



Supplemental Draft Environmental Impact Statement and Updated Draft Section 4(f) Evaluation

APPENDIX H

FINAL TECHNICAL STUDY PLAN - ACOUSTIC SURVEYS THREATENED AND ENDANGERED BAT SPECIES

**I-495 & I-270 Managed Lanes Study
Final Technical Study Plan - Acoustic Surveys
Threatened and Endangered Bat Species
Indiana bat (*Myotis sodalis*) and Northern long-eared bat (*Myotis septentrionalis*)**

INTRODUCTION

The following phased Study Plan presents threatened and endangered (T&E) bat species survey approaches for the I-495 & I-270 Managed Lanes Study (MLS). As part of the scope of services, Rummel, Klepper, & Kahl (RK&K) will require a final plan of study for the MLS upon receiving input from the United States Fish and Wildlife Service (USFWS).

The MLS is considered linear as it relates to the threatened and endangered (T&E) bat species survey protocols. The majority of the Project is located within the vicinity of Washington D.C. and includes fragmented forested habitat. The USFWS Chesapeake Bay Field Office is the lead agency overseeing T&E bat species for this project. The Indiana bat (*Myotis sodalis*) is currently listed as Endangered in the state of Maryland and falls under the jurisdiction of the USFWS and the Maryland Department of Natural Resources (MDNR). The northern long-eared bat (*Myotis septentrionalis*) is currently listed as Threatened by USFWS and MDNR.

TASK 1- HABITAT ASSESSMENT

Background

RK&K has completed a Geographic Information System (GIS) desktop review of the MLS area, identifying forested habitat components and forested areas 15 acres and larger. The GIS forest layer was developed based on desktop review of the Chesapeake Conservancy Conservation Innovation Center's High Resolution Land Cover Data for tree canopy cover. In the Virginia portion of the corridor study boundary, the aerial extent of vegetation cover was identified using GIS data obtained from the Virginia Department of Forestry (VDOF) 2005 Virginia Forest Cover dataset. The desktop review is the first component of a multi-phased habitat assessment. Using this standard approach, total suitable summer habitat will be determined by GIS desktop review, field evaluation and Appendix F (Linear Project Guidance) of the USFWS 2020 Survey Guidelines. Desktop determined forested segments of the project will be compiled and field evaluated for accuracy. The data collected will be compiled and used to determine acoustic survey intensity outlined in Task 2 of the Study Plan. The following outlines the main components of the proposed bat habitat assessment.

Habitat Assessment

A threatened and endangered bat habitat assessment evaluation of the MLS potential limits of disturbance (LOD) associated with the DEIS alternatives is proposed and will be performed by a USFWS Qualified Bat Surveyor (QBS) from RK&K. Due to the geographic location/urbanization of the study corridor, the potential for large tracts of suitable habitat is unlikely. RK&K proposes that the results of Task 1 of the Study Plan be utilized to determine the level of survey effort in Task 2.

The field evaluation effort associated with the bat habitat assessment will verify preliminary desktop information collected regarding forest land and potential hibernacula. The forested components will be qualitatively evaluated for potential use by threatened and endangered bat species. Based on best professional judgment and the evaluation of potential bat habitat by RK&K, forested components of the MLS LODs will be classified into forest habitat types (FHTs): Forest Habitat Type 1 (FHT 1), Forest Habitat Type 2 (FHT 2), and Forest Habitat Type 3 (FHT 3). The FHTs within the LODs will be characterized by the following:

- **FHT 1** is more likely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas include suitable habitat for T&E bat species.
- **FHT 2** is less likely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas include suitable habitat for T&E bat species.
- **FHT 3** is unlikely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas do not include suitable habitat for T&E bat species

FHT-1 - This habitat type is more likely to be used as roosting, travel and foraging habitat by T&E bats due to forest characteristics. This FHT typically includes a mixed-age deciduous hardwood forest with plenty of pole stage and mature hardwoods. The understory will be open and have moderate to no shrub layer or a moderate understory with travel corridors and forage areas including trails, forest openings, and nearby waterways. Dominant tree species may include, live and dead or dying red maple (*Acer rubrum*), sugar maple (*A. saccharum*), shagbark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), black locust (*Robinia pseudoacacia*), and willow (*Salix* sp.). Potential roost locations will be plentiful in this FHT. Tree/snag

physical location, bark condition, and topographic setting is more crucial to consideration as bat habitat than tree species.

FHT-2 - This habitat type is less likely to be used as roosting, travel, and foraging habitat by T&E bats due to forest characteristics, however; FHT-2s still may be used by T&E bats in some capacity. The existing timber typically includes mixed-age deciduous hardwood sapling stage to immature timber but includes a moderate to dense shrub layer and the forest may be disturbed or manipulated. The understory includes a moderate to dense shrub layer, with few travel corridors, forage areas, and nearby waterways. Potential roost sites are not as readily available as in FHT-1. Dominant tree and shrub species identified within FHT-2 may include red maple, sugar maple, tree of heaven (*Ailanthus altissima*), hawthorn (*Crataegus* sp.), American beech, Norway spruce (*Picea abies*), black cherry, white oak, black locust and elm (*Ulmus* sp.). Understory would be dominated by spicebush (*Lindera benzoin*), honeysuckle (*Lonicera* spp.), multiflora rose (*Rosa multiflora*), blackberry (*Rubus* sp.), poison ivy (*Toxicodendron radicans*), and grape vine (*Vitis* sp.) or similar species. Tree/snag physical location, bark condition, and topographic setting is more crucial to consideration as bat habitat than tree species.

FHT-3 - This habitat type is unlikely to be used by T&E bats due to forest characteristics. The existing timber includes deciduous hardwood sapling stage timber. The understory includes a dense shrub and vine layer and the forest is highly disturbed, manipulated, and/or fragmented. Roost sites are not readily available, nor are travel corridors, forage areas, or nearby waterways. In these areas, common species identified included honeysuckle, multiflora rose, black locust, blackberry, sumac (*Rhus typhina*), poison ivy, and grape vine.

The classifications resulting from the Task 1 habitat assessment will be utilized to determine the total acoustic survey effort for the MLS. RK&K recommends that FHT 1 and FHT 2 habitat area lengths be utilized when calculating the total suitable habitat length for the project. These results would determine the number of acoustic survey sites for the study area and acoustic survey sites would be located in FHT 1 and 2 habitat areas.

In addition to habitat characterization, RK&K recommends the study area be assessed for potential bat hibernacula. RK&K will coordinate with field staff regarding MLS-specific field features previously identified within the LOD. Any information regarding potential bat hibernacula (natural cave openings,

mines, or voids) will be included as part of the final report for the MLS. Any hibernacula identified would need to be assessed as part of another field effort specific to bat hibernacula.

TASK 2- ACOUSTICS SURVEY

RK&K proposes to conduct an acoustic bat survey for the MLS. Acoustics is the presence/absence survey method that will be used for the I-495/I-270: Managed Lanes Study. Sampling will be performed in accordance with the USFWS survey protocol, Range-wide Indiana Bat Summer Survey Guidelines, 2020. The MLS study corridor is located in the Washington D.C. Metropolitan Area, spanning 48-miles, including portions of Prince George's and Montgomery Counties in Maryland and Fairfax County in Virginia, and is considered "linear" as it relates to the USFWS Indiana Bat Survey Protocols. Each acoustic survey site would be located within suitable forested habitat areas FHT-1 and FHT-2 and would be surveyed using USFWS guidelines.

USFWS currently identifies the acoustic survey as one of the preferred techniques for evaluating projects that have the potential to affect the Indiana and/or northern long-eared bats. Should an Indiana bat or northern long-eared bat call be identified, further USFWS coordination will be required.

The level of effort for the acoustic survey is based on the USFWS 2020 Survey Guidelines. The USFWS guidance recommends a minimum of two detector nights of effort per 1 kilometer (0.6 mile) of suitable habitat. The results of the aforementioned Habitat Assessment (Task 1) determined the total number of acoustic survey sites for the MLS. Monitoring locations were selected by an RK&K qualified bat biologist for likelihood of use and habitat characteristics most likely to provide clear, identifiable bat calls to the maximum extent practicable and are identified on preliminary project mapping. Monitoring locations are representative of the entire project area and are spatially distributed to maximize coverage of suitable habitat identified. Attempts were made to identify a potential survey location within each KM of suitable habitat. Preliminary review of the suitable habitat areas within the project area have identified approximately 66 kilometers of suitable habitat. This will result in a minimum of 132 detector nights of survey for the project and approximately 66 detector locations.

The survey will occur during the 2020 Indiana bat survey season (May 15th-August 15th). The exact start date of the acoustic surveys is dependent on weather conditions, staff availability, and obtaining concurrence of this study plan from USFWS. Once the survey begins it will continue until its conclusion.

The survey is anticipated to be ongoing for approximately 4 weeks. Both USFWS and the appropriate state agencies will be informed in advance once the survey start date is determined.

RK&K will provide survey crews of qualified biologists for the selection of survey locations and bat call analysis. Wildlife Acoustics SM4 passive acoustic monitoring devices will be used to survey selected locations. Weatherproof omni-directional ultrasonic microphones will be used in combination with the acoustic units. Microphones will be mounted to the ends of ten-foot aluminum or steel poles that will be positioned atop iron rebar spikes for stability. The microphones will be oriented parallel with the ground towards potential roosting habitat areas (i.e., forested areas) or potential foraging/travel habitat. Each acoustic survey location will be surveyed at least twice over the course of the entire survey. All recordings will be completed in full-spectrum mode and the appropriate Kaleidoscope® Pro (Wildlife Acoustics, Inc.) acoustic identification software will be used to provide verification on species identification per the USFWS 2020 Survey Guidelines. A USFWS/USGS approved version of Kaleidoscope® Pro will be chosen for the automated ID process. Currently, versions 4.2.0 & 5.1.0 are approved by USFWS/USG. Qualitative call analysis (manual vetting) will be conducted by a trained RK&K bat biologist to verify calls of potential T&E bat species.

In addition to the acoustic surveys outlined, RK&K proposes additional acoustic survey locations described in the following subsection.

TASK 3- ACOUSTIC SURVEY- Bridge Locations

Previous field assessments within the project area have determined that four bridge locations house existing bat populations. RK&K is recommending these locations be surveyed acoustically for T&E bat species in addition to the remaining forested portions of the project area. Suitable habitat areas anticipated will include these locations:

- 1) American Legion Bridge over the Potomac River; and
- 2) I-495 Bridge over the NW Branch of the Anacostia River
- 3) MacArthur Boulevard/Clara Barton Parkway Westbound bridge (due to guano presence)
- 4) Seven Locks Road bridge (due to guano presence)

RK&K personnel will conduct acoustic monitoring at the aforementioned bridges, to determine the presence or probable absence of the federally threatened northern long-eared bat and federally

endangered Indiana bat. Using this approach and based on existing site conditions, each bridge structure is being considered 1 kilometer of suitable habitat. Therefore, these bridge locations will add an additional 4 acoustic survey locations to the total number of survey locations.

The following four bridges need to be evaluated for bat use during the summer survey season which is from May 15 through August 15. Any of the following bridges that have bat use documented will be added to the acoustic survey using the aforementioned methods.

- Kenilworth Avenue over I-495
- Greenbelt Road under I-495
- Eastbound Clara Barton Parkway (101010/142010)
- Suitland Parkway (160015/160016)

MIST NETTING AND RADIO TELEMETRY

Mist netting surveys and radio telemetry were planned for this bat study but the U.S. Fish and Wildlife Service (Service) asked that we temporarily postpone mist-netting surveys and radio telemetry for the I-495/I-270: Managed Lanes Study due to the potential risks of humans transmitting the COVID-19 virus (SARS CoV-2) to North American bats. If Service guidance on the COVID-19 virus (SARS CoV-2) changes during the 2020 spring/summer survey season, mist netting surveys and radio telemetry will be conducted for the I-495/I-270: Managed Lanes Study under Section 7(a)(1) of the Endangered Species Act which requires Federal agencies to use their authorities to further the conservation of listed species.

Reporting

An electronic PDF copy of the survey report will be prepared and submitted to MDOT SHA, USFWS and MDNR. This report will include methodologies and results for Tasks 1 and 2 previously outlined. In addition, the USFWS Excel reporting table will be completed and uploaded.



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APPENDIX H

ADDITIONAL BRIDGE SURVEY REPORT FOR THE LONG-EARED BAT AND INDIANA BAT

Draft Additional Bridge Survey Report for the Northern Long-Eared Bat (*Myotis septentrionalis*) and Indiana Bat (*Myotis sodalis*)

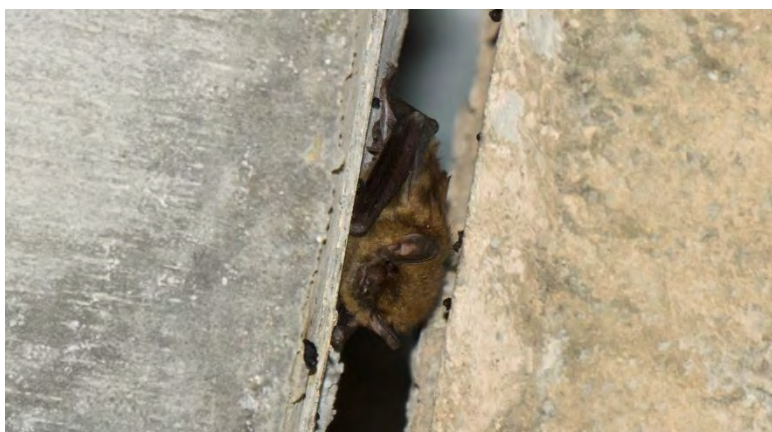
I-495 & I-270 Managed Lanes Study Montgomery and Prince George's Counties, Maryland & Fairfax County, Virginia

Prepared for:

Maryland Department of Transportation State Highway Administration

Under Contract to:

