Temp 50 °F	Wind 0	Clouds 0
Moon Effect: Wax-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):								
		Stop:						43 61				
NETS/TRAPS:	A: 1x2H-4m	B: 1x2H-6m	C: 1x2H-6m	D: 1x2H-6m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A	N/A							
Swoop WxL	N/A	N/A	N/A	N/A	N/A							
Photo? or #	Y	Y	Y	Y	Y							
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	

Site Description:			<p> Agricultural land Young Forest Forest Road wetland Young forest opening Net D 4m Net C 6m Net B 15m Net A 6m Small trail </p>									
Pinus taeda, Quercus nigra, Liquidambar styraciflua,												
Acer rubrum												
Remarks:												

Bat Survey Data Form

Project: 17/18 Winter Research County: **Camden** Site# **NR-07** Night# **1** Site Name: **NR-Garringtons Island Trail** Date: **11-25-17**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Camden	Site#:	NR-01	Night#:	1	Site Name: NR-SW Forest Trail (Head)			Date: 11-27-17	
Latitude: 36.27977		Longitude: -75.998350				Datum:	NAD83	Elevation:	26'	ID By: Dylan Brooks		
Observers: Brandon Bradley , John Manuel , Jennifer Harrod							Start Time: 16:51			End Time: 18:51		
Conditions:	Time 16:51	Temp 53 °F	Wind 0	Clouds 0	Time -	Temp -	Wind -	Clouds -	Time 18:51	Temp 45 °F	Wind 0	Clouds 0
Moon Effect: Wax-Gib		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):								
		Stop:		43 61								
NETS/TRAPS:	A: 1x2H-6m	B: 1x2H-9m	C: 1x2H-6m	D: 1x2H-6m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A	N/A							
Swoop WxL	N/A	N/A	N/A	N/A	N/A							
Photo? or #	Y	Y	Y	Y	Y							
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
Site Description:												
Pinus taeda, Liquidambar styraciflua, Quercus nigra,												
Acer rubrum												
Remarks:			<p style="text-align: center;">Site sketch (label to match Nets/Traps and BD# above)</p>									
Cold out at 18:51												

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **NR-01** Night# **1** Site Name: **NR-SW Forest Trail (Head)** Date: **11-27-17**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Camden	Site#:	NR-05	Night#:	1	Site Name: NR-SW Forest Trail (End)			Date: 11-28-17	
Latitude: 36.27222		Longitude: -75.98704				Datum: NAD83	Elevation: 26'	ID By: Dylan Brooks				
Observers: Brandon Bradley , Jennifer Harrod , John Manuel						Start Time: 16:50			End Time: 21:50			
Conditions:	Time 16:50	Temp 58 °F	Wind 0	Clouds 0	Time 19:20	Temp 49.5 °F	Wind 0	Clouds 25	Time 21:50	Temp 47 °F	Wind 0	Clouds 25
Moon Effect: Wax-Gib		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe): 43 61								
NETS/TRAPS:	A: 1X2H-6m	B: 1x2H-6m	C: 1x2H-6m	D: 1x2H-6m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
Site Description:												
Pinus taeda, Liquidambar styraciflua, Acer rubrum,												
Taxodium distichum, Nyssa aquatica												
Remarks:												

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Gates	Site#:	MM-02	Night#:	1	Site Name: MM-Lassiter Trail Cypress Pond				Date:	12/2/2017						
Latitude:			36.436850			Longitude:			-76.692960			Datum:	NAD83	Elevation:	6'	ID By:	Kathryn Cunningham		
Observers:								John Manuel , Dominique DiLandro				Start Time:		16:45		End Time:		21:00	
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds							
	17:00	55 °F	0	100	19:30	52 °F	0	100	21:40	47 °F	0	100							
Moon Effect:		Wax-Gib		Start:									Land Use:	Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):					
				Stop:										43 61					
NETS/TRAPS:	A:	1x2H-18m		B:	1x2H-2.6m		C:	1x2H-6m		D:	1x2H-2.6m		E:			F:			
Pool size WxL	17m x 25m		N/A		N/A		N/A		N/A										
Swoop WxL	17m x 25m		N/A		N/A		N/A		N/A										
Photo? or #	Y		Y		Y		Y		Y										
BD#	Latitude		Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?						

Site Description:																			
Taxodium distichum, Fagus grandifolia, Ilex opaca, Pinus taeda,																			
Quercus michauxii, Quercus nigra, Oxydendron arboreum,																			
Arundinaria gigantea																			
Remarks:																			

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **NR-12** Night# **1** Site Name: **NR-Impoundment 1** Date: **1/9/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: NR-12	Night#: 2	Site Name: NR-Impoundment 1			Date: 1/10/2018					
Latitude: 36.284820		Longitude: -75.984440		Datum: NAD83	Elevation: 29'	ID By: Dylan Brooks						
Observers: N/A				Start Time: 17:09			End Time: 22:09					
Conditions:	Time 17:09	Temp 48 °F	Wind 1	Clouds 25	Time 19:39	Temp 42 °F	Wind 0	Clouds 0	Time 22:09	Temp 40.5 °F	Wind 0	Clouds 0
Moon Effect: Wan-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):								
		Stop:		43 61								
NETS/TRAPS:	A: 1x2H-6m	B: 1x2H-9m	C: 1x2H-12m	D: 1x2H-9m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
 												
Site Description:				<p>A hand-drawn site map showing the layout of the survey area. It features several tree symbols representing a forest. A large area on the right is labeled 'Impoundment'. A 'Forest edge' is marked with a line of trees. Two nets are labeled 'Net A' and 'Net B', both with a height of '9m'. A 'Trail' is indicated with an arrow. Other labels include 'Mature mixed Forest', 'Mature Forest', and '12m Net'.</p>								
Pinus taeda, Acer rubrum, Liquidambar styraciflua												
Remarks:												

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **NR-12** Night# **2** Site Name: **NR-Impoundment 1** Date: **1/10/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Camden	Site#:	NR-05	Night#:	2	Site Name: NR-Southwest Forest Trail 5			Date:	1/11/2018
Latitude: 36.27222		Longitude: -75.98704				Datum: NAD83		Elevation: 26'		ID By: Dylan Brooks		
Observers: Brandon Bradley						Start Time: 17:09			End Time: 22:09			
Conditions:	Time 17:09	Temp 60 °F	Wind 1	Clouds 75	Time 19:39	Temp 49.5 °F	Wind 1	Clouds 75	Time 22:09	Temp 47 °F	Wind 1	Clouds 1
Moon Effect: Wan-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):								
		Stop:		43 61								
NETS/TRAPS:	A: 1x2H-6m	B: 1x2H-6m	C: 1x2H-6m	D: 1x2H-6m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
Site Description:												
Liquidamba styraciflua, Acer rubrum, Pinus taeda,												
Nyssa aquatica, Taxodium distichum												
Remarks:												

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Currituck	Site#: NR-11	Night#: 1	Site Name: NR-Swamp Lane	Date: 1/11/2018
Latitude: 36.36847		Longitude: -75.99599		Datum: NAD83	Elevation: 3'
Observers: John Manuel				Start Time: 17:05	End Time: 22:05

Conditions:	Time 17:00	Temp 58 °F	Wind 0	Clouds 1	Time 19:30	Temp 56 °F	Wind 0	Clouds 1	Time 22:05	Temp 54 °F	Wind 1	Clouds 0.5
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Moon Effect: Wan-Cres	Start:	Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):
	Stop:	43 61

NETS/TRAPS:	A: 1x3H-9m	B: 1x3H-9m	C: 1x2H-12m	D: 1x2H-4m	E:	F:
Pool size WxL	N/A	N/A	N/A	N/A		
Swoop WxL	N/A	N/A	N/A	N/A		
Photo? or #	Y	Y	Y	Y		

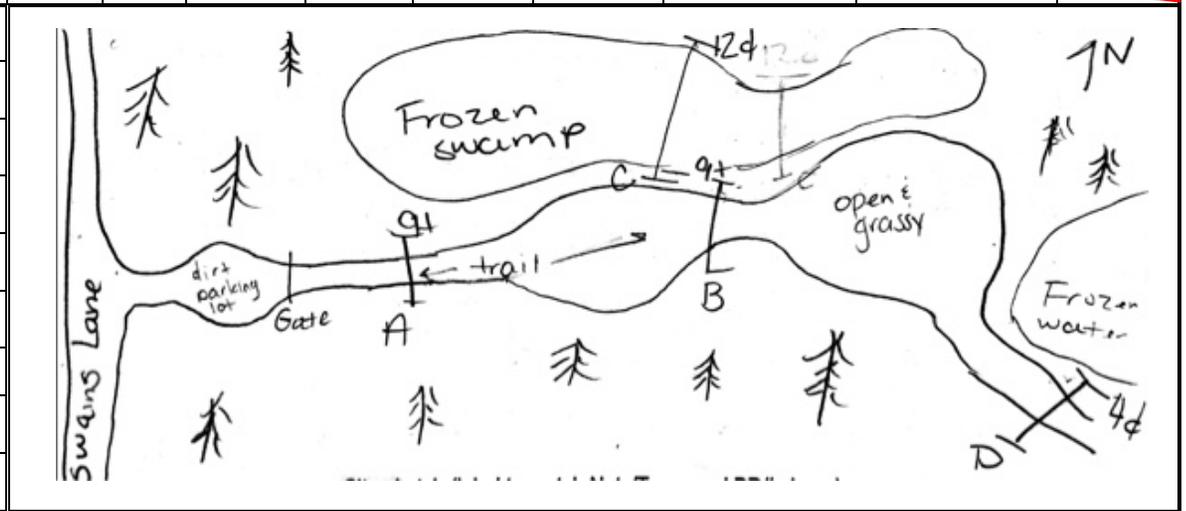
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?

Site Description:

Acer rubrum, Liriodendron tulipifera, Pinus taeda,
giant cane, Quercus nigra

Remarks:

Water is still frozen



Bat Survey Data Form

Project: **17/18 Winter Research** County: **Gates** Site# **MM-18** Night# **1** Site Name: **MM-Campground Pond Trail 1** Date: **1/12/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Gates	Site#: MM-14	Night#: 1	Site Name: MM-Pavilion				Date: 1/12/2018					
Latitude: 36.43733		Longitude: -76.694995		Datum: NAD83		Elevation: 24'		ID By: Kathryn Cunningham					
Observers: John Manuel				Start Time: 17:45				End Time: 19:30					
Conditions:	Time 17:30	Temp 68 °F	Wind 1	Clouds 1	Time 19:15	Temp 66 °F	Wind 2	Clouds 1	Time N/A	Temp N/A	Wind N/A	Clouds N/A	
Moon Effect: Wan-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / <u>Water</u> / Wetland / Barren (describe):									
		Stop:											
NETS/TRAPS:		A: 1x3H-6m		B: 1x2H-4m		C: 1x2H-4m		D: 1x3H-6m		E: 1x2H-2.6m		F: 1x2H-2.6m	
Pool size WxL		N/A		N/A		N/A		N/A		N/A		N/A	
Swoop WxL		N/A		N/A		N/A		N/A		N/A		N/A	
Photo? or #		Y		Y		Y		Y		Y		Y	
BD#	Latitude	Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 													
 													
 													
 													
Site Description:				<p>A hand-drawn site map showing a pond on the right side. A pavilion is located on the left. Six mist-net locations are marked with letters A through F. Location A is a 6m net, B is a 4m net, C is a 4m net, D is a 6m net, E is a 2.6m net, and F is a 2.6m net. A north arrow is drawn on the left side of the map.</p>									
Fagus grandifolia, chestnut oak, bald cypress													
Remarks:				<p>Rain from 16:00 to 17:45. Closed nets at 19:30 from rain/wind.</p> <p>Net F is same as Net D from MM-02.</p>									

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Gates** Site# **MM-14** Night# **1** Site Name: **MM-Pavilion** Date: **1/12/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research		County:	Currituck	Site#:	NR-11	Night#:	2	Site Name: NR-Swamp Lane			Date:	1/20/2018
Latitude: 36.368470			Longitude: -75.99599			Datum: NAD83		Elevation: 3'		ID By: Dylan Brooks			
Observers: John Manuel						Start Time: 17:19			End Time: 22:19				
Conditions:	Time 17:19	Temp 51 °F	Wind 2	Clouds 0	Time 19:39	Temp 42 °F	Wind 1	Clouds 0	Time 22:19	Temp 40.5 °F	Wind 0	Clouds 0	
Moon Effect: Wax-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):									
		Stop:		43 61									
NETS/TRAPS:	A: 1x3H-9m	B: 1x3H-12m	C: 1x2H-6m	D: 1x2H-9m	E:	F:							
Pool size WxL	N/A	N/A	N/A	9m x 20m									
Swoop WxL	N/A	N/A	N/A	N/A									
Photo? or #	Y	Y	Y	Y									
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?		
 													