Rummel Klepper & Kahl



November 2020

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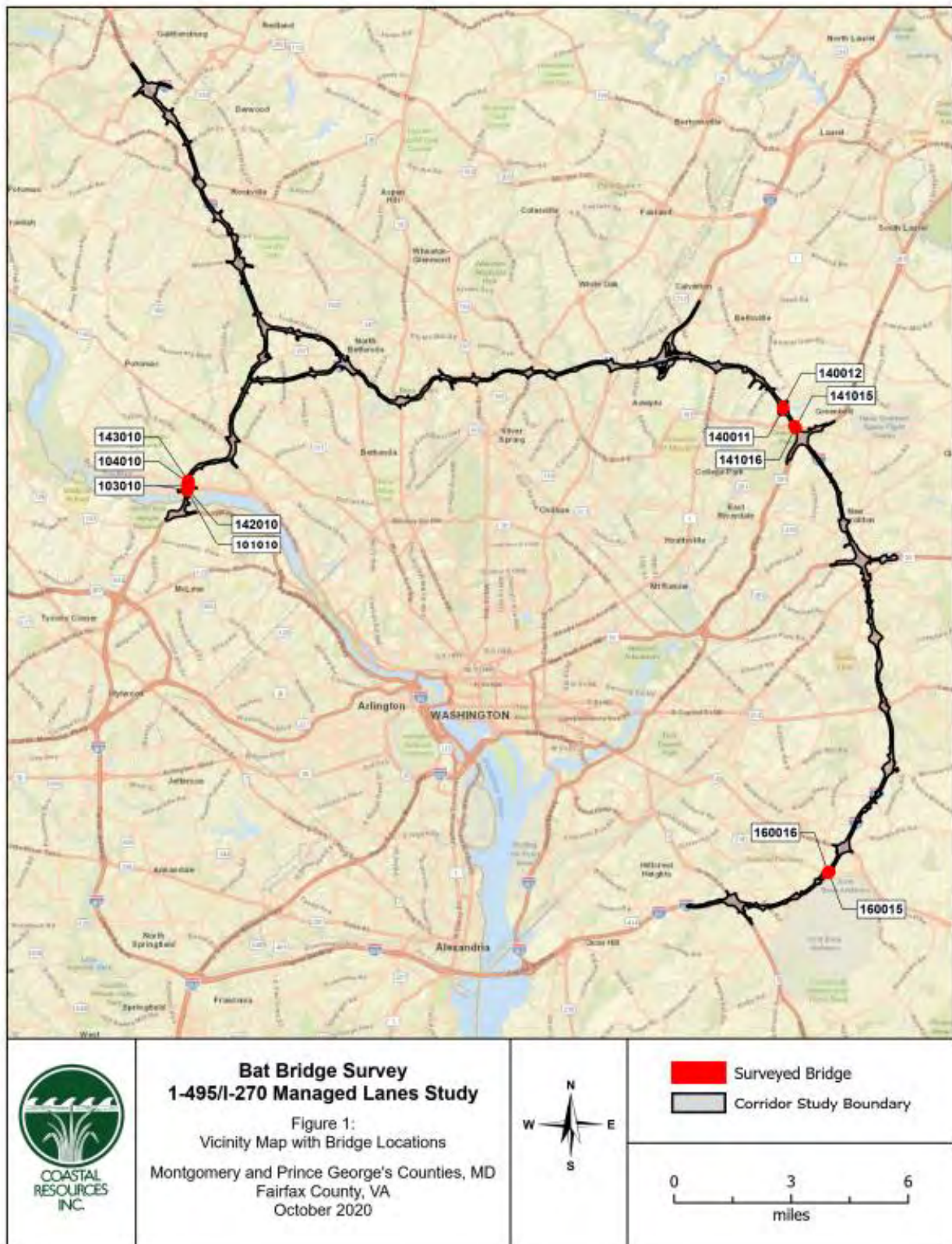
Introduction

The Maryland Department of Transportation State Highway Administration (MDOT SHA) and Federal Highway Administration (FHWA) have initiated a highway improvements study of the I-495 and I-270 corridor. This study, referred to as the I-495 & I-270 Managed Lanes Study (MLS), is being conducted to address major traffic congestion problems within the National Capital Region. As part of the environmental review process for the MLS, coordination was initiated with state and federal regulatory agencies in 2018 regarding the potential presence of listed rare, threatened, or endangered (RTE) species within the corridor study boundary (CSB). The CSB is shown in **Figure 1 – Location Map**.

The initial coordination with the U.S. Fish and Wildlife Service (USFWS) and Maryland Department of Natural Resources (MDNR) resulted in informal consultation regarding the Northern Long-eared Bat (*Myotis septentrionalis*) (NLEB) and Indiana Bat (*Myotis sodalis*) (IB), two federally-listed bat species potentially occurring within the CSB. As part of this consultation, MDOT SHA conducted bridge surveys for the presence of roosting bats during the summer of 2019. Seventeen (17) bridge spans representing 15 road or stream crossings were surveyed between August 5th and August 12th for the presence of roosting bats. Bridges associated with two road crossings (Clara Barton Parkway Eastbound and Suitland Parkway) could not be surveyed because of ongoing construction. In addition to the bridge surveys, the USFWS recommended that bat emergence surveys be conducted at the American Legion Bridge and the bridge over Northwest Branch. The emergence surveys were conducted on August 12th and 13th, 2020. Roosting Big Brown Bats (*Eptesicus fuscus*) were found in bridge span crevices of the McArthur Boulevard/Clara Barton Parkway Westbound bridge during bridge surveys and bats were observed flying beneath both the American Legion Bridge and bridge over Northwest Branch during the emergence surveys.

The results of these surveys were presented to the regulatory agencies in a report submitted in October 2019. MDOT SHA then convened a meeting with the regulatory agencies on December 4, 2019 to discuss the results of the bridge and emergence surveys and to chart further suitable maternity roosting habitat assessments and presence/absence surveys. During this meeting, the USFWS requested that MDOT SHA conduct follow-up bridge surveys for bats at Clara Barton Parkway Eastbound and at Suitland Parkway that were unable to be surveyed during 2019 because of construction activities. They also requested that two additional bridges be surveyed, including the north and south spans of Kenilworth Avenue and the two spans of Greenbelt Road. Therefore, this report summarizes the results of the 2020 bridge bat assessments conducted for the MLS.

Figure 1. Location Map



Methodology

Eight (8) bridges plus their associated ramps were surveyed in 2020 for the presence of day-roosting bats or evidence (e.g., guano or urine staining) of night roosting bats. The eight (8) bridges and associated ramps surveyed are listed in **Table 1** along with approximate bridge lengths, widths, vertical clearances, and other relevant information. The McArthur Boulevard/Clara Barton Parkway Westbound bridge was re-surveyed this year because bats were found roosting under this bridge in gaps between pier caps during the 2019 surveys. The federal bridge identification numbers have been shortened to just the last six digits for simplicity. Bridges and associated ramps that had at least one common abutment were assessed together; these structure dimensions are included on the same row of the table. Those ramps with completely independent abutments were treated as a separate bridge structure and are shown as a separate row in the table.

Table 1. I-495 & I-270 Managed Lanes Study bridges assessed for bat presence.

Federal Bridge ID ¹	Bridge Name/Location	Structure Length (Ft)	Deck Width (Ft)	Min. Vertical Clearance ² (Ft)	Comments
101010/ 142010/ 103010	Clara Barton Pkwy EB	361/ 439/220	158/ 28/28	20/ 14/14	Includes ramp from I-495 NB to Clara Barton Pkwy WB and Clara Barton Pkwy to I-495 SB
104010/ 143010	McArthur Blvd/Clara Barton Pkwy WB	607/ 336	150/ 28	13/ 16	Includes ramp from I-495 SB to Clara Barton Pkwy WB
140011	Kenilworth Avenue N	293	55	15	Kenilworth Ave N over I-495
140012	Kenilworth Avenue S	301	55	18	Kenilworth Ave S over I-495
141016	Greenbelt Road	193	71	16	I-495 Inner Loop over Greenbelt Rd.
141015	Greenbelt Road	193	59	16	I-495 Outer Loop over Greenbelt Rd.
160016	Suitland Parkway	387	59	14	I-495 Inner Loop over Suitland Pkwy
160015	Suitland Parkway	392	59	14	I-495 Outer Loop over Suitland Pkwy

¹Last 6 digits of Federal Bridge Structure Number

²Vertical clearance refers to the minimum vertical underclearance of the bridge over a roadway or waterbody

Field maps on an aerial base image were prepared that highlighted each of the eight (8) selected bridges and associated ramps to be surveyed (**Appendix A**). Equipment used in the visual assessments and for safety included high powered spotlights, binoculars, digital cameras, hardhats, high visibility vests, and iPads with the Arc Collector application installed to record all survey data.

Systematic visual surveys of bridges were conducted during daylight hours on June 29, 2020. Each bridge structure survey was carried out by two surveyors. Surfaces beneath the bridges were assessed across their entire span from the junction of each abutment with the bridge deck. Inspections included visual surveys of all abutments, decks, piers, and other structures associated with each bridge. Suitable roosting habitat for bats on bridge structures includes cracks or crevices formed from spalling concrete, junctions of the bridge abutment with the bridge deck, expansion joints, and other cave-like areas associated with bridges. Surveys for the presence of day roosting bats typically began at each abutment with surveyors shining bright spotlights into dark spaces across the entire width of each bridge. The assessment then extended along the bridge deck and included each bridge pier and cap across each bridge width and length, focusing greatest attention on spaces generally less than two inches in width. In addition to looking for the visual presence of day roosting bats, evidence of bats was also assessed by listening for high pitched squeaking sounds of day roosting bats and searching for guano or urine staining or odor that may indicate use by day or night roosting bats.

As noted above, FHWA/State DOT/FRA Bridge/Structure Assessment Forms (FHWA/FRA, 2018, Appendix D) were completed in the Arc Collector application for each bridge or bridge/ramp combination as listed in **Table 1**. Data collected included associated waterbody or road crossing, federal structure ID, date and time of inspection, names of inspectors, county, and any documented evidence of the presence of bats. The forms also provide a checklist of types of potential bat roosting habitat present for each bridge, including:

- All vertical crevices sealed at the top that are 0.5-1.25” wide and ≥ 4 ” deep
- All crevices > 12 ” deep and not sealed
- All expansion joints
- Spaces between concrete end walls and the bridge deck

Completed data forms are included in **Appendix B**. Photographs were also taken of each assessed bridge, including shots looking at each bridge abutment and from each bridge abutment toward the bridge piers. These are included in a photographic log in **Appendix C**. Other representative photographs were taken of suitable crevices or expansion joints as appropriate. Photographic documentation was also provided for any observed bats or bat evidence, such as guano or staining. Photographs of the evidence of roosting bats are included in a separate photographic log included in **Appendix D**.

Results and Discussion

During the visual bridge assessments, one (1) bridge was found to have evidence of bat use – the same bridge as in 2019; however, there was no visual evidence of use of the bridges by the Northern Long-eared Bat or the Indiana Bat. Two (2) big brown bats were observed solitarily roosting in two (2) separate gaps between the pier caps of the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010) (See Photos 5-6 in **Appendix D**). The small amount of guano found below each of the cracks with roosting bats (Photos 1-4, **Appendix D**) indicates that this is not likely a permanent or high frequency roosting location. This bridge shared several of the characteristics of bridges that are used as roosts by bats: the roosts were concrete, located between 10 and 20 feet off the ground, had vertical cracks that were more than 12 inches in depth, and were located near a contiguous tract of forest and water resources. The gaps between pier caps that the bats were using as roosts were about one to two inches wide and more than 12 inches in depth. Some cracks were not sealed at the top, however, they were protected from the elements by the bridge deck.

Bats are more likely to be found roosting on bridges constructed of concrete that have vertical, sealed crevices approximately 0.5 to 1.25 inches wide, more than 12 inches deep, more than 10 feet from the ground, and have low traffic volumes (Keeley and Tuttle 1999, Hendricks et. al 2005, Bektas et al. 2018). Of the eight (8) structures and associated ramps surveyed, most had metal I-beams and decking. While all bridges had concrete abutments, most cracks from flaking concrete and the gap at the junction of the bridge deck and abutment were very low to the ground, less than four feet in most cases. Most of the bridges surveyed had some areas with cracked or sealed crevices in concrete structures that could provide suitable roosting habitat for bats. However, potential limitations of these bridges as favorable roosts for bats are the degree of shelter from the elements, the height of ground clearance, intensity of disturbance from vehicular or human traffic both above and under the bridge, stability of thermal regimes, and protection from predators.

Bridges with crevices that are not sealed or that are completely sealed are unlikely to be used as a roost for bats. Metal structures generally do not provide as much thermal buffering as concrete structures (Civjan 2017, Erickson et al. 2002, Kaarakka 2017). Bridges with concrete abutments that can be accessed by potential predators, such as snakes and raccoons, are also unlikely to provide suitable roost habitat. Several of the surveyed bridges had evidence of snakes and raccoons.

The visual survey was limited to areas that could be safely or practically accessed. Most pier caps and expansion joints or cracks over pier caps could not be surveyed because they could not be accessed. Some areas at the bridge abutments could not be accessed because they were in hard to reach areas or other structures such as pipes or flakes of broken concrete obstructed the view. Many bridges had wood and metal platforms under the decks that precluded view of I-beams, under-decking, and pier-cap and expansion joint surfaces. The Suitland Parkway bridges (160015/160016) were still under construction at the time of the survey; however, as noted above, it was possible to conduct the survey in 2020 unlike in 2019, because the undersides of the bridge spans were exposed. The Suitland Parkway bridges are similar to the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010) in both construction style and setting, so it

may be able to support roosting bats, though with ongoing construction it is less likely that bats would choose to roost on these bridge spans at least until after construction is complete.

Conclusions

On June 29, 2020, two surveyors assessed eight (8) bridge structures and associated ramp bridges within the CSB. The Suitland Parkway bridges were under construction at the time of survey, but were still able to be assessed. Assessed bridges were those that occurred within 1,000 feet of suitable bat habitat or were near locations where either NLEB or IB were detected during a study by researchers from Virginia Tech. While suitable bat roosting habitat features were present on most bridges, most did not combine all necessary habitat variables. Bat guano was not found at any structure other than the McArthur Boulevard/Clara Barton Parkway Westbound bridge where bats were discovered roosting during the 2019 surveys. Based on the results of the visual assessment, there was no evidence of use of the bridges by the northern long-eared bat or the Indiana bat. However, two (2) Big Brown Bats, not state or federally listed, were found day-roosting singly within gaps between pier caps of the McArthur Boulevard/Clara Barton Parkway Westbound bridge. Both roosting bats were in locations with a vertical clearance of at least 10 feet and with forested habitat adjacent to the bridge. Both had small amounts of guano on the ground beneath them suggesting that these were not extensively used roosts.