 													
 													
 													
Site Description:													
Pinus taeda, Liquidambar styraciflua, Quercus nigra,													
Acer rubrum, Liriodendron tulipifera													
Remarks:													

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Currituck** Site# **NR-11** Night# **2** Site Name: **NR-Swamp Lane** Date: **1/20/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: NR-12	Night#: 3	Site Name: NR-Impoundment 1			Date: 1/21/2018					
Latitude: 36.28543		Longitude: -75.98398		Datum: NAD83		Elevation: 26'		ID By: Dylan Brooks				
Observers: Ed Corey				Start Time: 17:20			End Time: 22:50					
Conditions:	Time 17:20	Temp 56 °F	Wind 0	Clouds 0	Time 19:50	Temp 50 °F	Wind 1	Clouds 0	Time 22:50	Temp 45 °F	Wind 0	Clouds 0
Moon Effect: Wax-Cres		Start:		Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe):								
		Stop:		43 61								
NETS/TRAPS:	A: 1x3H-9m	B: 1x2H-9m	C: 1x3H-12m	D: 1x2H-6m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
Site Description:												
Pinus taeda, Acer rubrum, Liquidambar styraciflua												
Remarks:												

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: NR-02	Night#: 1	Site Name: NR-Southwest Forest Trail 2				Date: 1/21/2018				
Latitude: 36.27930		Longitude: -75.99362		Datum: NAD83		Elevation: 26'		ID By: Kathryn Cunningham				
Observers: Dominique DiLandro				Start Time: 17:05				End Time: 22:05				
Conditions:	Time 17:15	Temp 52 °F	Wind 0	Clouds 0	Time 20:30	Temp 49 °F	Wind 0	Clouds 0	Time 22:00	Temp 46 °F	Wind 0	Clouds 0
Moon Effect: Wax-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):								
		Stop:		43				61				
NETS/TRAPS:	A: 1x3H-6m	B: 1x2H-6m	C: 1x2H-4m	D: 1x2H-6m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
 												
Site Description:												
Pinus taeda, Quercus nigra, Acer rubrum												
Remarks:												

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: DS-09	Night#: 1	Site Name: DS-Dam 1				Date: 1/22/2018				
Latitude: 36.54794		Longitude: -76.38375		Datum: NAD83		Elevation: 18'		ID By: Dylan Brooks				
Observers: Brandon Bradley, John Manuel				Start Time: 17:22				End Time: 22:22				
Conditions:	Time 17:22	Temp 58 °F	Wind 1	Clouds 50	Time 19:52	Temp 54 °F	Wind 1	Clouds 50	Time 22:22	Temp 52 °F	Wind 1	Clouds 25
Moon Effect: Wax-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):								
		Stop:		43 61								
NETS/TRAPS:	A: 1x3H-9m	B: 1x3H-12m	C: 1x2H-9m	D: 1x2H-9m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
 												
Site Description:			<p>Hand-drawn site map showing a canal, wetland, mature mixed forest, and four mist-net locations (A, B, C, D) with their respective heights and a trail.</p>									
Pinus serotina, Quercus nigra, Quercus rubra, Acer rubrum												
Magnolia virginiana												
Remarks:												

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **DS-09** Night# **1** Site Name: **DS-Dam 1** Date: **1/22/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: DS-14	Night#: 1	Site Name: DS-Boardwalk	Date: 1/22/2018							
Latitude: 36.504315		Longitude: -76.357215		Datum: NAD83	Elevation: 15'							
Observers: Dominique DiLandro , Mack Des Champs				Start Time: 17:15	End Time: 22:15							
Conditions:	Time 17:30	Temp 54 °F	Wind 0	Clouds 0	Time 19:30	Temp 53 °F	Wind 0	Clouds 0	Time 22:00	Temp 50 °F	Wind 0	Clouds 0

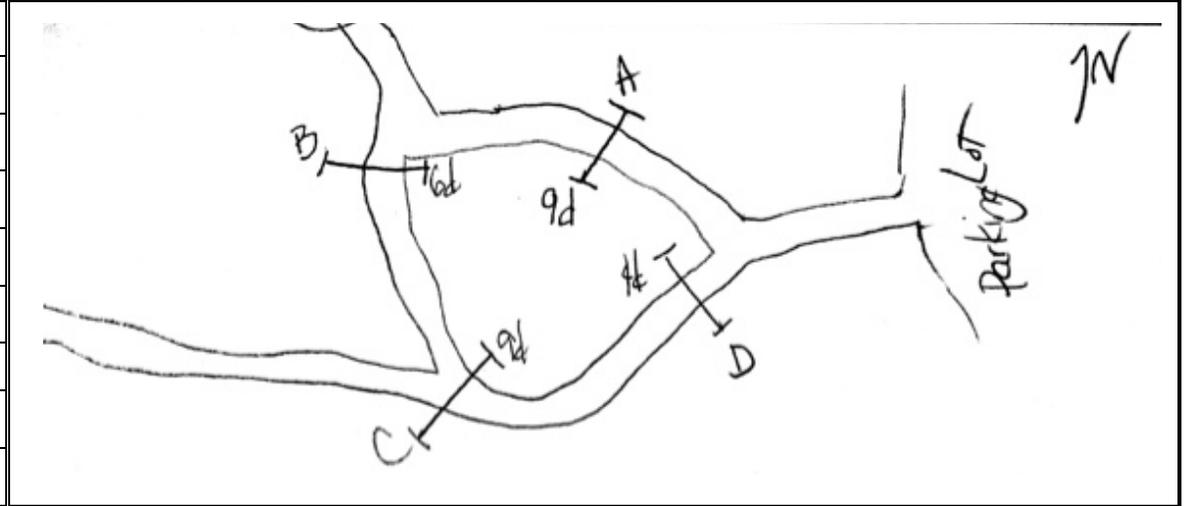
Moon Effect: Wax-Cres	Start:	Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):
	Stop:	43 61

NETS/TRAPS:	A: 1x2H-9m	B: 1x2H-6m	C: 1x2H-9m	D: 1x2H-4m	E:	F:
Pool size WxL	N/A	N/A	N/A	N/A		
Swoop WxL	N/A	N/A	N/A	N/A		
Photo? or #	Y	Y	Y	Y		

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?

Site Description:
Quercus nigra, Acer rubrum, Taxodium distichum

Remarks:



Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **DS-14** Night# **1** Site Name: **DS-Boardwalk** Date: **1/22/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: 17/18 Winter Research	County: Camden	Site#: DS-05	Night#: 2	Site Name: DS-Martha Washington 2				Date: 2/1/2018				
Latitude: 36.53743		Longitude: -76.37275		Datum: NAD83	Elevation: 18'	ID By: Dylan Brooks						
Observers: Brandon Bradley, Ed Corey, John Manuel				Start Time: 17:31			End Time: 22:31					
Conditions:	Time 17:31	Temp 59 °F	Wind 5	Clouds 50	Time 20:01	Temp 54 °F	Wind 4	Clouds 75	Time 22:31	Temp 50 °F	Wind 3	Clouds 25
Moon Effect: Wan-Gib	Start:	Land Use: Urban / Agriculture / <u>Forest</u> / <u>Water</u> / <u>Wetland</u> / Barren (describe):										
	Stop:	43 51 61										
NETS/TRAPS:	A: 1x2H-6m	B: 1x2H-9m	C: 1x2H-12m	D: 1x3H-9m	E: 1x2H-6m	F: 1x2H-6m						
Pool size WxL	N/A	N/A	N/A	N/A	N/A	N/A						
Swoop WxL	N/A	N/A	N/A	N/A	N/A	N/A						
Photo? or #	Y	N/A	Y	Y	Y	Y						
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
(This section is crossed out with a red line)												
Site Description:			<p>Laurel Ditch Road</p> <p>Mature Mixed Forest</p> <p>Wetland</p> <p>Canal</p> <p>Martha Washington Trail</p> <p>Net D</p> <p>Net E</p> <p>Net C</p> <p>Net B</p> <p>Net A</p> <p>Kim Saunders Road</p> <p>Mature Mixed Forest</p>									
Platanus occidentalis, Pinus serotina, Quercus nigra												
Remarks:												

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **DS-05** Night# **2** Site Name: **DS-Martha Washington 2** Date: **2/1/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Camden** Site# **DS-15** Night# **1** Site Name: **DS-South Trail** Date: **2/1/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Gates	Site#:	MM-13	Night#:	2	Site Name:	MM-Bennett's Creek Trail 1	Date :	2/6/2018							
Latitude:		36.431409		Longitude:		-76.700728		Datum:	NAD83	Elevation:	23'	ID By:	Dylan Brooks					
Observers:								Brandon Bradley , John Manuel		Start Time:		17:37		End Time:		22:37		
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds						
	17:37	54 °F	3	0.75	20:07	49 °F	4	0.25	22:37	44 °F	3	0						
Moon Effect:		Wan-Gib		Start:				Stop:				Land Use:		Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):				
														43 61				
NETS/TRAPS:	A:	1x2H-6m		B:	1x3H-9m		C:	1x2H-9m		D:	1x2H-9m		E:	1x3H-12m		F:		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		N/A					
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		N/A					
Photo? or #	Y		Y		Y		Y		Y		Y		Y					
BD#	Latitude		Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?					
Site Description:																		
Quercus michauxii																		
Quercus nigra																		
Liquidambar styraciflua																		
Taxodium distichum																		
Pinus taeda																		
Remarks:																		

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Gates	Site#:	MM-12	Night#:	1	Site Name: MM-Campground			Date: 2/6/2018	
Latitude: 36.42562		Longitude: -76.70287				Datum:	NAD83	Elevation:	25'	ID By: Kathryn Cunningham		
Observers: Blake Ellett						Start Time: 17:35			End Time: 22:35			
Conditions:	Time 17:30	Temp 55 °F	Wind 0	Clouds 50	Time 20:00	Temp 46 °F	Wind 0	Clouds 0	Time 22:30	Temp 42 °F	Wind 0	Clouds 0
Moon Effect: Wan-Gib		Start:		Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe):								
		Stop:		41 52								
NETS/TRAPS:	A: 1x3H-9m	B: 1x3H-9m	C: 1x2H-6m	D: 1x2H-4m	E:	F:						
Pool size WxL	N/A	N/A	N/A	N/A								
Swoop WxL	N/A	N/A	N/A	N/A								
Photo? or #	Y	Y	Y	Y								
BD#	Latitude	Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?

Site Description:				<p>A hand-drawn site map showing a pond on the left side. A horizontal line represents a path or boundary. Along this line, there are several points marked: 'C' at the top left, 'D' at the bottom left, 'A' in the middle, and '9+' at the top right. A vertical line segment labeled 'B' extends downwards from the '9+' point. A north arrow is drawn on the right side of the map, pointing upwards.</p>								
Fagus grandifolia, Carpinus caroliniana, Pinus taeda,												
wax myrtle, Christmas fern, Ilex opaca, Quercus nigra,												
Acer rubrum												
Remarks:												

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Gates** Site# **MM-12** Night# **1** Site Name: **MM-Campground** Date: **2/6/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Gates** Site# **MM-10** Night# **1** Site Name: **MM-Fire Road Boardwalk** Date: **2/9/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Gates	Site#:	MM-03	Night#:	1	Site Name: MM-Fire Road 1			Date: 2/9/2018	
Latitude: 36.448718			Longitude: -76.681056			Datum: NAD83		Elevation: 44'		ID By: Kathryn Cunningham		
Observers: Jennifer Harrod, John Manuel						Start Time: 17:30			End Time: 21:45			
Conditions:	Time 17:30	Temp 52 °F	Wind 0	Clouds 25	Time 20:00	Temp 43 °F	Wind 0	Clouds 0	Time 21:45	Temp 37 °F	Wind 0	Clouds 0
Moon Effect: Wan-Cres		Start:		Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren (describe): 43								
NETS/TRAPS:	A: 1x3H-6m	B: 1x3H-9m	C: 1x3H-6m	D: 1x2H-9m	E: 1x2H-6m	F: 1x2H-6m						
Pool size WxL	N/A	N/A	N/A	N/A	N/A	N/A						
Swoop WxL	N/A	N/A	N/A	N/A	N/A	N/A						
Photo? or #	Y	Y	Y	Y	Y	Y						
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 												
 												
 												
 												
 												
Site Description:												
Pinus taeda, Pinus palustris, Ilex opaca, Liquidambar styraciflua												
Quercus stellata, Morella cerifera												
Remarks:												

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Gates** Site# **MM-03** Night# **1** Site Name: **MM-Fire Road 1** Date: **2/9/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

Bat Survey Data Form

Project: **17/18 Winter Research** County: **Gates** Site# **MM-14** Night# **2** Site Name: **MM-Pavilion** Date: **2/10/2018**

	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NO BATS

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	17/18 Winter Research	County:	Gates	Site#:	MM-15	Night#:	1	Site Name: MM-BCT Millpond 1			Date: 2/11/2018		
Latitude:	36.433850			Longitude:	-76.703669			Datum:	NAD83	Elevation:	21'	ID By:	Dylan Brooks
Observers:	Brandon Bradley						Start Time: 17:42			End Time: 22:42			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	
	17:42	74°F	4	1	20:12	71°F	4	1	22:42	69°F	3	75	
Moon Effect:	Wax-Cres			Start:				Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe):					
				Stop:				43 61					
NETS/TRAPS:	A:	1x2H-6m	B:	1x2H-4m	C:	1x2H-6m	D:	1x2H-4m	E:				
Pool size WxL	N/A		N/A		N/A		N/A						
Swoop WxL	N/A		N/A		N/A		N/A						
Photo? or #	Y		Y		Y		Y						
BD#	Latitude	Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
 													
 													
 													
 													
Site Description:													
Taxodium ascendens, Pinus taeda, Fagus grandifolia,													
Ilex opaca, Acer rubrum													
Remarks:													

Appendix B

Mist-Net Site Photographs

Merchants Millpond State Park - Bennett's Creek Trail 11/16/2017

MYSE (Frequency #: 150.104) caught in Net A & MYSE (Frequency #: 150.144) caught in Net B