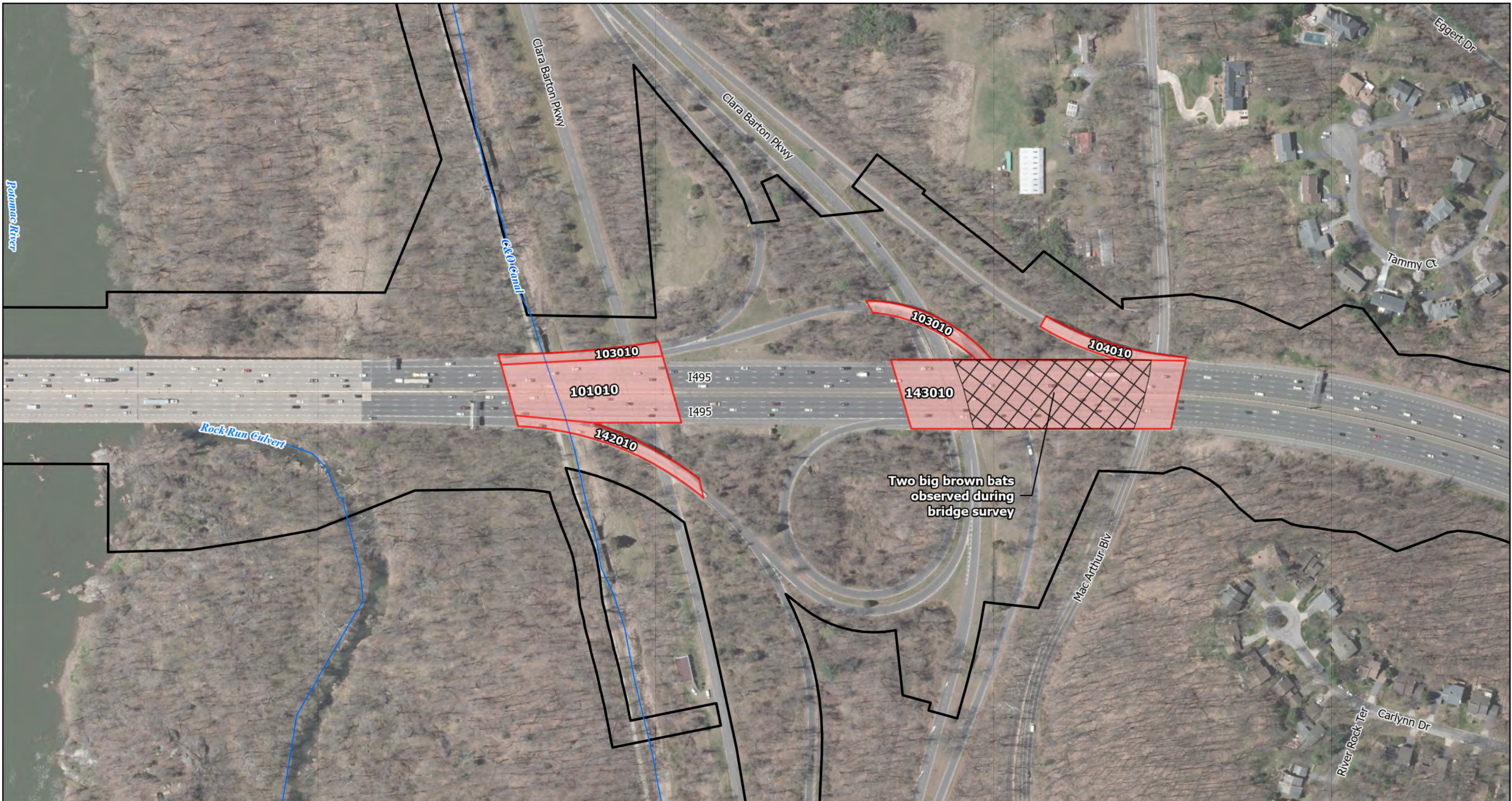
Based on suitable conditions for bridge roosting reported in the literature and evidence of roosting bats from this study, CSB bridges that support or could support roosting bats include the McArthur Boulevard/Clara Barton Parkway Westbound bridge and the Suitland Parkway bridges. Prior to construction, follow-up surveys of these bridges should be conducted to determine the potential presence of roosting bats, or time of year restrictions should be imposed to initiate construction when bats would be hibernating away from the project area.

References

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Appendix A

Bridge Bat Survey Maps

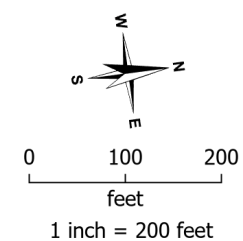


Bat Bridge Visual Survey **1-495/I-270 Managed Lanes Study**

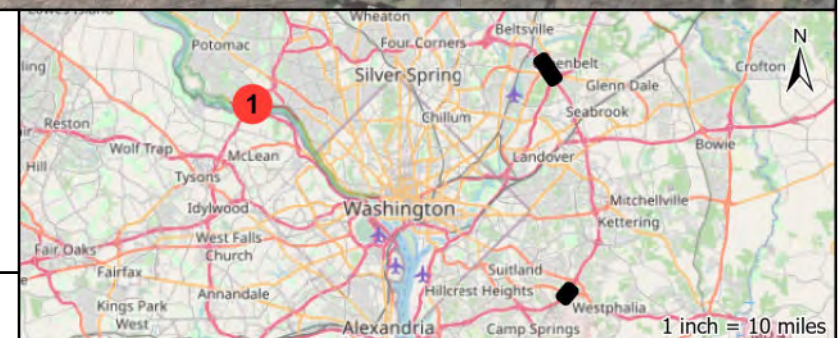
Appendix A:
 Sheet 1 of 4

Montgomery and Prince George's Counties, MD
 Fairfax County, VA
 October 2020

- Corridor Study Boundary
- NHD Stream
- Bridges Surveyed
- Bridge Under Construction at Time of Bridge Survey
- Big Brown Bat Day Roost



Map Center, NAD83
 38.9734°, -77.1787°








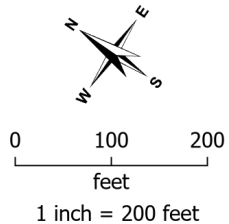


Bat Bridge Visual Survey
1-495/I-270 Managed Lanes Study

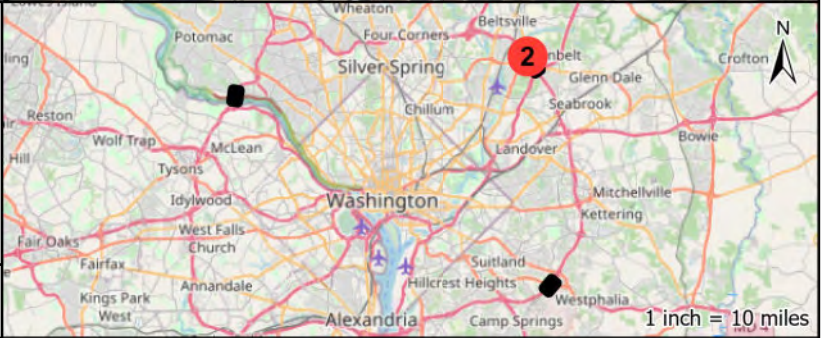
Appendix A:
Sheet 2 of 4

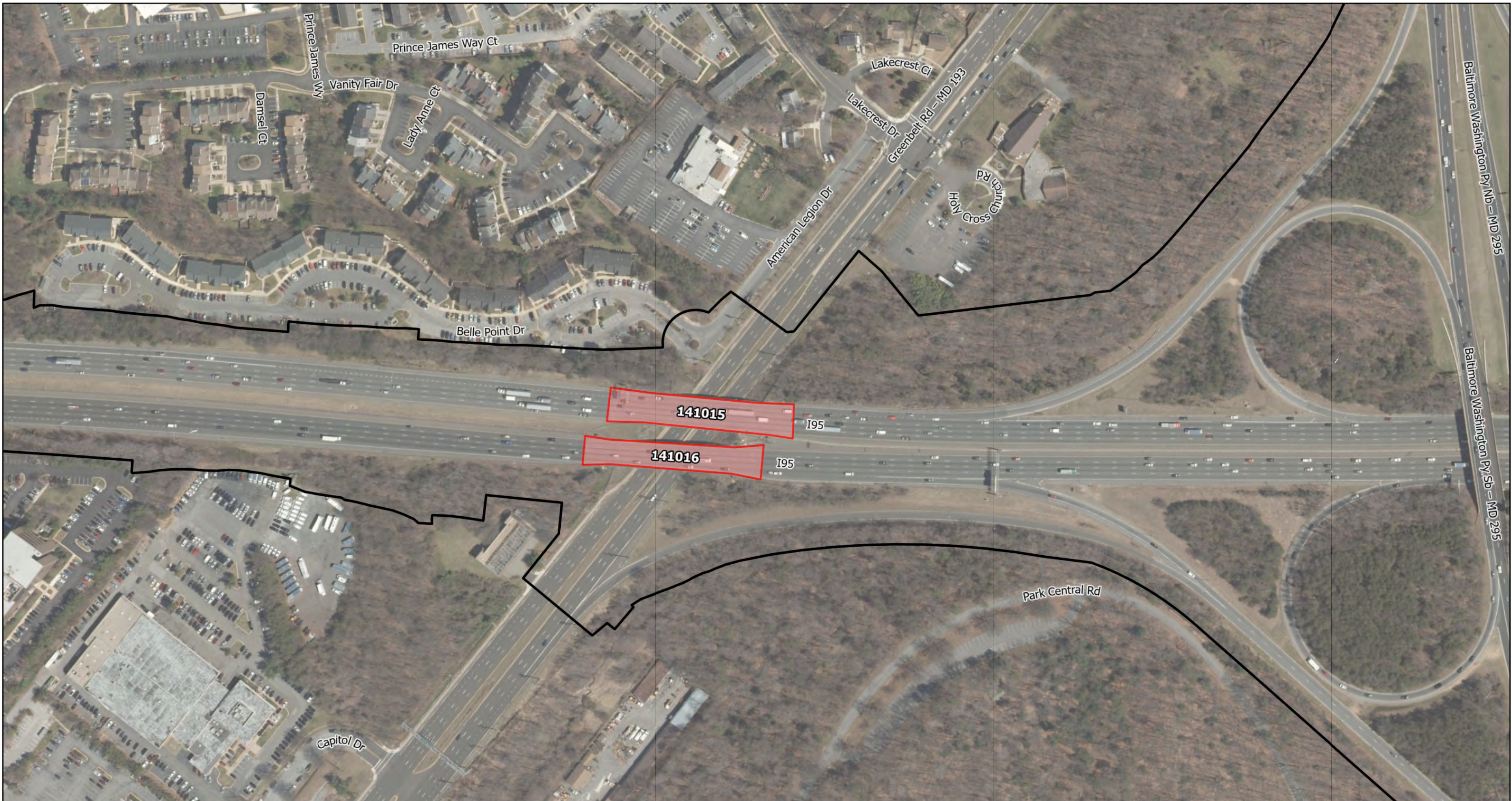
Montgomery and Prince George's Counties, MD
Fairfax County, VA
October 2020

-  Corridor Study Boundary
-  NHD Stream
-  Bridges Surveyed
-  Bridge Under Construction at Time of Bridge Survey
-  Big Brown Bat Day Roost



Map Center, NAD83
39.0034°, -76.8955°



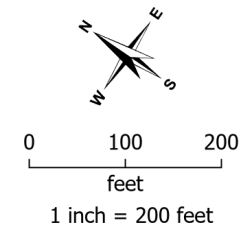


Bat Bridge Visual Survey **1-495/I-270 Managed Lanes Study**

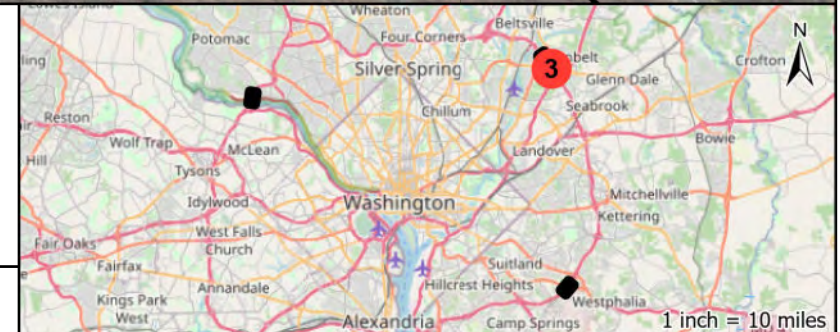
Appendix A:
 Sheet 3 of 4

Montgomery and Prince George's Counties, MD
 Fairfax County, VA
 October 2020

- Corridor Study Boundary
- NHD Stream
- Bridges Surveyed
- Bridge Under Construction at Time of Bridge Survey
- Big Brown Bat Day Roost



Map Center, NAD83
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





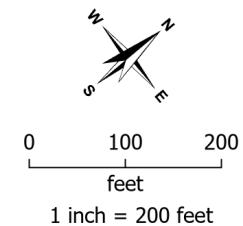


Bat Bridge Visual Survey **1-495/I-270 Managed Lanes Study**

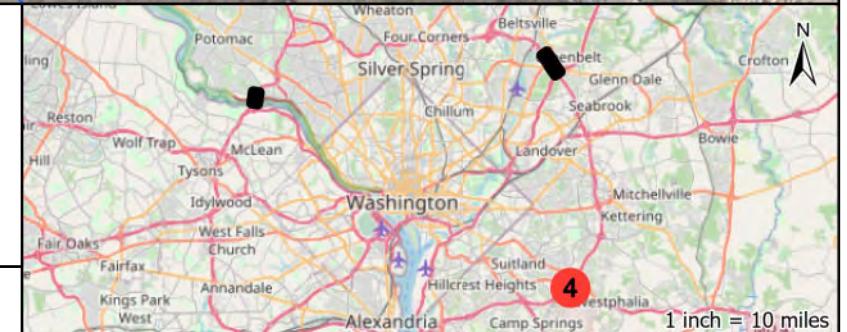
Appendix A:
 Sheet 4 of 4

Montgomery and Prince George's Counties, MD
 Fairfax County, VA
 October 2020

-  Corridor Study Boundary
-  NHD Stream
-  Bridges Surveyed
-  Bridge Under Construction at Time of Bridge Survey
-  Big Brown Bat Day Roost



Map Center, NAD83
 38.8303°, -76.8741°



Appendix B

Bridge Survey Data Forms

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road C&O Canal & Clara Barton Pkwy	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 10:30
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 S. Abut. & Span	Montgomery	101010	N	N	N	N	
I-495 N. Abut. & Span	Montgomery	101010	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: Potential netting corridor near south abutment. North Abutment too tall to access, so could not see if there were bats or evidence of bats.					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road C&O Canal & Clara Barton Pkwy	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 10:50
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 N Off Ramp N. Abut. & Span	Montgomery	142010	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes:					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road Clara Barton Pkwy & MacArthur Blvd	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 11:11
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 S. Abut. & Span	Montgomery	143010/ 104010	N	N	N	N	
I-495 N. Abut. & Span	Montgomery	143010/ 104010	Y	N	Y	N	2 Big Brown Bats roosting in gaps between pier caps. Guano observed under several pier cap gaps as well as other locations

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes:					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road Clara Barton Pkwy	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 11:21
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
CB Pkwy - I-495 S On Ramp S. Abut. & Span	Montgomery	103010	N	N	N	N	
CB Pkwy - I-495 S On Ramp N. Abut. & Span	Montgomery	103010	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes:					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road MacArthur Blvd	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 11:09
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 S Off Ramp S. Abut. & Span	Montgomery	143010	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes:					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road I-495	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 12:40
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
Kenilworth Ave N SW Abut. & Span	Prince George's	140011	N	N	N	N	
Kenilworth Ave N NE Abut. & Span	Prince George's	140011	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: No gap between deck and abutment.					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road I-495	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 12:36
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
Kenilworth Ave S SW Abut. & Span	Prince George's	140012	N	N	N	N	
Kenilworth Ave S NE Abut. & Span	Prince George's	140012	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: No gap between deck and abutment. Deck is < 3ft above ground at abutment					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road Greenbelt Rd	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 13:14
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 Inner N. Abut. & Span	Prince George's	141016	N	N	N	N	
I-495 Inner S. Abut. & Span	Prince George's	141016	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: No gap between deck and abutment wall on either side of bridge.					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road Greenbelt Rd	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 13:03
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 Outer N. Abut. & Span	Prince George's	141015	N	N	N	N	
I-495 Outer S. Abut. & Span	Prince George's	141015	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: North abutment: wood cross beams obscure view of abutment-deck junction. South abutment: No gap between deck and abutment wall					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road Suitland Pkwy	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 14:58
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 Inner NE Abut. & Span	Prince George's	160016	N	N	N	N	
I-495 Inner SW Abut & Span.	Prince George's	160016	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: Bridge under construction but abutments open. Potential netting corridor under bridge.					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Bridge/Structure Assessment Form

DOT Project #	Water Body/Road Suitland Pkwy	Assessment Conducted By J. Saville, K. Stohlgren	Date/Time of Inspection 6/29/2020 15:15
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Route:	County:	Federal Structure ID:	Bat Indicators (Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.)				
			Visual	Sound	Droppings	Staining	Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
I-495 Outer NE Abut. & Span	Prince George's	160015	N	N	N	N	
I-495 Outer SW Abut & Span.	Prince George's	160015	N	N	N	N	

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures		Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & ≥4" deep	✓	Crevices, rough surfaces or imperfections in concrete		Human disturbance or traffic under bridge/in culvert or at the structure	High	Low	None
All crevices >12" deep & not sealed	✓	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	NA			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	✓	Additional Notes: Bridge under construction but abutments open. Deck ~3 ft. above ground at abutment. No space between abutment & deck. Potential netting corridor under bridge.					
Spaces between concrete end walls and the bridge deck	✓						
Vertical surfaces on concrete I-beams	NA						

Appendix C

Bridge Survey Photo Log

Appendix C – Bridge Survey Photo Log



Photo 1: Clara Barton Parkway East Bridge (101010/142010/103010) - Looking at south abutment.



Photo 2: Clara Barton Parkway East Bridge East (101010/142010/103010) - Looking north at piers.

Appendix C – Bridge Survey Photo Log



Photo 3: Clara Barton Parkway East Bridge West Off Ramp (142010) - Looking at north abutment.



Photo 4: Clara Barton Parkway East Bridge West Off Ramp (142010) - Looking south at piers.

Appendix C – Bridge Survey Photo Log



Photo 5: Clara Barton Parkway East Bridge (101010/103010) - Looking at north abutment.



Photo 6: Clara Barton Parkway East Bridge (101010/103010) - Looking south at piers.

Appendix C – Bridge Survey Photo Log



Photo 7: Kenilworth Avenue North (140011) - Looking at southwest abutment.



Photo 8: Kenilworth Avenue North (140011) - Looking northeast at southwest abutment piers.

Appendix C – Bridge Survey Photo Log



Photo 9: Kenilworth Avenue North (140011) - Looking northeast at piers.



Photo 10: Kenilworth Avenue North (140011) - Looking at northeast abutment.

Appendix C – Bridge Survey Photo Log



Photo 11: Kenilworth Avenue North (140011) - Looking southwest at piers.



Photo 12: Kenilworth Avenue South (140012) - Looking at southwest abutment.

Appendix C – Bridge Survey Photo Log



Photo 13: Kenilworth Avenue South (140012) - Looking northeast at southwest abutment piers.



Photo 14: Kenilworth Avenue South (140012) - Looking northeast at piers.

Appendix C – Bridge Survey Photo Log



Photo 15: Kenilworth Avenue South (140012) - Looking at northeast abutment.



Photo 16: Kenilworth Avenue South (140012) - Looking southwest at piers.

Appendix C – Bridge Survey Photo Log



Photo 17: Greenbelt Road Inner Loop (141016) - Looking at northwest abutment.



Photo 18: Greenbelt Road Inner Loop (141016) - Looking southeast at piers.

Appendix C – Bridge Survey Photo Log



Photo 19: Greenbelt Road Inner Loop (141016) - Looking at southeast abutment.



Photo 20: Greenbelt Road Inner Loop (141016) - Looking northwest at piers.

Appendix C – Bridge Survey Photo Log



Photo 21: Greenbelt Road Outer Loop (141015) - Looking at northwest abutment.



Photo 22: Greenbelt Road Outer Loop (141015) - Looking southeast at piers.

Appendix C – Bridge Survey Photo Log



Photo 23: Greenbelt Road Outer Loop (141015) - Looking at southeast abutment.



Photo 24: Greenbelt Road Outer Loop (141015) - Wooden braces obscure view of and access to the northwest abutment wall.

Appendix C – Bridge Survey Photo Log



Photo 25: Greenbelt Road Outer Loop (141015) - Looking northwest at piers.



Photo 26: Suitland Parkway Inner Loop (160016) - Looking at northeast abutment.

Appendix C – Bridge Survey Photo Log



Photo 27: Suitland Parkway Inner Loop (160016) - Looking southwest at piers. Gaps between pier caps may provide roosting locations for bats.



Photo 28: Suitland Parkway Inner Loop (160016) - Looking at southwest abutment.

Appendix C – Bridge Survey Photo Log



Photo 29: Suitland Parkway Inner Loop (160016) - Looking northeast at piers. Gaps between pier caps may provide roosting locations for bats.



Photo 30: Suitland Parkway Outer Loop (160015) - Looking at northeast abutment.

Appendix C – Bridge Survey Photo Log



Photo 31: Suitland Parkway Outer Loop (160015) - Looking southwest at piers. Gaps between pier caps may provide roosting locations for bats.



Photo 32: Suitland Parkway Outer Loop (160015) - Looking at southwest abutment.

Appendix C – Bridge Survey Photo Log



Photo 33: Suitland Parkway Outer Loop (160015) - Looking northeast at piers. Gaps between pier caps may provide roosting locations for bats.

Appendix D

Bat Evidence Photo Log

Appendix D – Bat Evidence Photo Log



Photo 1: Bat guano below gap between pier caps where bat is roosting in the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).



Photo 2: Bat guano below gap between pier caps where bat is roosting in the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).

Appendix D – Bat Evidence Photo Log



Photo 3: Bat guano below gap between pier caps where bat is roosting in the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).



Photo 4: Bat guano below gap between pier caps where bat is roosting in the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).

Appendix D – Bat Evidence Photo Log



Photo 5: Big brown bat individual AD found in gap between pier caps of the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).



Photo 6: Big brown bat individual B found in gap between pier caps of the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).

Appendix D – Bat Evidence Photo Log



Photo 7: Representative photo of gaps between pier caps where bats were observed roosting in the McArthur Boulevard/Clara Barton Parkway Westbound bridge (104010/143010).



Supplemental Draft Environmental Impact Statement and Updated Draft Section 4(f) Evaluation

APPENDIX H

THREATENED AND ENDANGERED BAT HABITAT ASSESSMENT AND ACOUSTIC SURVEY REPORT



Threatened and Endangered Bat Habitat Assessment and Acoustic Survey Report

December 16, 2020



U.S. Department of Transportation
Federal Highway Administration

and



MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION



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Appendix C	Habitat Assessment Data Sheets
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Appendix F	ERM Vetting Key
Appendix G	Myotis Vetting Spreadsheets
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Appendix I	Site Coordinates



1 INTRODUCTION

The Federal Highway Administration (FHWA), as the Lead Federal Agency, and the Maryland Department of Transportation State Highway Administration (MDOT SHA), as the Local Project Sponsor, are preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for the I-495 & I-270 Managed Lanes Study (MLS). The purpose of the MLS is to develop a travel demand management solution that addresses congestion and improves trip reliability on I-495 and I-270 within the Study limits and enhances existing and planned multi-modal mobility and connectivity (**Figure 1-1**).

As part of the MLS, six DEIS Build Alternatives (Alternatives 8, 9, 9M, 10, 13B, and 13C) are proposed and were presented in the DEIS. For further information on DEIS Build Alternatives see Chapter two of the DEIS, the *MLS Alternatives Technical Report (ATR)*, and the *MLS Natural Resources Technical Report (NRTR)*. The affected counties in Maryland include Montgomery and Prince George's and Fairfax County in Virginia.

The United States Fish and Wildlife Service (USFWS) Chesapeake Bay Field Office is the federal agency overseeing MLS compliance with Section 7 of the Endangered Species Act for federally listed threatened and endangered (T&E) bat species. Section 7 consultation is required when any action a federal agency carries out, funds, or authorizes may affect a listed endangered or threatened species.

The MLS study corridors are located within the Washington D.C. Metropolitan Area and include fragmented forested habitat. The Indiana bat (*Myotis sodalis*) is currently listed as Endangered in the state of Maryland both by the state and federally and falls under the jurisdiction of the USFWS and the Maryland Department of Natural Resources (MDNR). The Northern Long-Eared bat (*Myotis septentrionalis*) falls under the jurisdiction of the USFWS and MDNR and is currently listed as Threatened by both agencies. In Virginia, the Indiana bat is federally and state listed as Endangered and the Northern Long-Eared bat is federally and state-listed as Threatened.

FHWA and MDOT SHA have coordinated closely with the USFWS in 2019 and 2020 for informal MLS Section 7 Consultation. As part of this coordination, Rummel, Klepper, & Kahl (RK&K) completed the *I-495 & I-270 Managed Lanes Study Acoustic Surveys Technical Study Plan for Threatened and Endangered Bat Species*. The study plan (**Appendix A**) was approved by the USFWS on June 10, 2020 and was used as a framework to conduct habitat and acoustic surveys for threatened and endangered bat species within the study area in spring/summer 2020. The following report summarizes methodologies and results for the aforementioned surveys.

Figure 1-1: MLS Corridor



2 METHODOLOGY

I. Habitat Assessment

A T&E bat habitat assessment evaluation of the MLS potential limits of disturbance (LOD) associated with the DEIS alternatives was performed by a USFWS Qualified Bat Surveyor (QBS) from RK&K. Due to the geographic location/urbanization of the study corridors, the potential for large tracts of suitable habitat was low. The following section outlines the main components of the proposed bat habitat assessment. **Appendix B** depicts the MLS study area. Habitat assessment data sheets are provided in **Appendix C**.



A. GIS Analysis

RK&K completed a Geographic Information System (GIS) desktop review of the MLS study corridors, identifying forested habitat components and forested areas 15-acres and larger. The GIS forest layer was developed based on desktop review of the Chesapeake Conservancy Conservation Innovation Center's High-Resolution Land Cover Data for tree canopy cover. In the Virginia portion of the corridor study boundary, the aerial extent of vegetation cover was identified using GIS data obtained from the Virginia Department of Forestry (VDOF) 2005 Virginia Forest Cover dataset. The desktop review was the first component of a multi-phased habitat assessment. The MLS is considered a linear project as it relates to the threatened and endangered (T&E) bat species survey protocols. Using this standard approach, total suitable summer habitat was determined by GIS desktop review, field evaluation and Appendix F (Linear Project Guidance) of the USFWS 2020 Survey Guidelines. Forest segments that were determined by desktop review to be suitable habitat were compiled for field evaluation.

B. Field Evaluation

The GIS desktop habitat evaluation was augmented by a field evaluation effort. The field evaluation effort associated with the bat habitat assessment verified preliminary desktop information collected regarding forest land and potential hibernacula. The forested components were qualitatively evaluated for potential use by threatened and endangered bat species. Based on best professional judgment and the evaluation of potential bat habitat by RK&K, forested components of the MLS LODs were classified into three forest habitat types (FHTs): Forest Habitat Type 1 (FHT 1), Forest Habitat Type 2 (FHT 2), and Forest Habitat Type 3 (FHT 3). The FHTs within the LODs are characterized by the following:

- FHT 1 is more likely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas include suitable habitat for T&E bat species.
- FHT 2 is less likely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas include suitable habitat for T&E bat species.
- FHT 3 is unlikely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas do not include suitable habitat for T&E bat species

FHT-1 - This habitat type is more likely to be used as roosting, travel and foraging habitat by T&E bats due to its forest characteristics. This FHT typically includes a mixed-age deciduous hardwood forest with plenty of pole stage and mature hardwoods. The understory is open and has moderate to no shrub layer or a moderate understory with travel corridors and forage areas including trails, forest openings, and nearby waterways. Dominant tree species may include: live and dead or dying red maple (*Acer rubrum*), sugar maple (*A. saccharum*), shagbark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), black locust (*Robinia pseudoacacia*), and willow (*Salix sp.*). Potential roost locations are plentiful in this FHT. Tree/snag physical location, bark condition, and topographic setting is more crucial to consideration as bat habitat than tree species within this habitat type.

FHT-2 - This habitat type is less likely to be used as roosting, travel, and foraging habitat by T&E bats due to its forest characteristics, however; FHT-2s still may be used by T&E bats in some capacity. The existing timber typically includes mixed-age deciduous hardwood sapling stage to immature timber but includes a moderate to dense shrub layer and the forest may be disturbed or manipulated. The understory includes a moderate to dense shrub layer, with few travel corridors, forage areas, and nearby waterways. Potential roost sites are not as readily available in this habitat type as in FHT-1. Dominant tree and shrub species identified within FHT-2 may include red maple, sugar maple, tree of heaven (*Ailanthus altissima*), hawthorn (*Crataegus* sp.), American beech, Norway spruce (*Picea abies*), black cherry, white oak, black locust and elm (*Ulmus* sp.). Understory would be dominated by spicebush (*Lindera benzoin*), honeysuckle (*Lonicera* spp.), multiflora rose (*Rosa multiflora*), blackberry (*Rubus* sp.), poison ivy (*Toxicodendron radicans*), and grape vine (*Vitis* sp.) or similar species. Tree/snag physical location, bark condition, and topographic setting is more crucial to consideration as bat habitat than tree species.

FHT-3 - This habitat type is unlikely to be used by T&E bats due to its forest characteristics. The existing timber includes deciduous hardwood sapling stage timber. The understory includes a dense shrub and vine layer and the forest is highly-disturbed, manipulated, and/or fragmented. Roost sites are not readily available, nor are travel corridors, forage areas, or nearby waterways. In these areas, common species identified included honeysuckle, multiflora rose, black locust, blackberry, sumac (*Rhus typhina*), poison ivy, and grape vine.