Photo 1: Site MM-13, Night 1, Net A



Photo 2: Site MM-13, Night 1, Net B



Photo 3: Site MM-13, Night 1, Net C



Photo 4: Site MM-13, Night 1, Net D



North River Game Land: Garringtons Island Trail 11/25/2017

Photo 1: Site NR-07, Night 1, Net A



Photo 2: Site NR-07, Night 1, Net B



Photo 3: Site NR-07, Night 1, Net C



Photo 4: Site NR-07, Night 1, Net D



North River Game Land: SW Forest Trail (Head) 11/27/2017

Photo 1: Site NR-01, Night 1, Net A



Photo 2: Site NR-01, Night 1, Net B



Photo 3: Site NR-01, Night 1, Net C



Photo 4: Site NR-01, Night 1, Net D



North River Game Land: SW Forest Trail (End) 11/28/2017

MYSE (Frequency #: 150.064) caught in Net C

Photo 1: Site NR-05, Night 1, Net A



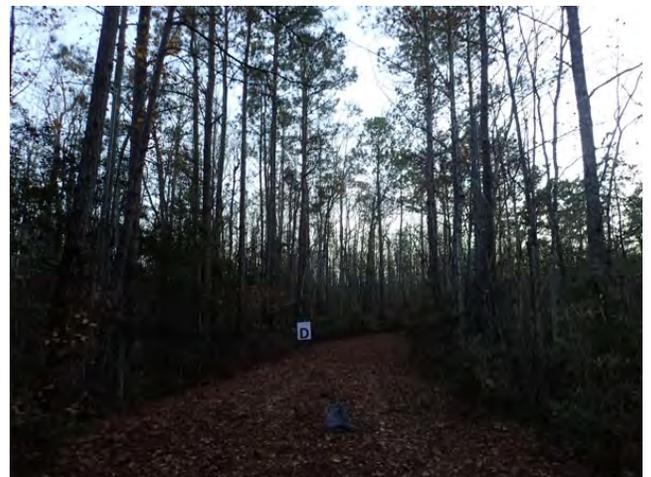
Photo 2: Site NR-05, Night 1, Net B



Photo 3: Site NR-05, Night 1, Net C



Photo 4: Site NR-05, Night 1, Net D



Merchants Millpond State Park: Lassiter Trail Cypress Pond 12/2/2017

MYSE (Frequency #: 150.044) caught in Net D

Photo 1: Site MM-02, Night 1, Net A



Photo 2: Site MM-02, Night 1, Net B



Photo 3: Site MM-02, Night 1, Net C



Photo 4: Site MM-02, Night 1, Net D



North River Game Land: Impoundment 1 1/10/2018

Photo 1: Site NR-12, Night 2, Net A



Photo 2: Site NR-12, Night 2, Net B



Photo 3: Site NR-12, Night 2, Net C



Photo 4: Site NR-12, Night 2, Net D



North River Game Land: SW Forest Trail (Head) 1/10/2018

Photo 1: Site NR-01, Night 2, Net A



Photo 2: Site NR-01, Night 2, Net B



Photo 3: Site NR-01, Night 2, Net C

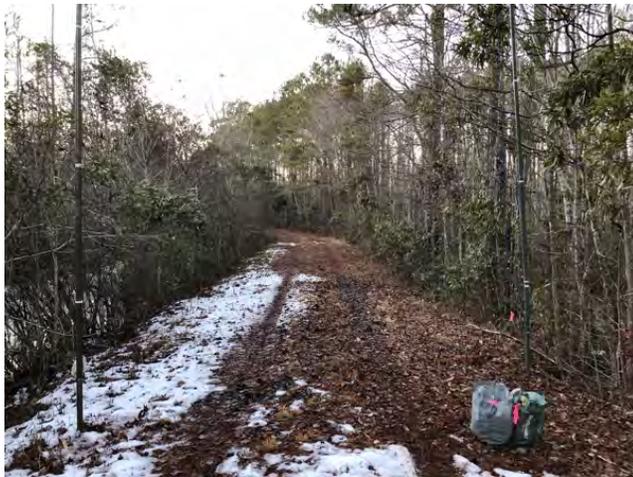


Photo 4: Site NR-05, Night 2, Net D



North River Game Land: SW Forest Trail (End) 1/11/2018

Photo 1: Site NR-05, Night 2, Net A



Photo 2: Site NR-05, Night 2, Net B



Photo 3: Site NR-05, Night 2, Net C



Photo 4: Site NR-05, Night 2, Net D



North River Game Land: Swamp Lane 1/11/2018

Photo 1: Site NR-11, Night 1, Net A



Photo 2: Site NR-11, Night 1, Net B



Photo 3: Site NR-11, Night 1, Net C



Photo 4: Site NR-11, Night 1, Net D



Merchants Millpond State Park: Campground Pond Trail 1 1/12/2018

Photo 1: Site MM-18, Night 1, Net A



Photo 2: Site MM-18, Night 1, Net B



Photo 3: Site MM-18, Night 1, Net C



Photo 4: Site MM-18, Night 1, Net D



Merchants Millpond State Park: Pavilion 1/12/2018

Photo 1: Site MM-14, Night 1, Net A



Photo 2: Site MM-14, Night 1, Net B



Photo 3: Site MM-14, Night 1, Net C



Photo 4: Site MM-14, Night 1, Net D



Photo 5: Site MM-14, Night 1, Net E



Photo 6: Site MM-14, Night 1, Net F



North River Game Land: Swamp Lane 1/20/2018

Photo 1: Site NR-11, Night 2, Net A



Photo 2: Site NR-11, Night 2, Net B



Photo 3: Site NR-11, Night 2, Net C



Photo 4: Site NR-11, Night 2, Net D



North River Game Land: Southwest Forest Trail 4 1/20/2018

MYSE (Frequency #: 150.004) caught in Net A

Photo 1: Site NR-04, Night 1, Net A



Photo 2: Site NR-04, Night 1, Net B



Photo 3: Site NR-04, Night 1, Net C



Photo 4: Site NR-04, Night 1, Net D



North River Game Land: Impoundment 1 1/21/2018

Photo 1: Site NR-12, Night 3, Net A



Photo 2: Site NR-12, Night 3, Net B



Photo 3: Site NR-12, Night 3, Net C



Photo 4: Site NR-12, Night 3, Net D



North River Game Land: Southwest Forest Trail 2 1/21/2018

Photo 1: Site NR-02, Night 1, Net A



Photo 2: Site NR-02, Night 1, Net B



Photo 3: Site NR-02, Night 1, Net C



Photo 4: Site NR-02, Night 1, Net D



Dismal Swamp State Park: Dam 1 1/22/2018

Photo 1: Site DS-09, Night 1, Net A



Photo 2: Site DS-09, Night 1, Net B



Photo 3: Site DS-09, Night 1, Net C



Photo 4: Site DS-09, Night 1, Net D



Dismal Swamp State Park: Boardwalk 1/22/2018

Photo 1: Site DS-14, Night 1, Net A



Photo 2: Site DS-14, Night 1, Net B



Photo 3: Site DS-14, Night 1, Net C



Photo 4: Site DS-14, Night 1, Net D



Dismal Swamp State Park: Martha Washington 2 1/23/2018

MYSE (Frequency #: 150.084) caught in Net D

Photo 1: Site DS-05, Night 1, Net A



Photo 2: Site DS-05, Night 1, Net B



Photo 3: Site DS-05, Night 1, Net C



Photo 4: Site DS-05, Night 1, Net D



Dismal Swamp State Park: Moonshine Distillery 1/23/2018

Photo 1: Site DS-01, Night 1, Net A



Photo 2: Site DS-01, Night 1, Net B



Photo 3: Site DS-01, Night 1, Net C



Photo 4: Site DS-01, Night 1, Net D



Dismal Swamp State Park: Martha Washington 2 2/1/2018

Photo 1: Site DS-05, Night 2, Net A

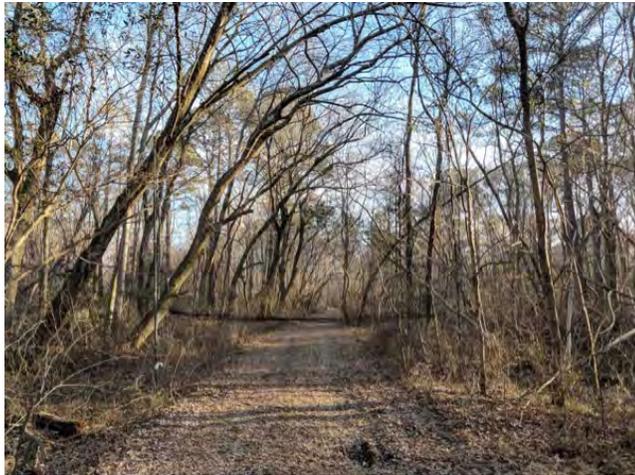


Photo 2: Site DS-05, Night 2, Net B



Photo 3: Site DS-05, Night 2, Net C



Photo 4: Site DS-05, Night 2, Net D



Photo 5: Site DS-05, Night 2, Net E



Photo 6: Site DS-05, Night 2, Net F



Dismal Swamp State Park: South Trail 2/1/2018

Photo 1: Site DS-15, Night 1, Net A



Photo 2: Site DS-15, Night 1, Net B



Photo 3: Site DS-15, Night 1, Net C



Photo 4: Site DS-15, Night 1, Net D



Photo 5: Site DS-15, Night 1, Net E



Merchants Millpond State Park: Bennett's Creek Trail 1 2/6/2018

Photo 1: Site MM-13, Night 2, Net A



Photo 2: Site MM-13, Night 2, Net B



Photo 3: Site MM-13, Night 2, Net C



Photo 4: Site MM-13, Night 2, Net D



Photo 5: Site MM-13, Night 2, Net E



Merchants Millpond State Park: Campground 2/6/2018

Photo 1: Site MM-12, Night 1, Net A



Photo 2: Site MM-12, Night 1, Net B



Photo 3: Site MM-12, Night 1, Net C



Photo 4: Site MM-12, Night 1, Net D



Merchants Millpond State Park: Fire Road Boardwalk 2/9/2018

Photo 1: Site MM-10, Night 1, Net A



Photo 2: Site MM-10, Night 1, Net B



Photo 3: Site MM-10, Night 1, Net C



Photo 4: Site MM-10, Night 1, Net D



Merchants Millpond State Park: Fire Road 1 2/9/2018

Photo 1: Site MM-03, Night 1, Net A



Photo 2: Site MM-03, Night 1, Net B



Photo 3: Site MM-03, Night 1, Net C



Photo 4: Site MM-03, Night 1, Net D



Photo 5: Site MM-03, Night 1, Net E



Photo 6: Site MM-03, Night 1, Net F



Merchants Millpond State Park: Roundabout Campground 1 2/10/2018

Photo 1: Site MM-16, Night 1, Net A



Photo 2: Site MM-16, Night 1, Net B



Photo 3: Site MM-16, Night 1, Net C

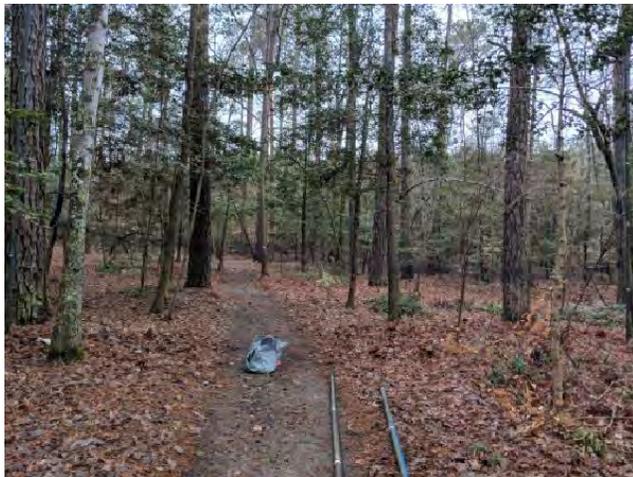


Photo 4: Site MM-16, Night 1, Net D



Merchants Millpond State Park: Pavilion 2/10/2018

Photo 1: Site MM-14, Night 2, Net A



Photo 2: Site MM-14, Night 2, Net B



Photo 3: Site MM-14, Night 2, Net C



Photo 4: Site MM-14, Night 2, Net D



Photo 5: Site MM-14, Night 2, Net E



Photo 6: Site MM-14, Night 2, Net F



Merchants Millpond State Park: BCT Millpond 1 2/11/2018

MYSE (Frequency #: 150.184) caught in Net A

Photo 1: Site MM-15, Night 1, Net A



Photo 2: Site MM-15, Night 1, Net B



Photo 3: Site MM-15, Night 1, Net C



Photo 4: Site MM-15, Night 1, Net D



Merchants Millpond State Park: Boat Ramp 2/11/2018

MYSE (Frequency #s: 150.164 / 150.204 / None) caught in Net A

Photo 1: Site MM-19, Night 1, Net A

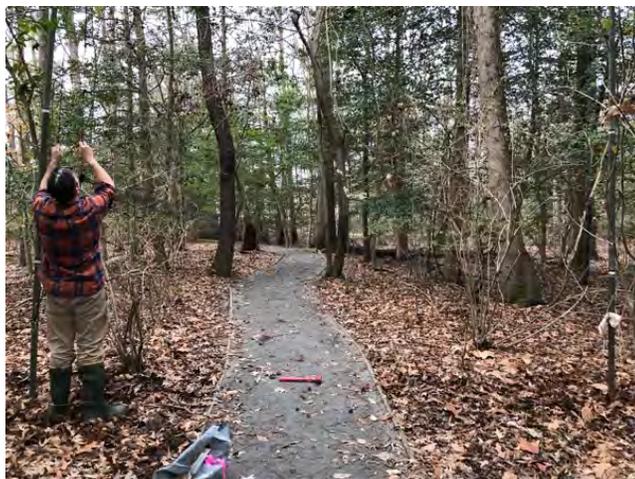


Photo 2: Site MM-19, Night 1, Net B



Photo 3: Site MM-19, Night 1, Net C



Photo 4: Site MM-19, Night 1, Net D



Photo 5: Site MM-19, Night 1, Net E



Appendix C

Representative Captured MYSE Photographs

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 11/16/2017. Band number: CALYX 0792. Frequency number: 150.104.



Lacking fur around eyes



Toe hairs



Transmitter



6m double high net at Merchants Millpond State Park

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 11/16/2017. Band number: CALYX 0751. Frequency number: 150.144.



Ear/tragus size and shape



Toe hairs



Transmitter



6m double high net at Merchants Millpond State Park

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at North River Game Land on 11/28/2017. Band number: CALYX 0441. Frequency number: 150.064.



Lacking fur around eyes



Ear/tragus size and shape



Transmitter



Toe hairs



6m double high net at North River Game Land

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 12/2/2017. Band number: CALYX 1001. Frequency number: 150.044.



Ears extend beyond nose



Slightly keeled calcar



Toe hairs



Transmitter



2.6m double high at North River Game Land

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at North River Game Land on 1/20/2018. Band number: CALYX 0356. Frequency number: 150.004.



Lacking fur around eyes



Ear/tragus size and shape



Transmitter



Toe hairs



6m triple high net at North River Game Land

Healthy adult non-reproductive female northern long-eared bat (*Myotis septentrionalis*) captured at Dismal Swamp State Park on 1/23/2018. Band number: CALYX 0402. Frequency number: 150.084.



Lacking fur around eyes



Ear/tragus size and shape



6m double high net at Dismal Swamp State Park

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 2/11/2018. Band number: CALYX 0411. Frequency number: 150.184.



Ear/tragus size and shape



Ear/tragus size and shape



6m double high net at Merchants Millpond State Park

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 2/11/2018. Band number: CALYX 0360. Frequency number: 150.164.



Lacking fur around eyes



Ear/tragus size and shape



Transmitter



Toe hairs



4m double high net at Merchants Millpond State Park

Healthy adult non-reproductive male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 2/11/2018. Band number: CALYX 0361. Frequency number: 150.204.



Lacking fur around eyes



Ear/tragus size and shape



Transmitter



Toe hairs



4m double high net at Merchants Millpond State Park

Healthy adult testes-descended male northern long-eared bat (*Myotis septentrionalis*) captured at Merchants Millpond State Park on 2/11/2018. Band number: CALYX 0363. Individual was not transmitted.



Lacking fur around eyes



Ear/tragus size and shape



Toe hairs



4m double high net at Merchants Millpond State Park

Appendix D

Roost Tree Data Forms

APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dylan Brooks Date: 11/17/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.431510 LONG -76.701690

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-13

Roost # 0 Roost Name: MM104R0

Roost Tree Data

Species: Liquidambar styraciflua Live Snag Other

(if other, explain) _____

DBH (in or cm) 10 cm Total Height (ft or m) 4.5 m

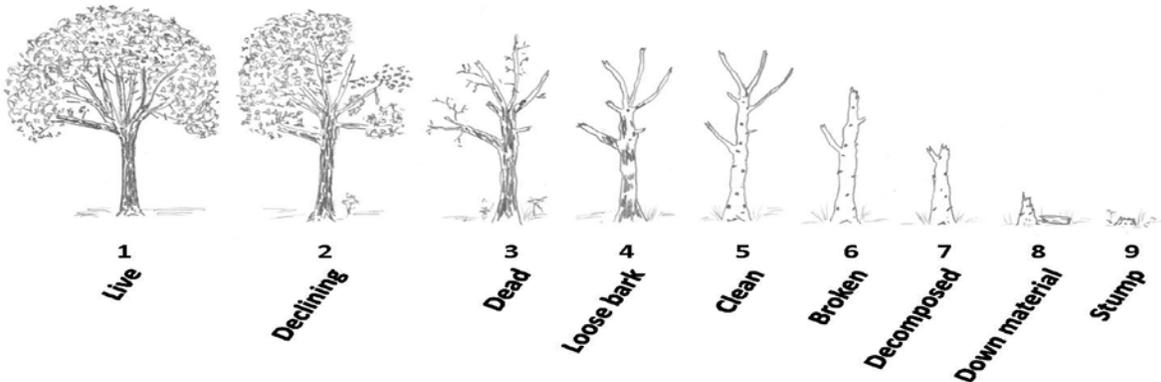
Height of roost area (if known) 3 m Dist. from capture site 111 m

Roost position aspect (deg) 110

Exfoliating bark on bole (%) 5 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Large cavity at broken off top of tree

Roost Decay State: 1 2 3 4 5 **6** 7 8 9 Other



APPENDIX D
PHASE 4 RADIO-TRACKING

Roost tree or snag canopy position: Dominant Co-Dominant Suppressed

Surrounding Habitat Condition

Canopy closure at roost (%) 80

Approximate woodlot size (ac or ha) 325 ha Distance to non-forest (ft or m) 21 m

Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)
Bottomland forest habitat

Additional Comments Bat moved during radio tracking during the day as a result of mild disturbance
at roost. Bat was then tracked to MM104R1 and emergence was done at that second tree.