The classifications resulting from the habitat assessment were utilized to determine the total acoustic survey effort for the MLS. RK&K utilized FHT 1 and FHT 2 habitat area lengths when calculating the total suitable habitat length for the project. These results would determine the number of acoustic survey sites for the study area and acoustic survey sites were located in FHT 1 and 2 habitat areas.

In addition to habitat characterization, RK&K evaluated the study area for potential bat hibernacula. RK&K coordinated with field staff regarding MLS-specific field features previously identified within the LOD.

II. Acoustic Survey

As outlined within the approved study plan for the MLS project, an acoustic bat survey to determine presence/absence of T&E bat species within the study area was conducted during the 2020 Indiana bat survey season (May 15th-August 15th). Sampling was performed in accordance with the USFWS survey protocol, *Range-wide Indiana Bat Summer Survey Guidelines, 2020*. The MLS study corridors are located in the Washington D.C. Metropolitan Area, spanning 48-miles, including portions of Prince George's and Montgomery Counties in Maryland and Fairfax County in Virginia, and the MLS is considered "linear" as it relates to the USFWS *Indiana Bat Survey Protocols*. Each acoustic survey site was located within suitable forested habitat areas FHT-1 and FHT-2 and was surveyed using USFWS guidelines.

The level of effort for the acoustic survey was based on the USFWS 2020 Survey Guidelines. The USFWS guidance recommends a minimum of two detector nights of effort per 1 kilometer (0.6 mile) of suitable habitat. The results of the aforementioned habitat assessment determined the total number of acoustic survey sites for the MLS. Monitoring locations were selected by an RK&K qualified bat biologist for

likelihood of use and habitat characteristics most likely to provide clear, identifiable bat calls and are identified on the Bat Acoustic Survey Map in **Appendix A**. Monitoring locations are spatially distributed to maximize coverage of suitable habitat identified. Attempts were made to identify a potential survey location within each kilometer of suitable habitat. Preliminary review of the suitable habitat areas within the study area identified approximately 66 kilometers of suitable habitat. This resulted in a minimum of 132 detector nights of survey for the project and 66 detector locations. Survey site datasheets are included in **Appendix D** and a photographic log of detector locations is included in **Appendix E**.

The survey occurred during the 2020 Indiana bat survey season (May 15th-August 15th) and began in June, it continued until its conclusion in July 2020. RK&K provided survey crews of qualified biologists for the selection of survey locations and bat detector placement. The best acoustic survey locations were selected in the field based on best professional judgement by a USFWS approved Qualified Bat Surveyor (QBS). Detectors were placed in areas where bats would be expected to be foraging, traveling, or drinking. The *I-495 & I-270 Managed Lanes Study Draft Technical Study Plan - Acoustic Surveys - Threatened and Endangered Bat Species - Indiana bat (*Myotis sodalis*) and Northern long-eared bat (*Myotis septentrionalis*)* included survey site locations that were agreed upon with USFWS. All sites included minor field adjustments and some sites required significant field adjustments to maximize the potential for recording quality bat calls. All adjusted locations remained within the designated kilometer segments to adhere to USFWS spacing protocols. **Appendix I** provides GPS coordinates and site survey information.

Wildlife Acoustics SM4 passive acoustic monitoring devices were used to survey selected locations. Weatherproof omni-directional ultrasonic microphones were used in combination with the acoustic units. Microphones were mounted to the ends of aluminum or steel poles and were positioned atop iron rebar spikes for stability. The microphones were oriented parallel with the ground towards potential roosting habitat areas (i.e., forested areas) or potential foraging/travel habitat. All units were tested in the field for proper functionality prior to the start of the survey. Specifications for the unit settings are provided in **Appendix D**. During the survey, previous night data and verification of all unit settings were confirmed prior to deployment. If unexpected results were recorded, (minimal calls, no calls) the unit settings were confirmed, and the survey night was repeated. All unit settings and functionality were verified when units were moved to the next survey locations. All sites included minor field adjustments and some sites required significant field adjustments to maximize the potential for recording quality bat calls. All adjusted locations remained within the designated kilometer segments to adhere to USFWS spacing protocols. For any sites that displayed few or no calls, site weather conditions were reviewed, bat detector unit settings were verified, and survey nights were added. The following sites had added nights due to weather of detector malfunction: 3A, 8, 12, 13, 13A, 14, 15, 16, 18A, 26, X2, and X5.

Each acoustic survey location was surveyed at least twice over the course of the survey period. All recordings were completed in full-spectrum mode and the appropriate Kaleidoscope® Pro (Wildlife Acoustics, Inc.) acoustic identification software was used to provide verification on species identification per the USFWS 2020 Survey Guidelines. A USFWS/USGS approved version of Kaleidoscope® Pro, version 5.1.0, was chosen for the automated ID process. Qualitative call analysis (manual vetting) was conducted by a trained RK&K bat biologist to verify calls of potential T&E bat species.

To provide further clarification of the acoustic survey locations, the following bridge locations were surveyed via acoustic techniques for bats:

- 1) American Legion Bridge over the Potomac River;
- 2) I-495 Bridge over the NW Branch of the Anacostia River;
- 3) MacArthur Boulevard/Clara Barton Parkway Westbound bridge (due to guano presence); and
- 4) Seven Locks Road bridge (due to guano presence).

A. Bat Call Analysis

Bat call data was recorded in the field at 70 locations using Wildlife Acoustics SM4 passive acoustic monitoring devices and weatherproof omni-directional ultrasonic microphones in accordance with the USFWS survey protocol, *Range-wide Indiana Bat Summer Survey Guidelines, March 2020*. The acoustic monitoring devices record all bat calls, including those of the target species identified by USFWS and MDNR for the 2020 MLS Acoustic Bat Survey: Indiana bats (*Myotis sodalis*), Northern Long Eared Bats (*Myotis septentrionalis*), and small footed myotis (*Myotis leibii*), a Maryland state-listed Endangered species.

The recorded call data was downloaded daily and saved in site-specific folders. The call files were then processed using Kaleidoscope® Pro version 5.1.0 (Wildlife Acoustics, Inc.) acoustic identification software for automatic identification (ID). Each site's individual nightly recorded data was processed individually.

A trained RK&K biologist (Ryan Leiberher) then reviewed the automated ID results for each site and survey night. In this vetting process, all *Myotis* sp. calls ("*Myotis* vetting") were identified in the dataset and automated IDs of Indiana bats (*Myotis sodalis*), Northern Long-Eared Bats (*Myotis septentrionalis*), and the Little Brown bat (*Myotis lucifugus*) were noted. An Excel tracking spreadsheet was created identifying all survey locations with *Myotis* sp. bat calls, including *Myotis sodalis*, *Myotis lucifugus*, and *Myotis septentrionalis*. To aid in the vetting process a flowchart/ key was utilized and is included in **Appendix F**. The tracking sheets are provided in **Appendix G**. A trained RK&K biologist conducted a rigorous analysis of the P-value in combination with characteristic frequency (Fc) and characteristic slope (Sc) values on this focused *Myotis* dataset. *Myotis lucifugus* was included in the analysis due to bat call similarities with *Myotis sodalis*.

3 RESULTS

I. Habitat Assessment

Desktop and field habitat assessment identified 66 kilometers of linear distance with suitable T&E bat habitat. See **Appendix B** for depictions of the final habitat classifications for the MLS project.

II. Acoustic Survey

Acoustic survey was conducted at 70 detector locations for 142 detector nights, exceeding the minimum number survey nights and locations. See **Appendix B** for depictions of the final detector locations for the MLS project. During the survey 54,700 bat calls were recorded.

Presence Confirmation- P-Value Analysis

The Kaleidoscope® Pro software provides P-values as an output, which reflect how close a particular bat call is to the reference call for a particular species. USFWS protocol designates a P-value of 0.05 or less as an indicator of presence for T&E bat species in the analysis of automated bat calls using this identification software. Sites with P-values indicating presence are identified on the attached mapping (**Appendix B**) and accompanying spreadsheet (**Table 1**). Two acoustic survey sites, Sites 18 and 24A, have P-values indicating presence for the Northern Long-eared Bat, *Myotis septentrionalis*. A third site, Site X4, has a P-value of 0.06 and combined characteristic frequency (Fc) and characteristic slope (Sc) values that indicate presence of *Myotis septentrionalis*, in the opinion of RK&K biologists. Specific call information is provided in **Table 3**. No P-values indicating presence of the Indiana Bat, *Myotis sodalis*, or small footed *Myotis* (*Myotis leibii*) were identified for the project. Site analysis that resulted in P-values of 1 indicated absence of T&E species at those sites. More detailed data associated with the analysis is provided in **Appendix G**.

Table 1: Northern Long Eared Bat Presence

Table 1																	
DATE	AUTO ID*	PULSES	Fc	Sc	Dur	Fmax	Fmin	Fmean	TBC	Fk	Tk	S1	Tc	Qual	FILES	Site	Night
Wildlife Acoustics KALEIDOSCOPE 5.1.0																	
Site 18																	
7/9/2020 MYOSEP		12	37.846	170.53	3.178	60.827	35.046	44.589	140.191	42.205	1.898	401.96	2.71	4.15		1	1
7/9/2020 MYOSEP		6	36.939	99.66	3.643	64.049	35.917	46.348	164.182	40.054	2.637	438.08	3.493	1.59		1	1
Site X4																	
6/19/2020 MYOSEP		8	35.676	241.74	3.519	68.986	32.785	45.287	104.557	42.504	1.89	531.3	2.994	1.29		1	2
Site 24A																	
6/24/2020 MYOSEP		6	35.126	193.82	2.464	53.087	32.781	40.507	86.29	40.52	1.268	472.62	2.141	1.42		1	2

4 CONCLUSION

As outlined within the approved study plan for the MLS project, an acoustic bat survey to determine presence/absence of T&E bat species within the study area was conducted during the 2020 Indiana bat survey season (May 15th-August 15th). Sampling was performed in accordance with the USFWS survey protocol, *Range-wide Indiana Bat Summer Survey Guidelines, 2020*. The survey resulted in the recording of 54,700 bat calls at 70 sites. Three of these sites had calls identified as Northern Long eared bats (*Myotis septentrionalis*). No Indiana bats (*Myotis sodalis*) or small footed bats (*Myotis leibii*) were recorded during the acoustic survey using the aforementioned methods. No potential hibernacula were identified within the study area. Potential roost trees were not identified as part of this survey.



APPENDIX A- APPROVED STUDY PLAN

**I-495 & I-270 Managed Lanes Study
Final Technical Study Plan - Acoustic Surveys
Threatened and Endangered Bat Species
Indiana bat (*Myotis sodalis*) and Northern long-eared bat (*Myotis septentrionalis*)**

INTRODUCTION

The following phased Study Plan presents threatened and endangered (T&E) bat species survey approaches for the I-495 & I-270 Managed Lanes Study (MLS). As part of the scope of services, Rummel, Klepper, & Kahl (RK&K) will require a final plan of study for the MLS upon receiving input from the United States Fish and Wildlife Service (USFWS).

The MLS is considered linear as it relates to the threatened and endangered (T&E) bat species survey protocols. The majority of the Project is located within the vicinity of Washington D.C. and includes fragmented forested habitat. The USFWS Chesapeake Bay Field Office is the lead agency overseeing T&E bat species for this project. The Indiana bat (*Myotis sodalis*) is currently listed as Endangered in the state of Maryland and falls under the jurisdiction of the USFWS and the Maryland Department of Natural Resources (MDNR). The northern long-eared bat (*Myotis septentrionalis*) is currently listed as Threatened by USFWS and MDNR.

TASK 1- HABITAT ASSESSMENT

Background

RK&K has completed a Geographic Information System (GIS) desktop review of the MLS area, identifying forested habitat components and forested areas 15 acres and larger. The GIS forest layer was developed based on desktop review of the Chesapeake Conservancy Conservation Innovation Center's High Resolution Land Cover Data for tree canopy cover. In the Virginia portion of the corridor study boundary, the aerial extent of vegetation cover was identified using GIS data obtained from the Virginia Department of Forestry (VDOF) 2005 Virginia Forest Cover dataset. The desktop review is the first component of a multi-phased habitat assessment. Using this standard approach, total suitable summer habitat will be determined by GIS desktop review, field evaluation and Appendix F (Linear Project Guidance) of the USFWS 2020 Survey Guidelines. Desktop determined forested segments of the project will be compiled and field evaluated for accuracy. The data collected will be compiled and used to determine acoustic survey intensity outlined in Task 2 of the Study Plan. The following outlines the main components of the proposed bat habitat assessment.

Habitat Assessment

A threatened and endangered bat habitat assessment evaluation of the MLS potential limits of disturbance (LOD) associated with the DEIS alternatives is proposed and will be performed by a USFWS Qualified Bat Surveyor (QBS) from RK&K. Due to the geographic location/urbanization of the study corridor, the potential for large tracts of suitable habitat is unlikely. RK&K proposes that the results of Task 1 of the Study Plan be utilized to determine the level of survey effort in Task 2.

The field evaluation effort associated with the bat habitat assessment will verify preliminary desktop information collected regarding forest land and potential hibernacula. The forested components will be qualitatively evaluated for potential use by threatened and endangered bat species. Based on best professional judgment and the evaluation of potential bat habitat by RK&K, forested components of the MLS LODs will be classified into forest habitat types (FHTs): Forest Habitat Type 1 (FHT 1), Forest Habitat Type 2 (FHT 2), and Forest Habitat Type 3 (FHT 3). The FHTs within the LODs will be characterized by the following:

- **FHT 1** is more likely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas include suitable habitat for T&E bat species.
- **FHT 2** is less likely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas include suitable habitat for T&E bat species.
- **FHT 3** is unlikely to be used by threatened/endangered bat species for foraging, roosting, or for travel. These areas do not include suitable habitat for T&E bat species

FHT-1 - This habitat type is more likely to be used as roosting, travel and foraging habitat by T&E bats due to forest characteristics. This FHT typically includes a mixed-age deciduous hardwood forest with plenty of pole stage and mature hardwoods. The understory will be open and have moderate to no shrub layer or a moderate understory with travel corridors and forage areas including trails, forest openings, and nearby waterways. Dominant tree species may include, live and dead or dying red maple (*Acer rubrum*), sugar maple (*A. saccharum*), shagbark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), black locust (*Robinia pseudoacacia*), and willow (*Salix* sp.). Potential roost locations will be plentiful in this FHT. Tree/snag

physical location, bark condition, and topographic setting is more crucial to consideration as bat habitat than tree species.

FHT-2 - This habitat type is less likely to be used as roosting, travel, and foraging habitat by T&E bats due to forest characteristics, however; FHT-2s still may be used by T&E bats in some capacity. The existing timber typically includes mixed-age deciduous hardwood sapling stage to immature timber but includes a moderate to dense shrub layer and the forest may be disturbed or manipulated. The understory includes a moderate to dense shrub layer, with few travel corridors, forage areas, and nearby waterways. Potential roost sites are not as readily available as in FHT-1. Dominant tree and shrub species identified within FHT-2 may include red maple, sugar maple, tree of heaven (*Ailanthus altissima*), hawthorn (*Crataegus* sp.), American beech, Norway spruce (*Picea abies*), black cherry, white oak, black locust and elm (*Ulmus* sp.). Understory would be dominated by spicebush (*Lindera benzoin*), honeysuckle (*Lonicera* spp.), multiflora rose (*Rosa multiflora*), blackberry (*Rubus* sp.), poison ivy (*Toxicodendron radicans*), and grape vine (*Vitis* sp.) or similar species. Tree/snag physical location, bark condition, and topographic setting is more crucial to consideration as bat habitat than tree species.

FHT-3 - This habitat type is unlikely to be used by T&E bats due to forest characteristics. The existing timber includes deciduous hardwood sapling stage timber. The understory includes a dense shrub and vine layer and the forest is highly disturbed, manipulated, and/or fragmented. Roost sites are not readily available, nor are travel corridors, forage areas, or nearby waterways. In these areas, common species identified included honeysuckle, multiflora rose, black locust, blackberry, sumac (*Rhus typhina*), poison ivy, and grape vine.

The classifications resulting from the Task 1 habitat assessment will be utilized to determine the total acoustic survey effort for the MLS. RK&K recommends that FHT 1 and FHT 2 habitat area lengths be utilized when calculating the total suitable habitat length for the project. These results would determine the number of acoustic survey sites for the study area and acoustic survey sites would be located in FHT 1 and 2 habitat areas.

In addition to habitat characterization, RK&K recommends the study area be assessed for potential bat hibernacula. RK&K will coordinate with field staff regarding MLS-specific field features previously identified within the LOD. Any information regarding potential bat hibernacula (natural cave openings,

mines, or voids) will be included as part of the final report for the MLS. Any hibernacula identified would need to be assessed as part of another field effort specific to bat hibernacula.

TASK 2- ACOUSTICS SURVEY

RK&K proposes to conduct an acoustic bat survey for the MLS. Acoustics is the presence/absence survey method that will be used for the I-495/I-270: Managed Lanes Study. Sampling will be performed in accordance with the USFWS survey protocol, Range-wide Indiana Bat Summer Survey Guidelines, 2020. The MLS study corridor is located in the Washington D.C. Metropolitan Area, spanning 48-miles, including portions of Prince George's and Montgomery Counties in Maryland and Fairfax County in Virginia, and is considered "linear" as it relates to the USFWS Indiana Bat Survey Protocols. Each acoustic survey site would be located within suitable forested habitat areas FHT-1 and FHT-2 and would be surveyed using USFWS guidelines.

USFWS currently identifies the acoustic survey as one of the preferred techniques for evaluating projects that have the potential to affect the Indiana and/or northern long-eared bats. Should an Indiana bat or northern long-eared bat call be identified, further USFWS coordination will be required.

The level of effort for the acoustic survey is based on the USFWS 2020 Survey Guidelines. The USFWS guidance recommends a minimum of two detector nights of effort per 1 kilometer (0.6 mile) of suitable habitat. The results of the aforementioned Habitat Assessment (Task 1) determined the total number of acoustic survey sites for the MLS. Monitoring locations were selected by an RK&K qualified bat biologist for likelihood of use and habitat characteristics most likely to provide clear, identifiable bat calls to the maximum extent practicable and are identified on preliminary project mapping. Monitoring locations are representative of the entire project area and are spatially distributed to maximize coverage of suitable habitat identified. Attempts were made to identify a potential survey location within each KM of suitable habitat. Preliminary review of the suitable habitat areas within the project area have identified approximately 66 kilometers of suitable habitat. This will result in a minimum of 132 detector nights of survey for the project and approximately 66 detector locations.

The survey will occur during the 2020 Indiana bat survey season (May 15th-August 15th). The exact start date of the acoustic surveys is dependent on weather conditions, staff availability, and obtaining concurrence of this study plan from USFWS. Once the survey begins it will continue until its conclusion.

The survey is anticipated to be ongoing for approximately 4 weeks. Both USFWS and the appropriate state agencies will be informed in advance once the survey start date is determined.

RK&K will provide survey crews of qualified biologists for the selection of survey locations and bat call analysis. Wildlife Acoustics SM4 passive acoustic monitoring devices will be used to survey selected locations. Weatherproof omni-directional ultrasonic microphones will be used in combination with the acoustic units. Microphones will be mounted to the ends of ten-foot aluminum or steel poles that will be positioned atop iron rebar spikes for stability. The microphones will be oriented parallel with the ground towards potential roosting habitat areas (i.e., forested areas) or potential foraging/travel habitat. Each acoustic survey location will be surveyed at least twice over the course of the entire survey. All recordings will be completed in full-spectrum mode and the appropriate Kaleidoscope® Pro (Wildlife Acoustics, Inc.) acoustic identification software will be used to provide verification on species identification per the USFWS 2020 Survey Guidelines. A USFWS/USGS approved version of Kaleidoscope® Pro will be chosen for the automated ID process. Currently, versions 4.2.0 & 5.1.0 are approved by USFWS/USG. Qualitative call analysis (manual vetting) will be conducted by a trained RK&K bat biologist to verify calls of potential T&E bat species.

In addition to the acoustic surveys outlined, RK&K proposes additional acoustic survey locations described in the following subsection.

TASK 3- ACOUSTIC SURVEY- Bridge Locations

Previous field assessments within the project area have determined that four bridge locations house existing bat populations. RK&K is recommending these locations be surveyed acoustically for T&E bat species in addition to the remaining forested portions of the project area. Suitable habitat areas anticipated will include these locations:

- 1) American Legion Bridge over the Potomac River; and
- 2) I-495 Bridge over the NW Branch of the Anacostia River
- 3) MacArthur Boulevard/Clara Barton Parkway Westbound bridge (due to guano presence)
- 4) Seven Locks Road bridge (due to guano presence)

RK&K personnel will conduct acoustic monitoring at the aforementioned bridges, to determine the presence or probable absence of the federally threatened northern long-eared bat and federally

endangered Indiana bat. Using this approach and based on existing site conditions, each bridge structure is being considered 1 kilometer of suitable habitat. Therefore, these bridge locations will add an additional 4 acoustic survey locations to the total number of survey locations.

The following four bridges need to be evaluated for bat use during the summer survey season which is from May 15 through August 15. Any of the following bridges that have bat use documented will be added to the acoustic survey using the aforementioned methods.

- Kenilworth Avenue over I-495
- Greenbelt Road under I-495
- Eastbound Clara Barton Parkway (101010/142010)
- Suitland Parkway (160015/160016)

MIST NETTING AND RADIO TELEMETRY

Mist netting surveys and radio telemetry were planned for this bat study but the U.S. Fish and Wildlife Service (Service) asked that we temporarily postpone mist-netting surveys and radio telemetry for the I-495/I-270: Managed Lanes Study due to the potential risks of humans transmitting the COVID-19 virus (SARS CoV-2) to North American bats. If Service guidance on the COVID-19 virus (SARS CoV-2) changes during the 2020 spring/summer survey season, mist netting surveys and radio telemetry will be conducted for the I-495/I-270: Managed Lanes Study under Section 7(a)(1) of the Endangered Species Act which requires Federal agencies to use their authorities to further the conservation of listed species.

Reporting

An electronic PDF copy of the survey report will be prepared and submitted to MDOT SHA, USFWS and MDNR. This report will include methodologies and results for Tasks 1 and 2 previously outlined. In addition, the USFWS Excel reporting table will be completed and uploaded.

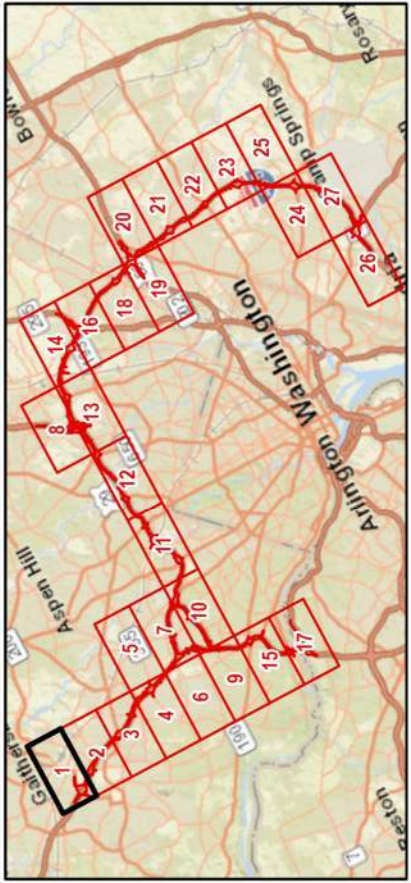


APPENDIX B- PROJECT MAPPING



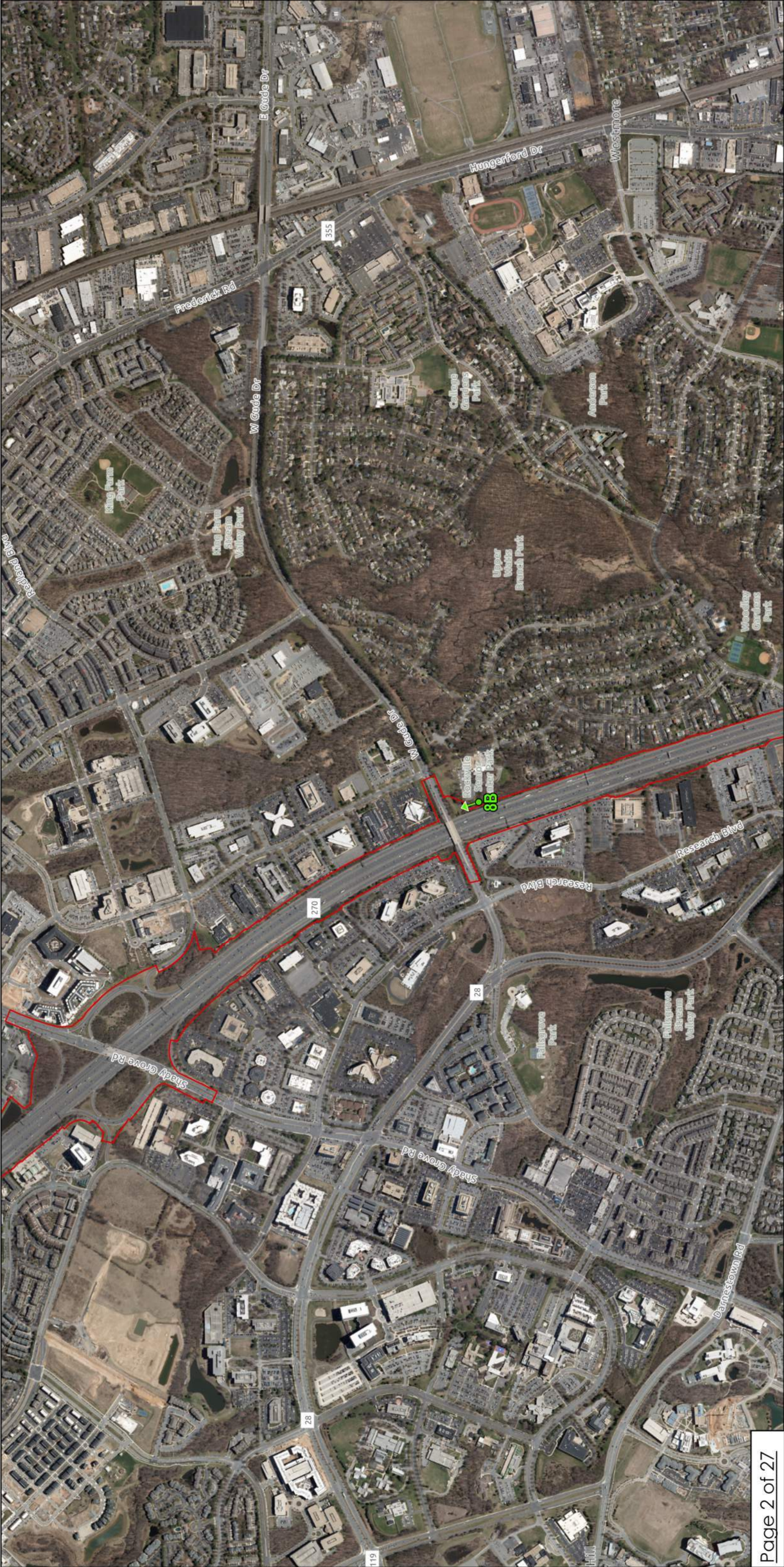
Appendix B:
Bat Acoustic Survey Map
Map Set A
I-495 & I-270 Managed Lanes Study

Esri Community Maps Contributors, City of Gaithersburg, Maryland, MNCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Montgomery County, MD, MNCPPC, VITA, Esri, HERE, Garmin, NGA, USGS, NPS, MD IMAP, DoIT



- Legend**
- Monitoring Location with T/E
 - Monitoring Locations
 - Survey Direction of Microphone
 - Study Area

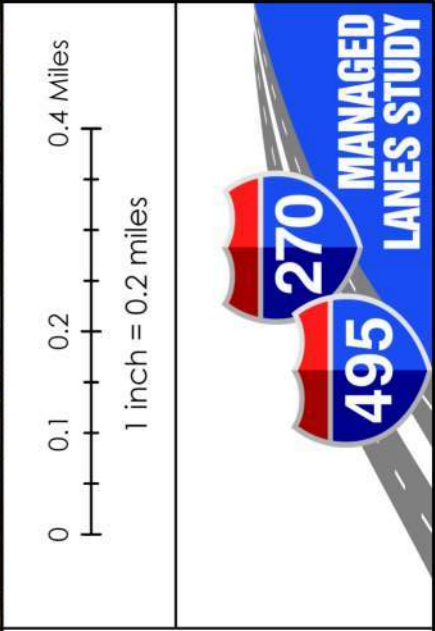
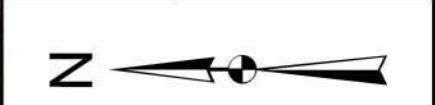