Roost Tree: MM104R0

MYSE M104 was found in a *Liquidambar styraciflua* on 11/17/2017

*When tree was approached M104 emerged from MM104R0 and flew to MM104R1



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dylan Brooks Date: 11/17/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.429840 LONG -76.698680

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-13

Roost # 1 Roost Name: MM104R1

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 17.7 cm Total Height (ft or m) 18.3 m

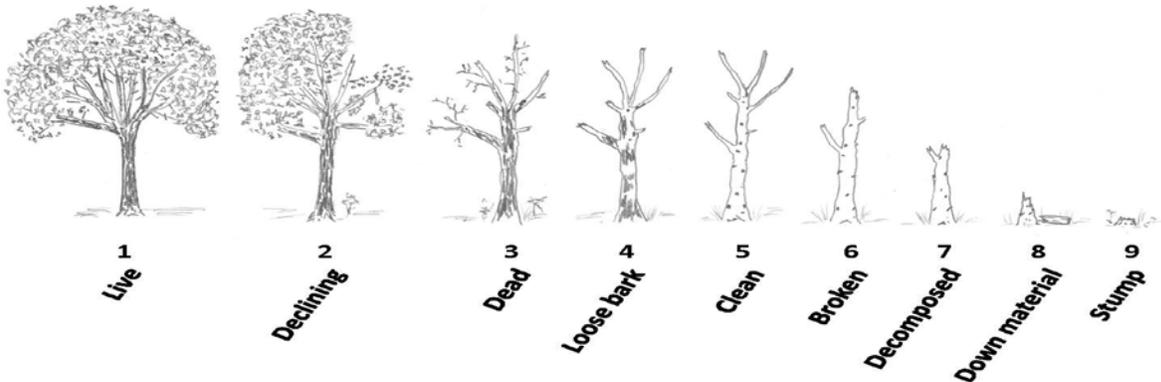
Height of roost area (if known) 1.5 m Dist. from capture site 210 m

Roost position aspect (deg) 150

Exfoliating bark on bole (%) 5 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Large cavity at base of tree

Roost Decay State: 1 2 3 4 5 **6** 7 8 9 Other



Roost Tree: MM104R1

MYSE M104 was found in a *Taxodium distichum* on 11/17/2017

*When tree was approached M104 emerged from MM104R0 and flew to MM104R1



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel Date: 11/19/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.430920 LONG -76.700410

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-13

Roost # 2 Roost Name: MM104R2

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 35.5 cm Total Height (ft or m) 22.8 m

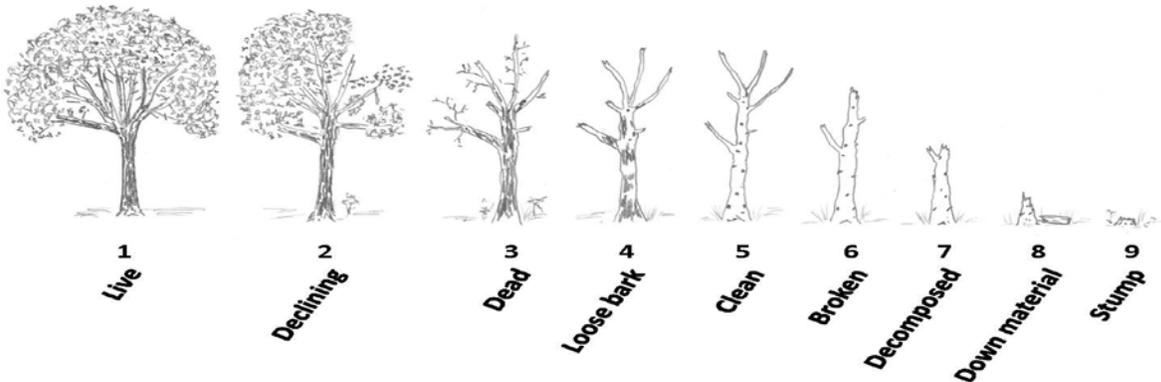
Height of roost area (if known) Unknown Dist. from capture site 56 m

Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 0 Describe: sloughing platy tight

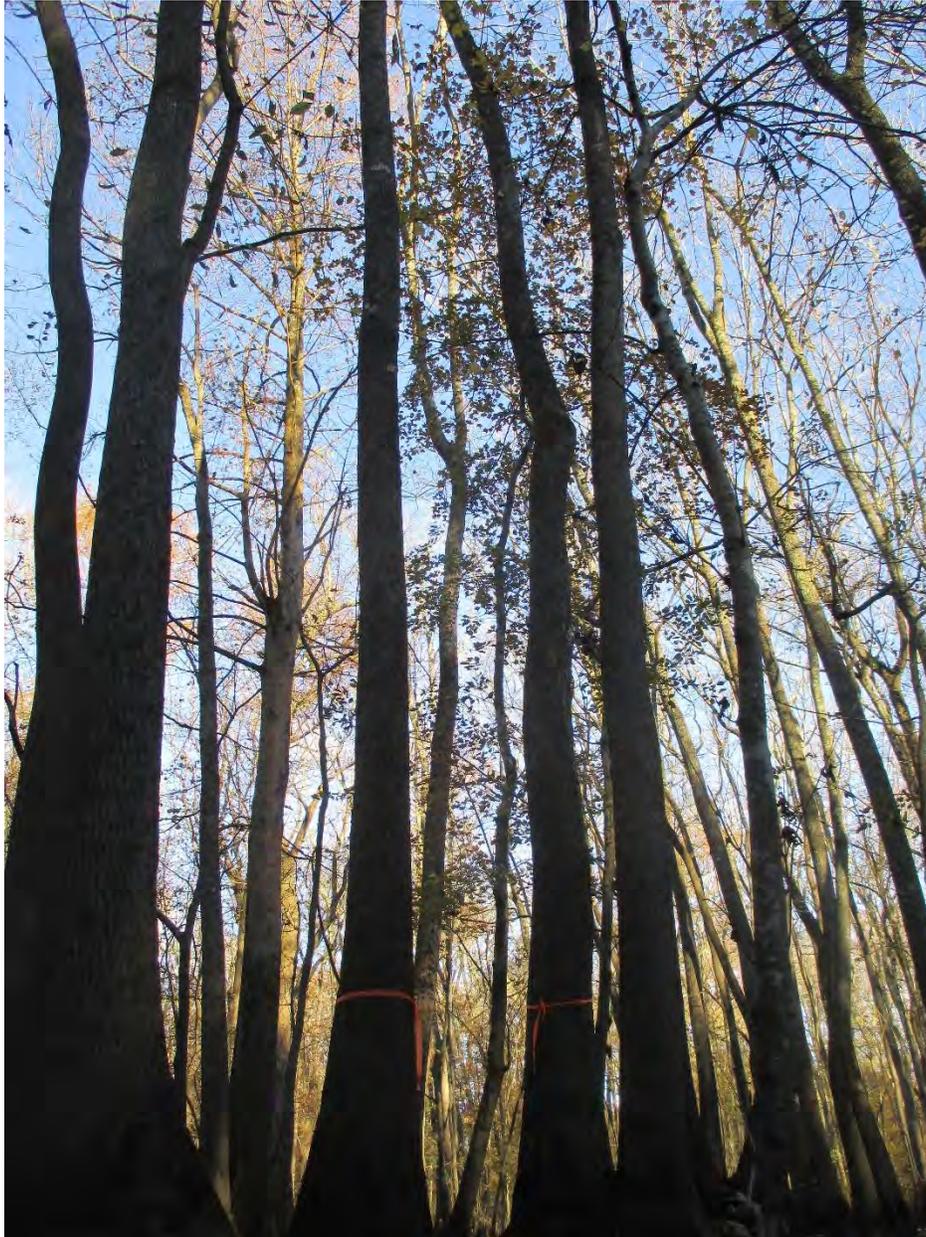
Cavities present? Yes If so, describe: Cavity present approximately 12 m up on tree

Roost Decay State: 1 2 3 4 5 6 7 8 9 Other



Roost Tree: MM104R2

MYSE M104 was found in a *Nyssa aquatica* on 11/19/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dylan Brooks Date: 11/20/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.431010 LONG -76.700600

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-13

Roost # 3 Roost Name: MM104R3

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 50.8 cm Total Height (ft or m) 21 m

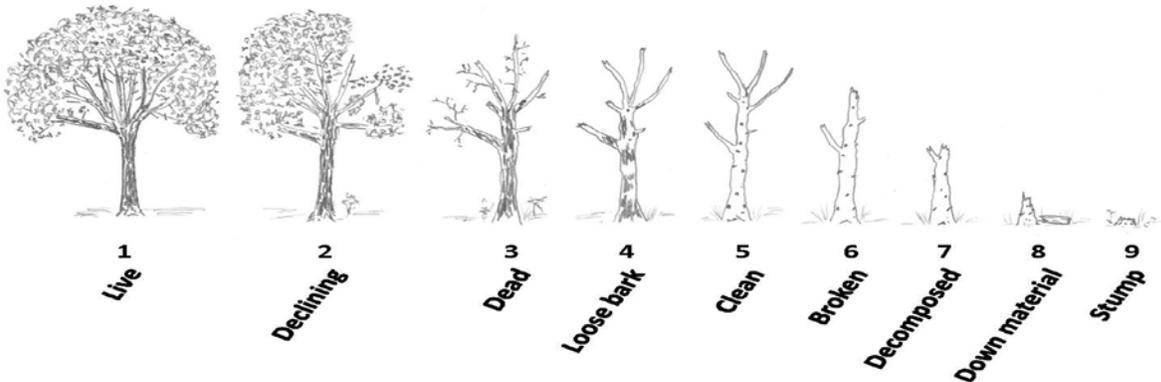
Height of roost area (if known) Unknown Dist. from capture site 50 m

Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 5 Describe: sloughing platy tight

Cavities present? No If so, describe: _____

Roost Decay State: ① 2 3 4 5 6 7 8 9 Other



Roost Tree: MM104R3

MYSE M104 was found in a *Nyssa aquatica* on 11/20/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): John Manuel Date: 11/26/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.431200 LONG -76.699090

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-13

Roost # 4 Roost Name: MM104R4

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 33 cm Total Height (ft or m) 9 m

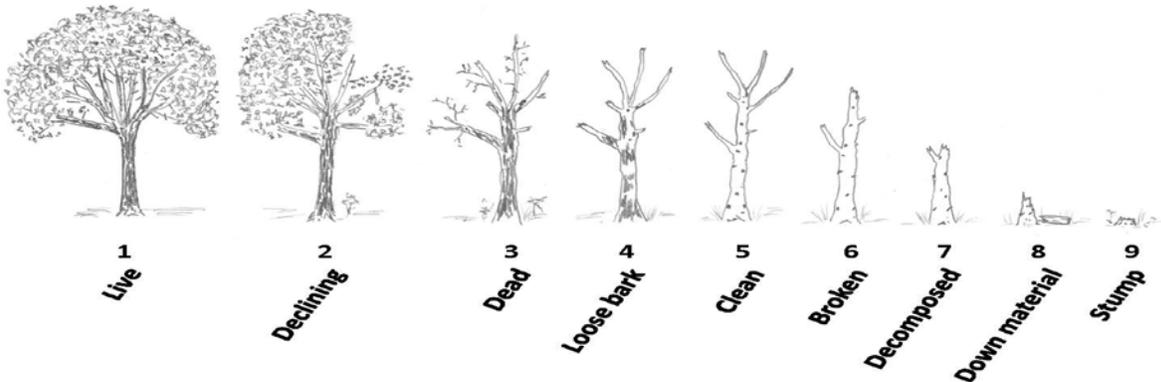
Height of roost area (if known) 7 m Dist. from capture site 206 m

Roost position aspect (deg) 20

Exfoliating bark on bole (%) 5 Describe: sloughing platy tight

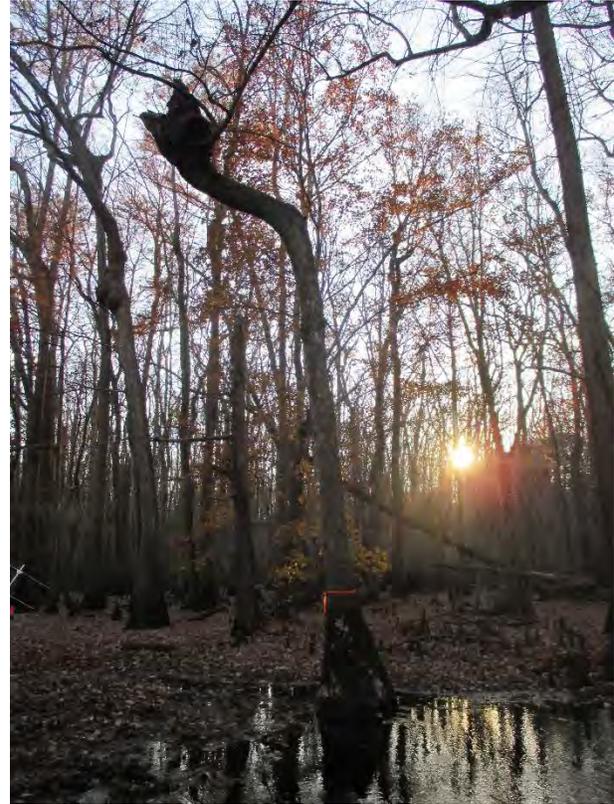
Cavities present? Yes If so, describe: Burl present at tree top with multiple cavities