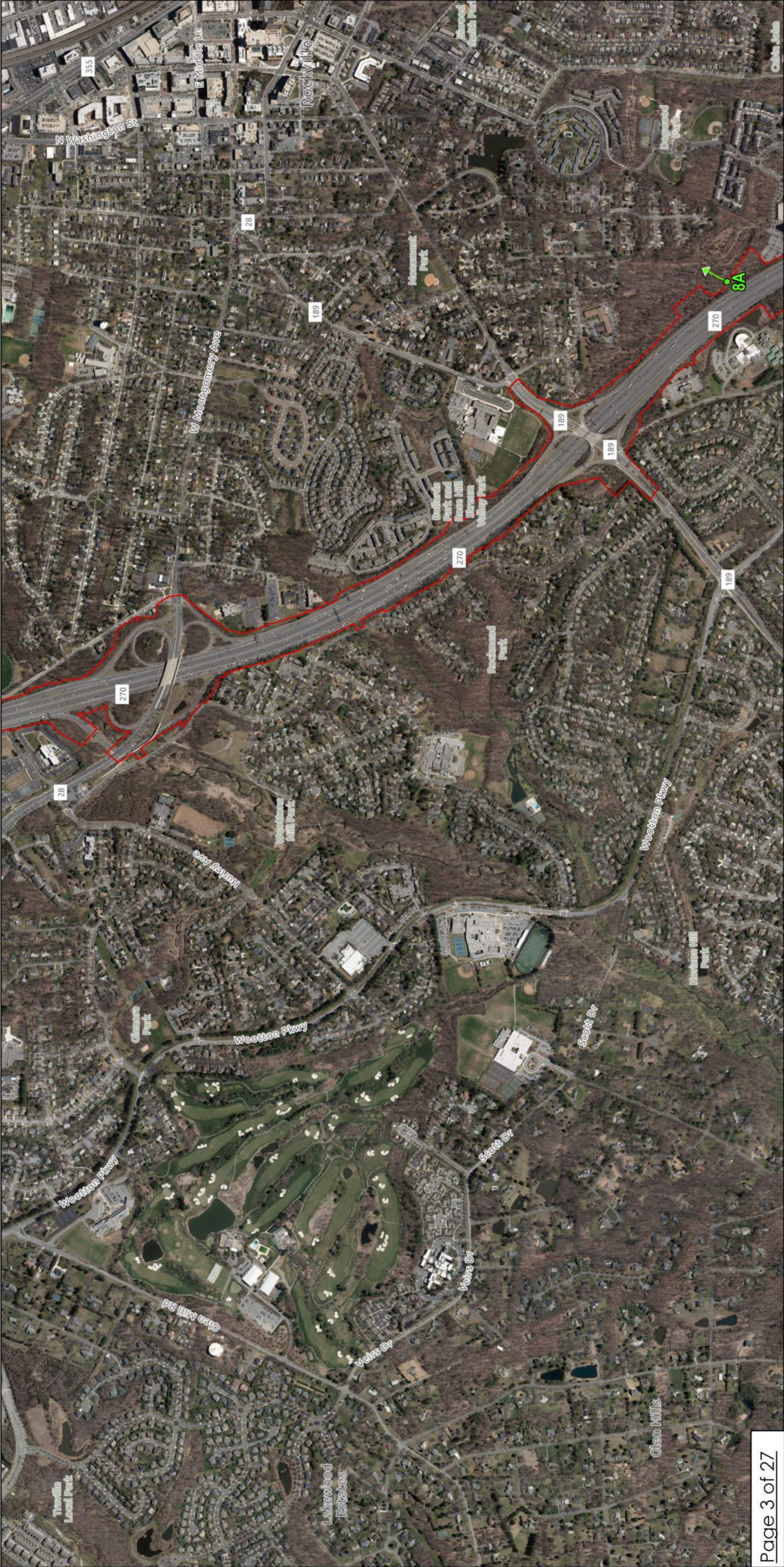


Appendix B:
Bat Acoustic Survey Map
Map Set A
I-495 & I-270 Managed Lanes Study

MD iMAP, DoIT, Esri, HERE, Garmin, NGA, USGS, NPS, Esri Community Maps Contributors, City of Gaithersburg, Maryland, City of Rockville, MD, MNCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

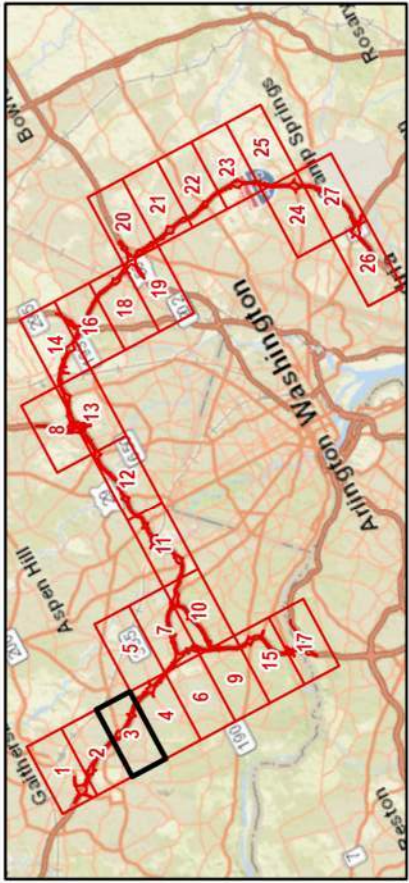
- Legend**
- Monitoring Location with T/E
 - Monitoring Locations
 - Survey Direction of Microphone
 - Study Area





Appendix B: Bat Acoustic Survey Map Map Set A I-495 & I-270 Managed Lanes Study

Esri Community Maps Contributors, City of Rockville, MD, MNCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, MD iMAP, DoIT, Esri, HERE, Garmin, NGA, USGS, NPS

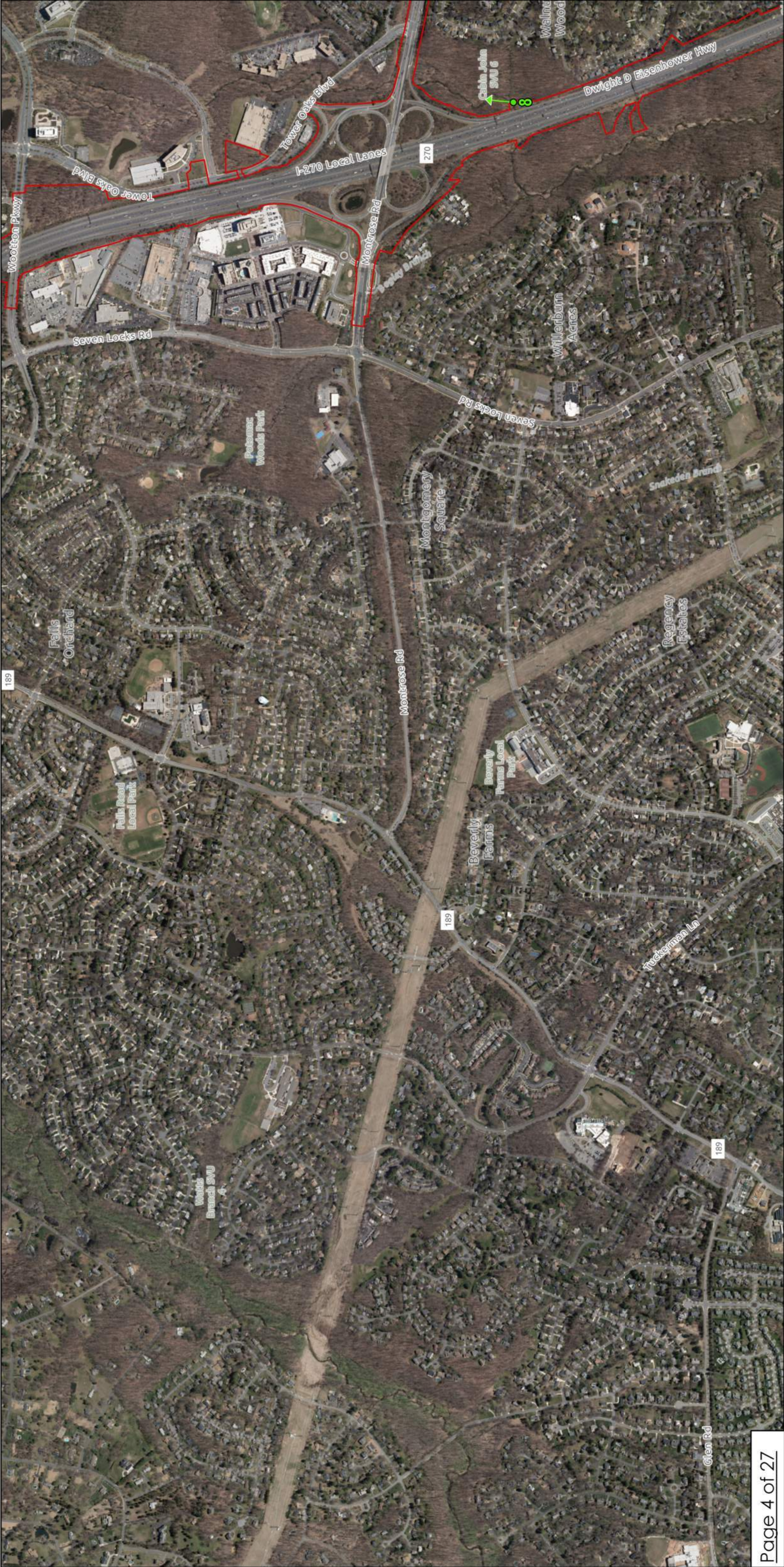


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 - Monitoring Locations
 - Survey Direction of Microphone
 - Study Area



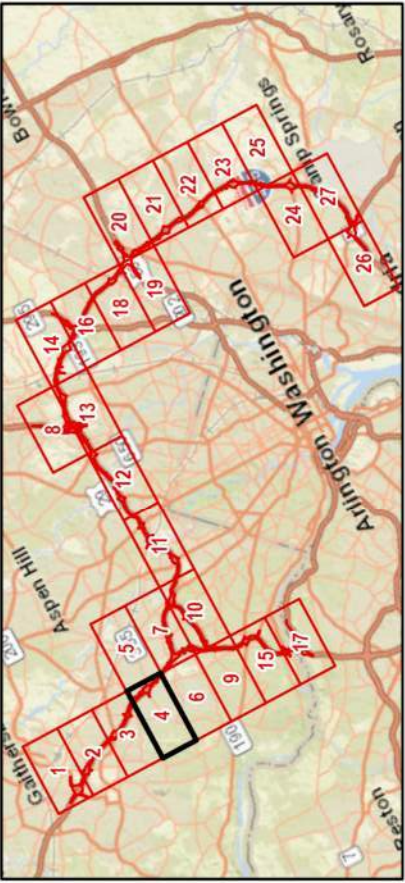
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1 inch = 0.2 miles



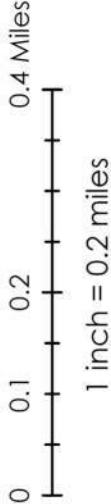


Appendix B: Bat Acoustic Survey Map Map Set A I-495 & I-270 Managed Lanes Study

Montgomery County, MD, MNCPPC, VITA, Esri, HERE, Garmin, NGA, USGS, NPS, Esri Community Maps Contributors, City of Rockville, MD, Fairfax County, VA, MNCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/ NASA, USGS, EPA, NPS, US Census Bureau, USDA, MD IMAP, DoIT



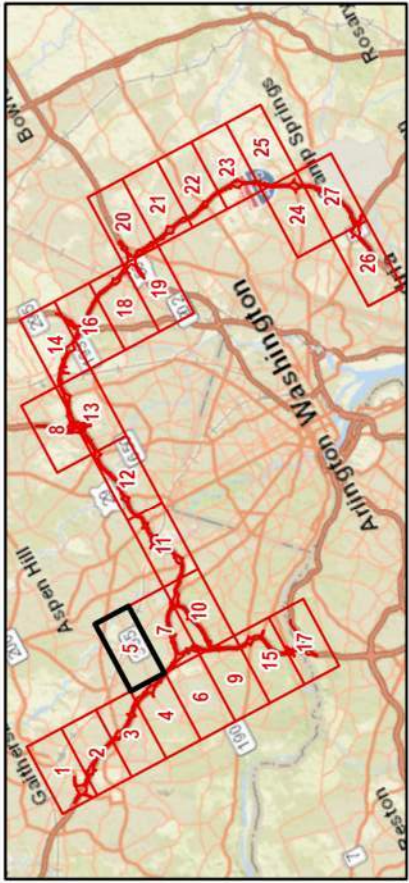
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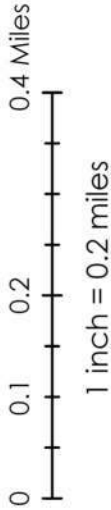


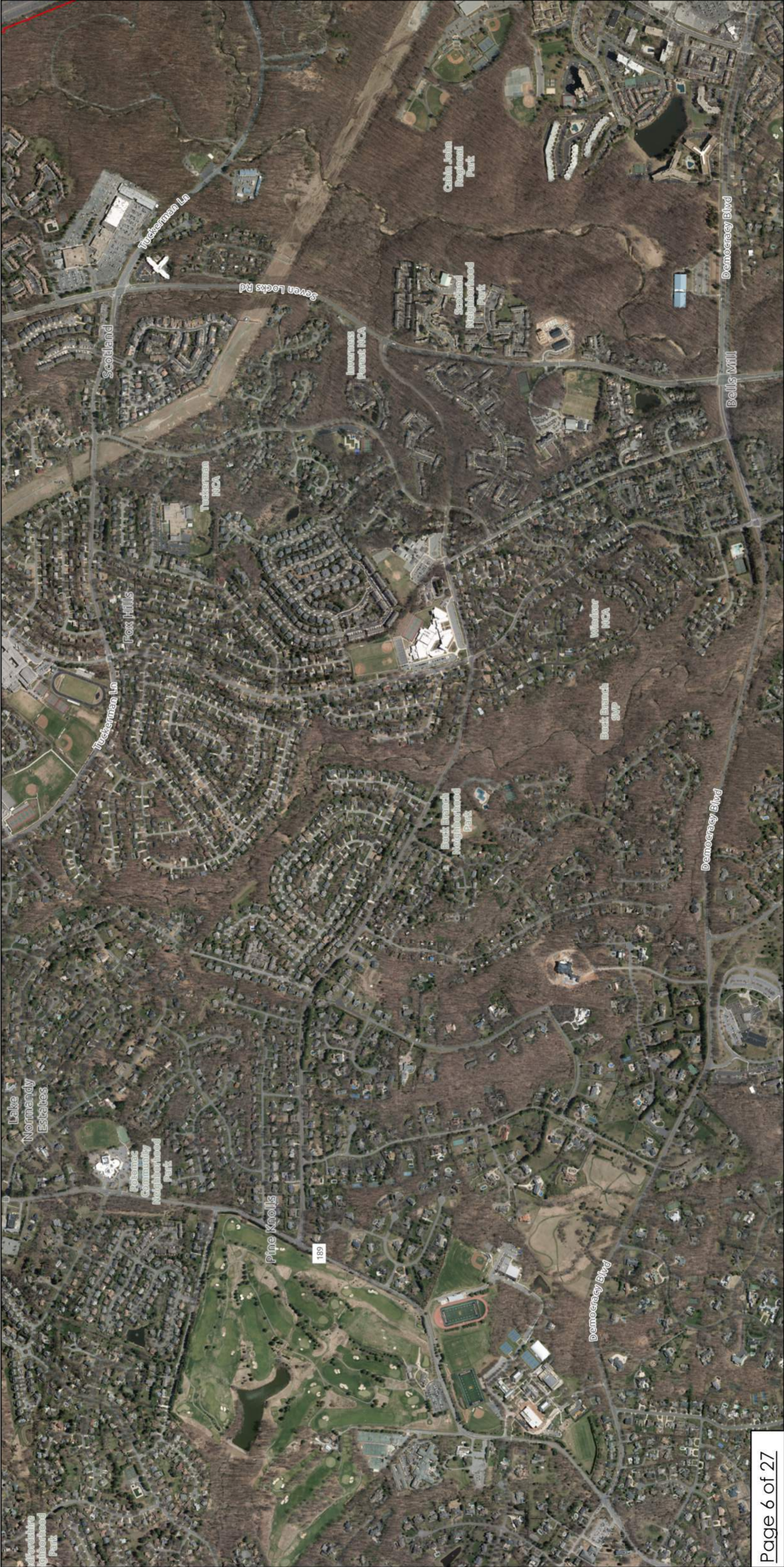
Appendix B:
Bat Acoustic Survey Map
Map Set A
I-495 & I-270 Managed Lanes Study