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM104R4

MYSE M104 was found in a *Nyssa aquatica* on 11/26/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Jennifer Harrod Date: 11/30/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.430190 LONG -76.699960

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-13

Roost # 5 Roost Name: MM104R5

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 25.4 cm Total Height (ft or m) 15 m

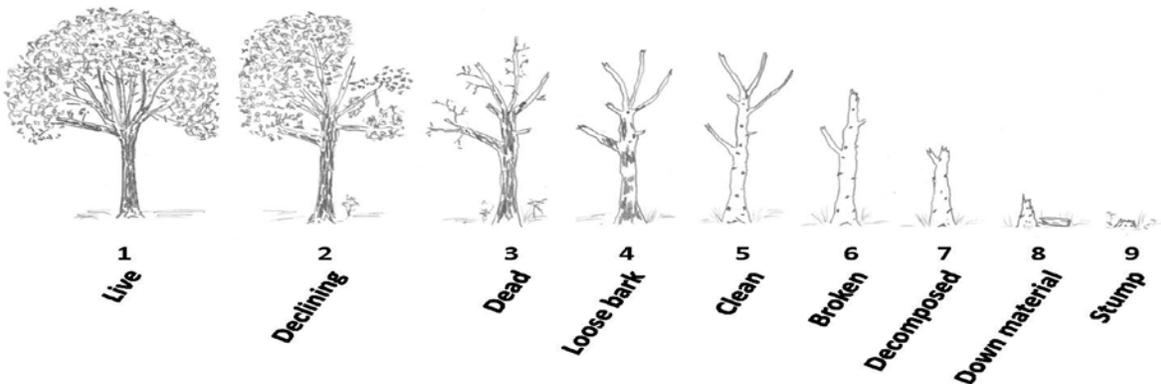
Height of roost area (if known) 2 m Dist. from capture site 121 m

Roost position aspect (deg) 350

Exfoliating bark on bole (%) 0 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Slender cavity about 0.3 m long

Roost Decay State: **①** 2 3 4 5 6 7 8 9 Other



Roost Tree: MM104R5

MYSE M104 was found in a *Taxodium distichum* on 11/30/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Brandon Bradley Date: 11/28/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.424570 LONG -76.707870

Property Owner: Keystone Forest Investments, LLC Phone# (252) 287-7205

State North Carolina County Gates Site # MM-13

Roost # 3 Roost Name: MM144R1

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 36 cm Total Height (ft or m) 19 m

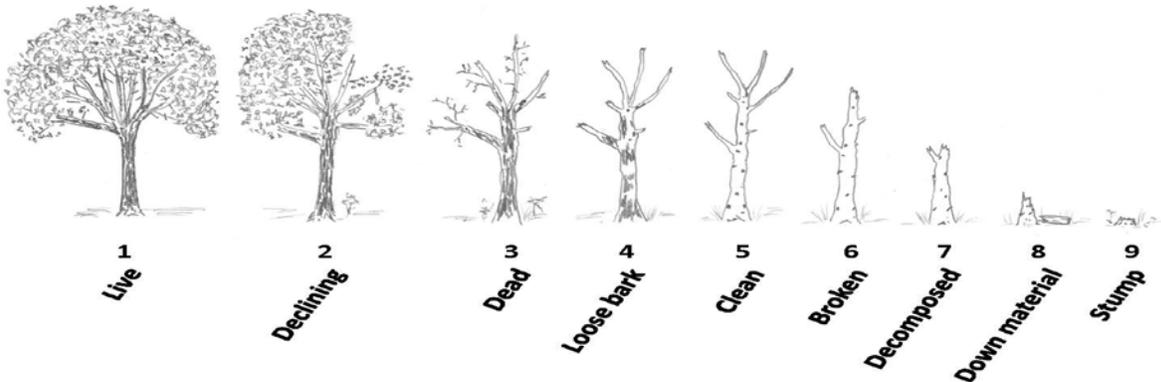
Height of roost area (if known) 15 m Dist. from capture site 1.27 km

Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 0 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Not known

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM144R1

MYSE M144 was found in a *Nyssa aquatica* on 11/28/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Mack Des Champs Date: 12/7/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.422970 LONG -76.711750

Property Owner: Keystone Forest Investments, LLC Phone# (252) 287-7205

State North Carolina County Gates Site # MM-02

Roost # 4 Roost Name: MM144R2

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 33 cm Total Height (ft or m) 21 m

Height of roost area (if known) 9 m Dist. from capture site 1.7 km

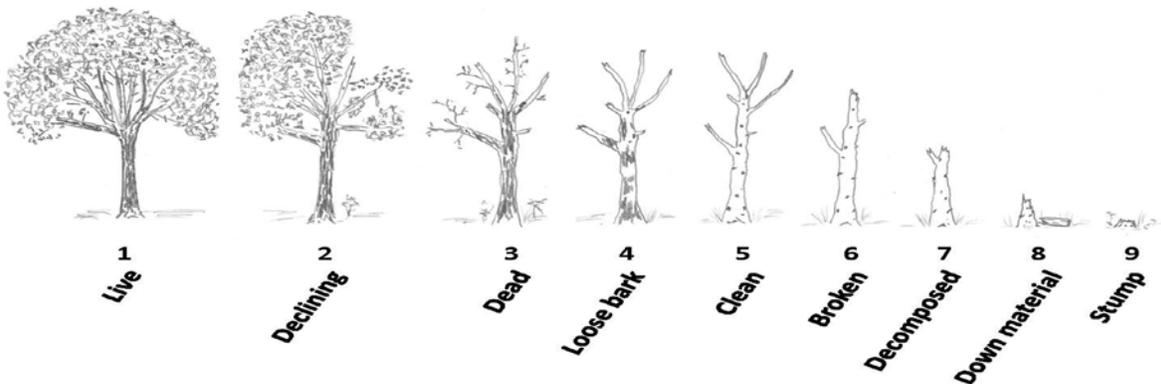
Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 0 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Small cavity present at branch approximately

9 m high in the tree

Roost Decay State: 1 2 3 4 5 6 7 8 9 Other



Roost Tree: MM144R2

MYSE M144 was found in a *Nyssa aquatica* on 12/7/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): John Manuel, Jennifer Harrod Date: 11/29/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.270450 LONG -75.985740

Property Owner: North River Gamelands Phone# (252) 482-1808

State North Carolina County Camden Site # NR-05

Roost # 1 Roost Name: NR064R1

Roost Tree Data

Species: Liquidambar styracifula Live Snag Other

(if other, explain) _____

DBH (in or cm) 28 cm Total Height (ft or m) 17 m

Height of roost area (if known) Unknown Dist. from capture site 346 m

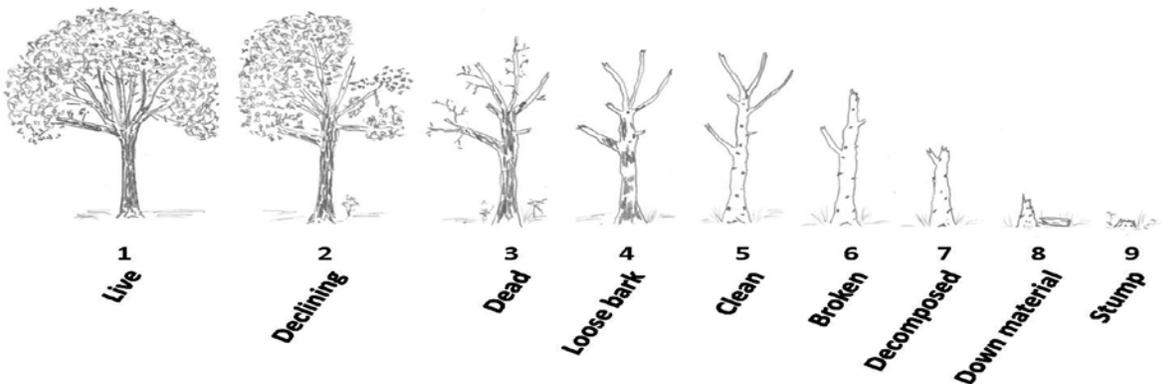
Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 5% Describe: sloughing platy tight

Cavities present? Yes If so, describe: Dead branch with exfoliating bark is the

likely roost

Roost Decay State: 1 3 4 5 6 7 8 9 Other



Roost Tree: NR064R1

MYSE M064 was found in a *Liquidambar styraciflua* on 11/29/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Dominique DiLandro Date: 12/4/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.436207 LONG -76.695431

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-02

Roost # 2 Roost Name: MM044R1

Roost Tree Data

Species: Taxodium ascendens Live Snag Other

(if other, explain) _____

DBH (in or cm) 33 cm Total Height (ft or m) 13.7 m

Height of roost area (if known) 7.6 m Dist. from capture site 191 m

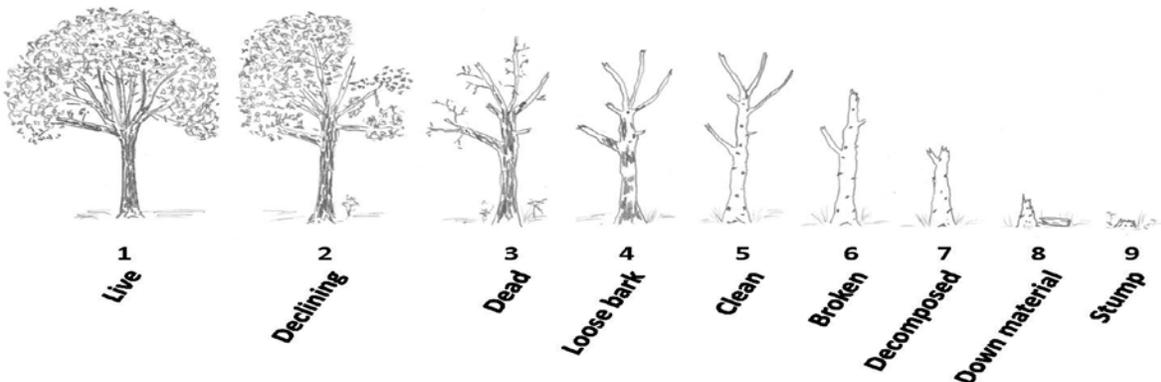
Roost position aspect (deg) 250

Exfoliating bark on bole (%) 5 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Small cavity present at branch approximately

7.6 m high in the tree

Roost Decay State: ① 2 3 4 5 6 7 8 9 Other



Roost Tree: MM044R1

MYSE M044 was found in a *Taxodium distichum* on 12/4/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Mack Des Champs Date: 12/7/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.422970 LONG -76.711750

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-02

Roost # 4 Roost Name: MM044R2

Roost Tree Data

Species: Taxodium ascendens Live Snag Other

(if other, explain) _____

DBH (in or cm) 33 cm Total Height (ft or m) 18 m

Height of roost area (if known) 30 m Dist. from capture site 214 m

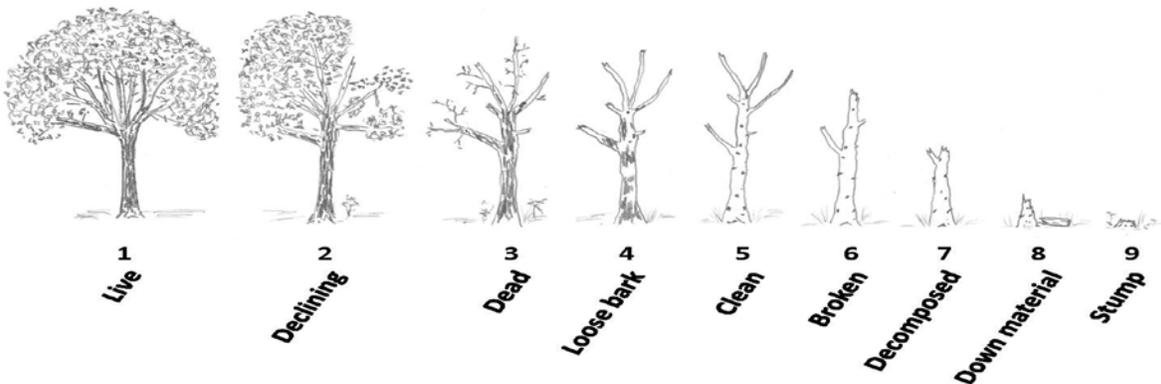
Roost position aspect (deg) 45 10

Exfoliating bark on bole (%) 10 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Small cavity present at branch approximately

9 m high in the tree

Roost Decay State: ① 2 3 4 5 6 7 8 9 Other



Roost Tree: MM044R2

MYSE M044 was found in a *Taxodium ascendens* on 12/7/2017



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Brandon Bradley Date: 12/16/2017

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.435950 LONG -76.695670

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-02

Roost # 5 Roost Name: MM044R3

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 30 cm Total Height (ft or m) 18 m

Height of roost area (if known) 1.2 m Dist. from capture site 233 m

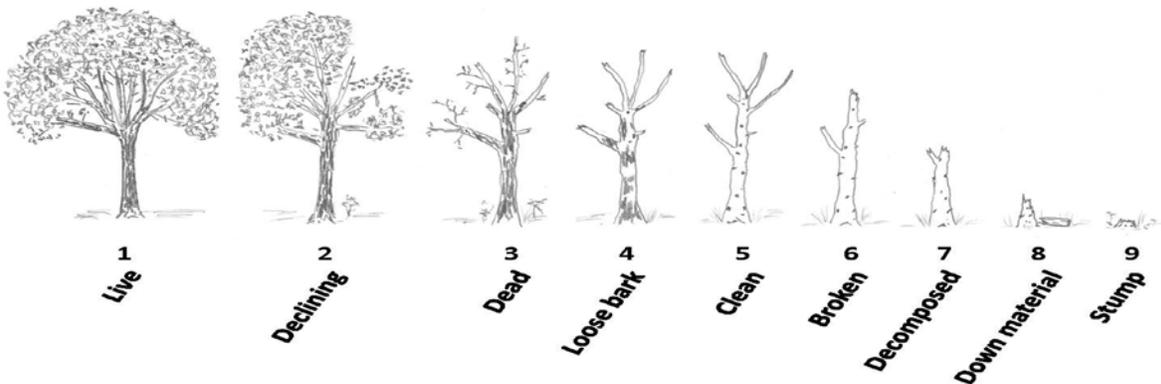
Roost position aspect (deg) 180

Exfoliating bark on bole (%) 5 Describe: sloughing platy tight

Cavities present? Yes If so, describe: The cavity was in swollen base of cypress. It

is also possible that it was roosting in a pile of cypress foliage and Spanish moss

Roost Decay State: ① 2 3 4 5 6 7 8 9 Other



Roost Tree: MM044R3

MYSE M044 was found in a *Taxodium distichum* on 12/16/2017

NO PHOTO

APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Brandon Bradley Date: 1/21/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.263870 LONG -75.994180

Property Owner: North River Game Land Phone# (252) 482-1808

State North Carolina County Camden Site # NR-04

Roost # 1 Roost Name: NR004R1

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 48 cm Total Height (ft or m) 23 m

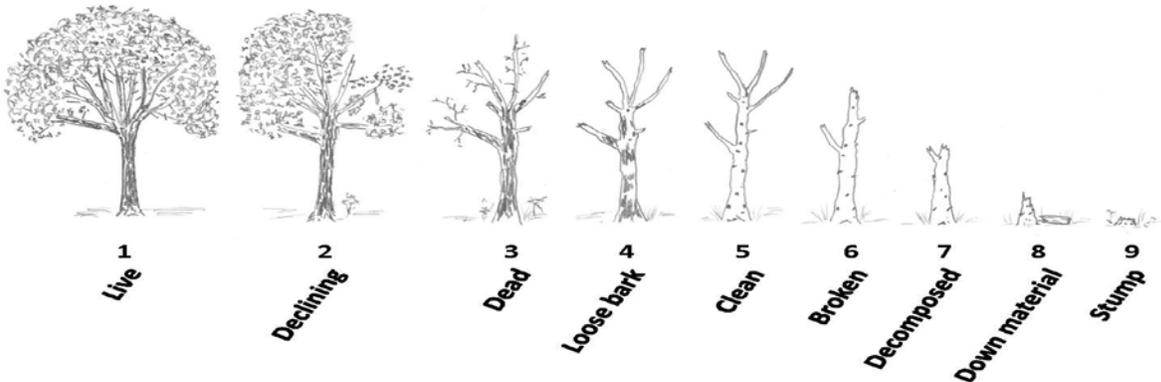
Height of roost area (if known) 18 m Dist. from capture site 1.8 km

Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 7 Describe: sloughing platy tight

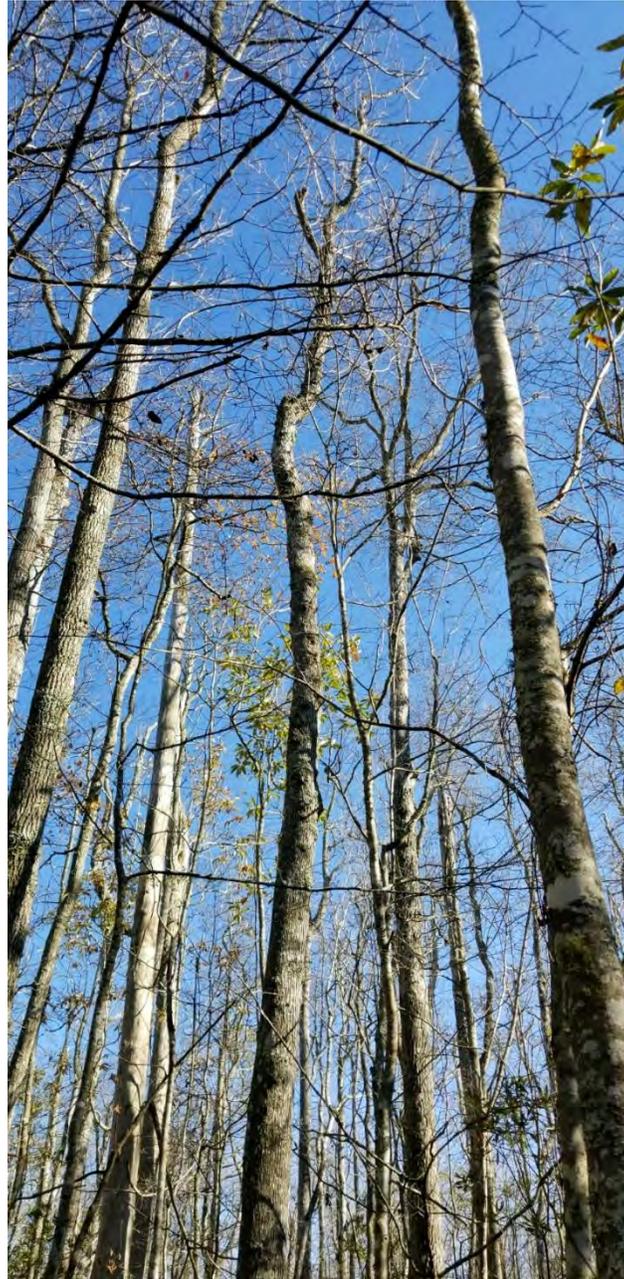
Cavities present? Yes If so, describe: Cavities located in the crooks of the tree

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: NR004R1

MYSE M004 was found in a *Nyssa aquatica* on 1/21/2018



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Kathryn Cunningham, Johnny Manuel Date: 2/12/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.430543 LONG -76.699643

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-19

Roost # 1 Roost Name: MM164R1

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 20 cm Total Height (ft or m) 18 m

Height of roost area (if known) 12 m Dist. from capture site 332 m

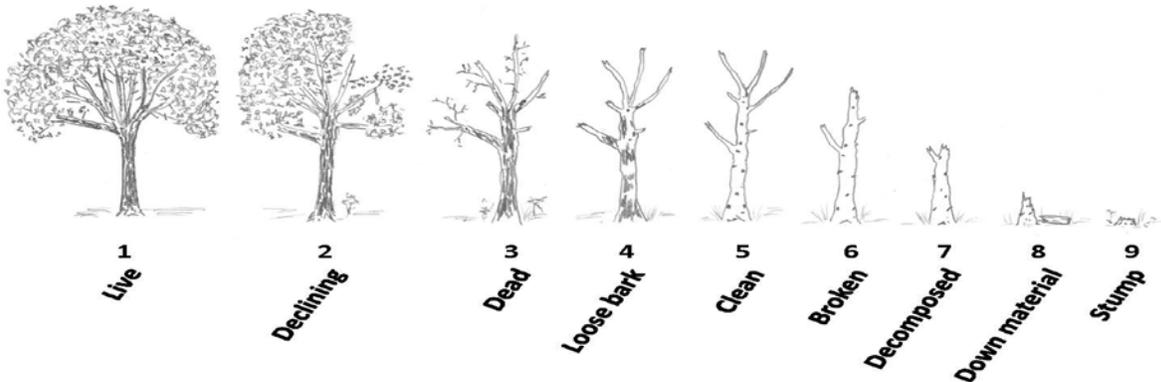
Roost position aspect (deg) 80

Exfoliating bark on bole (%) < 5% Describe: sloughing platy tight

Cavities present? Yes If so, describe: Cavity present on the bole of the tree about

12 m high.

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM164R1

MYSE M164 was found in a *Nyssa aquatica* on 2/12/2018



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Brandon Bradley Date: 2/14/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.432560 LONG -76.697660

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-19

Roost # 2 Roost Name: MM164R2

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 38 cm Total Height (ft or m) 15 m

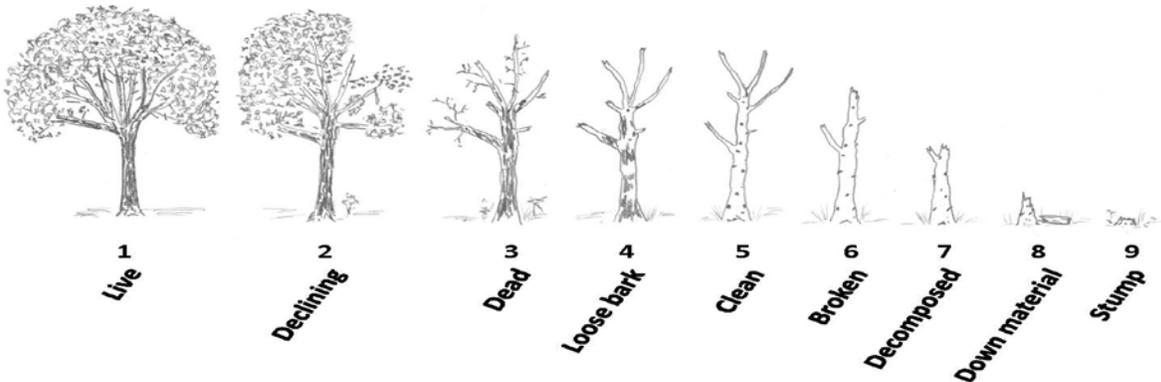
Height of roost area (if known) 6 m Dist. from capture site 66 m

Roost position aspect (deg) 250

Exfoliating bark on bole (%) 10% Describe: sloughing platy tight

Cavities present? Yes If so, describe: Cavities on dead branch 6 m up tree

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM164R2

MYSE M164 was found in a *Taxodium distichum* on 2/14/2018



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Kathryn Cunningham Date: 2/17/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.470645 LONG -76.772482

Property Owner: Mr. Smith Phone# (252) 357-1747

State North Carolina County Gates Site # MM-15

Roost # 1 Roost Name: MM184R1

Roost Tree Data

Species: Nyssa aquatica Live Snag Other

(if other, explain) _____

DBH (in or cm) 45.5 cm Total Height (ft or m) 23 m

Height of roost area (if known) Unknown Dist. from capture site 9.4 km

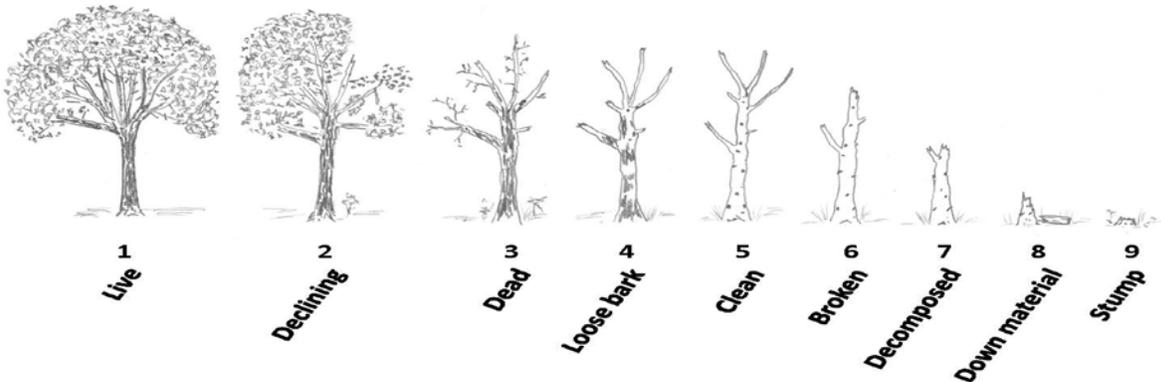
Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 0 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Broken branch approximately 15 m up.

Possible roost location

Roost Decay State: ① 2 3 4 5 6 7 8 9 Other



Roost Tree: MM184R1

MYSE M184 was found in a *Nyssa aquatica* on 2/17/2018



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Kathryn Cunningham, Johnny Manuel Date: 2/25/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.470037 LONG -76.774203

Property Owner: Mr. Smith Phone# (252) 357-1747

State North Carolina County Gates Site # MM-15

Roost # 2 Roost Name: MM184R2

Roost Tree Data

Species: Fraxinus caroliniana Live Snag Other

(if other, explain) _____

DBH (in or cm) 8.3 cm Total Height (ft or m) 6.7 m

Height of roost area (if known) 1.2 m Dist. from capture site 9.5 km

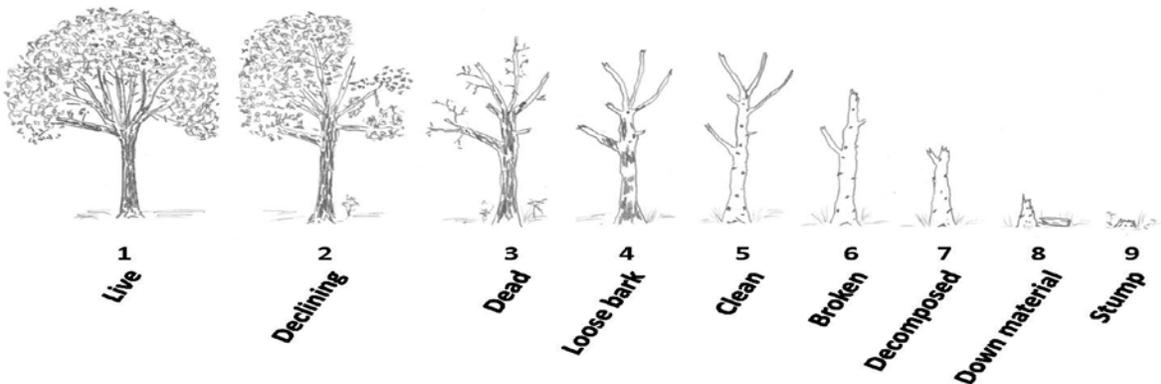
Roost position aspect (deg) 97

Exfoliating bark on bole (%) 0 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Small hole (approximately 2.5 cm x 3.5 cm

1.2 m above water. Could hear bat squeaking inside roost

Roost Decay State: ① 2 3 4 5 6 7 8 9 Other



Roost Tree: MM184R2

MYSE M184 was found in a *Fraxinus caroliniana* on 2/25/2018



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Kathryn Cunningham, Johnny Manuel Date: 2/26/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.469491 LONG -76.774699

Property Owner: Mr. Smith Phone# (252) 357-1747

State North Carolina County Gates Site # MM-15

Roost # 3 Roost Name: MM184R3

Roost Tree Data

Species: Fraxinus sp. Live Snag Other

(if other, explain) _____

DBH (in or cm) 21.5 cm Total Height (ft or m) 13.7 m

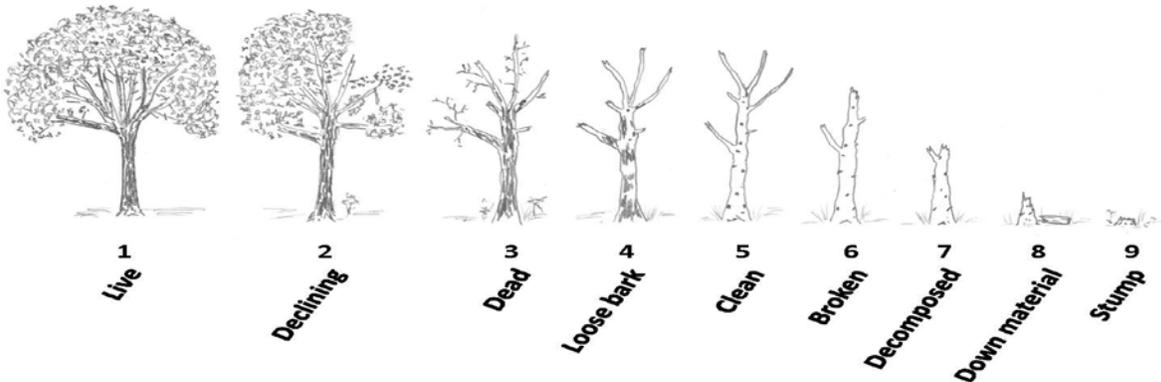
Height of roost area (if known) Unknown Dist. from capture site 9.5 km

Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 10 Describe: sloughing platy tight

Cavities present? Yes If so, describe: Several holes in tree starting approximately 6m above the water surface and going up that could be potential roosting areas

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM184R3

MYSE M184 was found in a *Fraxinus* sp. on 2/26/2018



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dylan Brooks Date: 2/20/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.431840 LONG -76.697530

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-19

Roost # 1 Roost Name: MM204R1

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 25.5 cm Total Height (ft or m) 20 m

Height of roost area (if known) Unknown Dist. from capture site 42 m

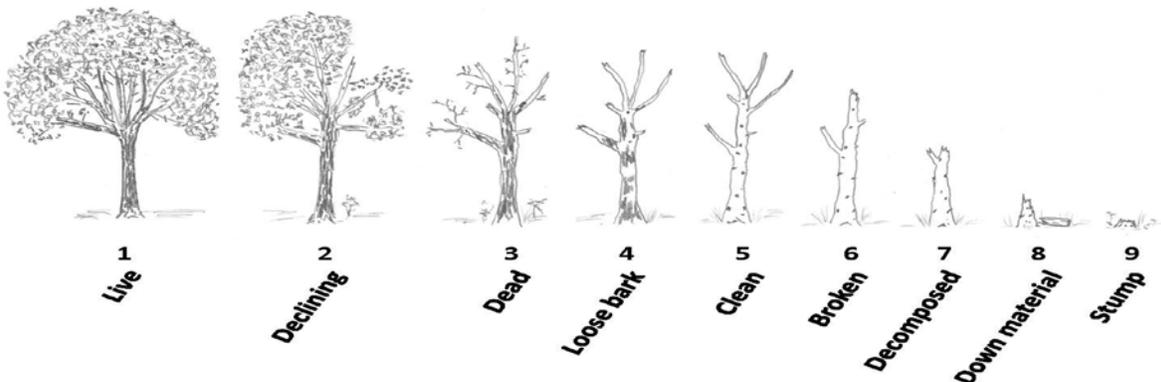
Roost position aspect (deg) Unknown

Exfoliating bark on bole (%) 15% Describe: sloughing platy tight

Cavities present? Yes If so, describe: Small cavity located on broken branch

approximately 16.7 m high on the tree.

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM204R1

MYSE M204 was found in a *Taxodium distichum* on 2/13/2018

*When emergence was done M204 moved from roost tree MM204R1 to MM204R2



APPENDIX D
PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): John Manuel, Blake Ellett Date: 2/20/2018

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.432510 LONG -76.697580

Property Owner: Merchants Millpond State Park Phone# (252) 357-1191

State North Carolina County Gates Site # MM-19

Roost # 2 Roost Name: MM204R2

Roost Tree Data

Species: Taxodium distichum Live Snag Other

(if other, explain) _____

DBH (in or cm) 35.5 cm Total Height (ft or m) 20 m

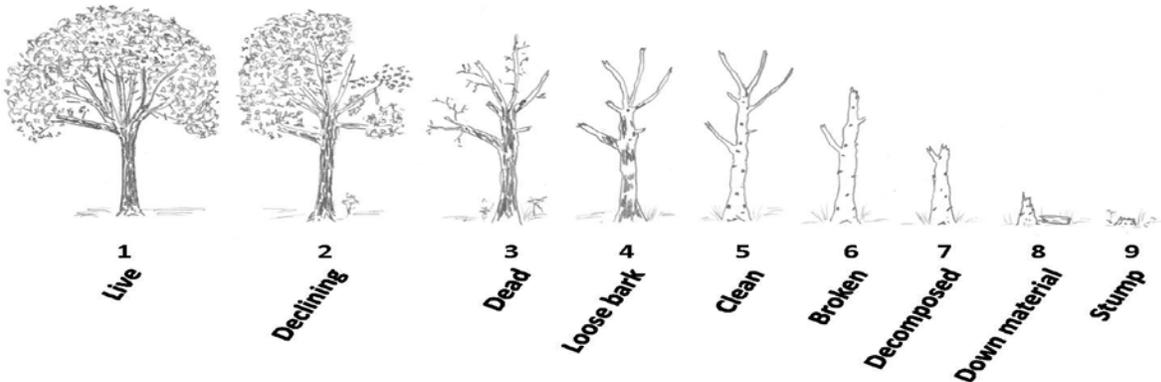
Height of roost area (if known) 12 m Dist. from capture site 56 m

Roost position aspect (deg) 250

Exfoliating bark on bole (%) 10% Describe: sloughing platy tight

Cavities present? Yes If so, describe: 0.3 m diameter cavity in hollowed out buttress

Roost Decay State: 1 **2** 3 4 5 6 7 8 9 Other



Roost Tree: MM204R2

MYSE M204 was found in a *Taxodium distichum* on 2/20/2018

*When emergence was done M204 moved from roost tree MM204R1 to MM204R2



Appendix E

Emergence Count Data Forms