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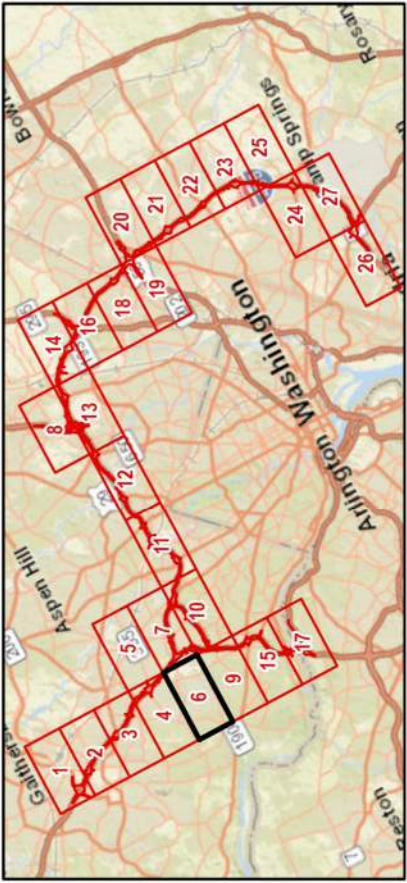
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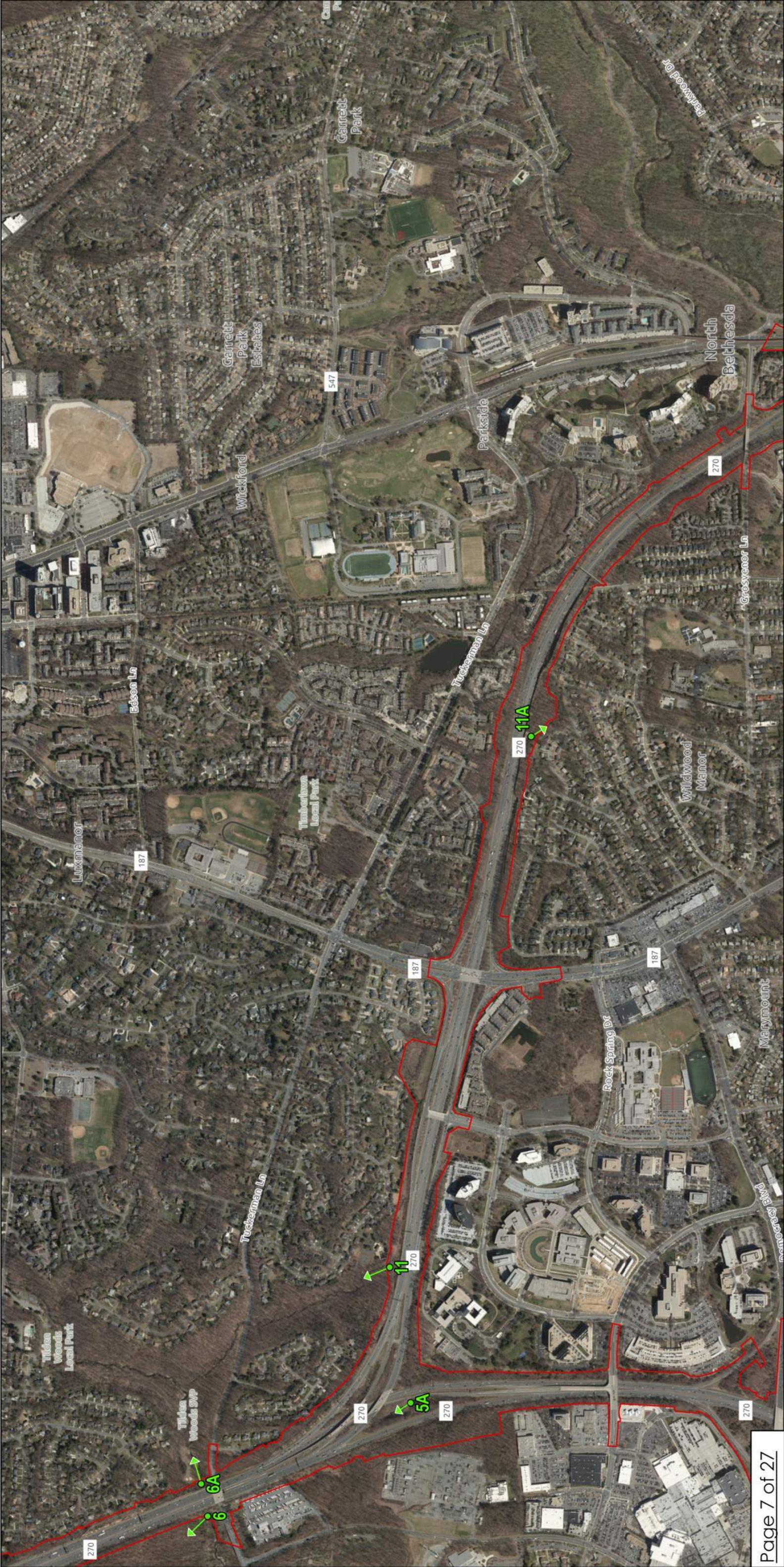
Appendix B:
Bat Acoustic Survey Map
Map Set A
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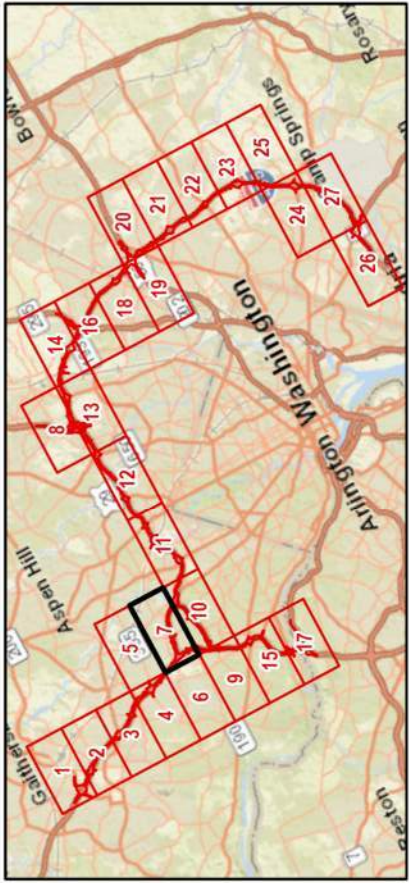
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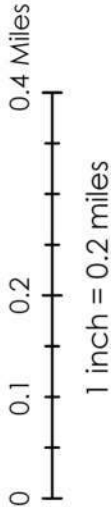


Appendix B:
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Map Set A
I-495 & I-270 Managed Lanes Study

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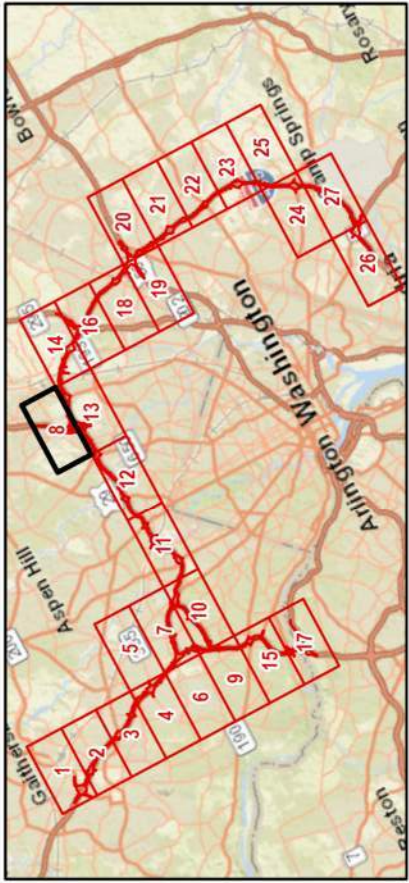
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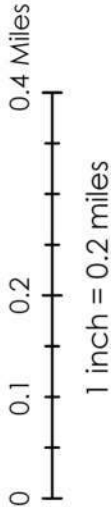


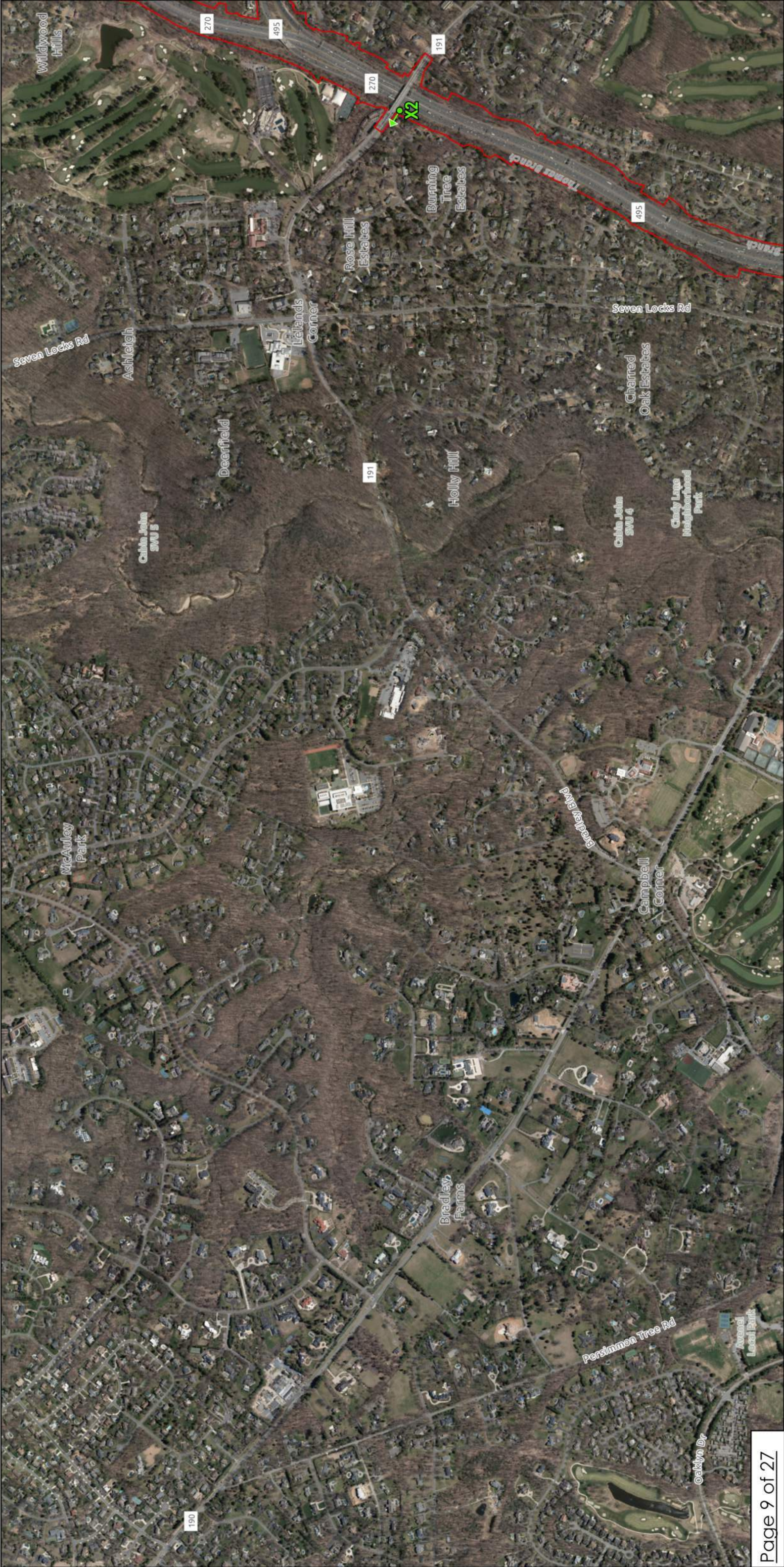
Appendix B:
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I-495 & I-270 Managed Lanes Study

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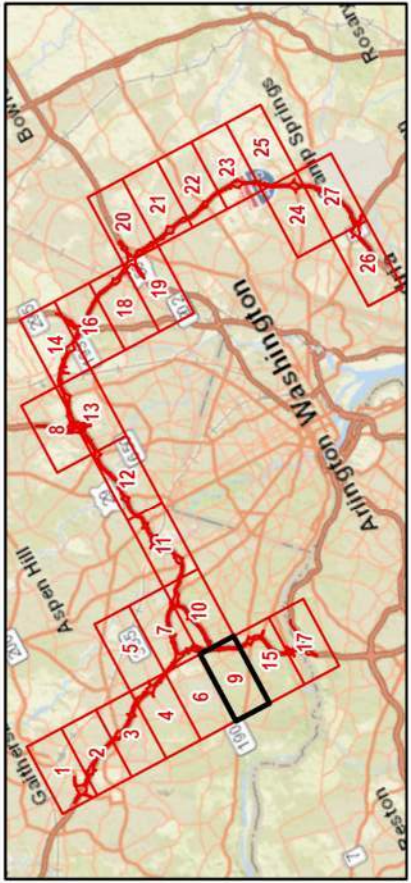
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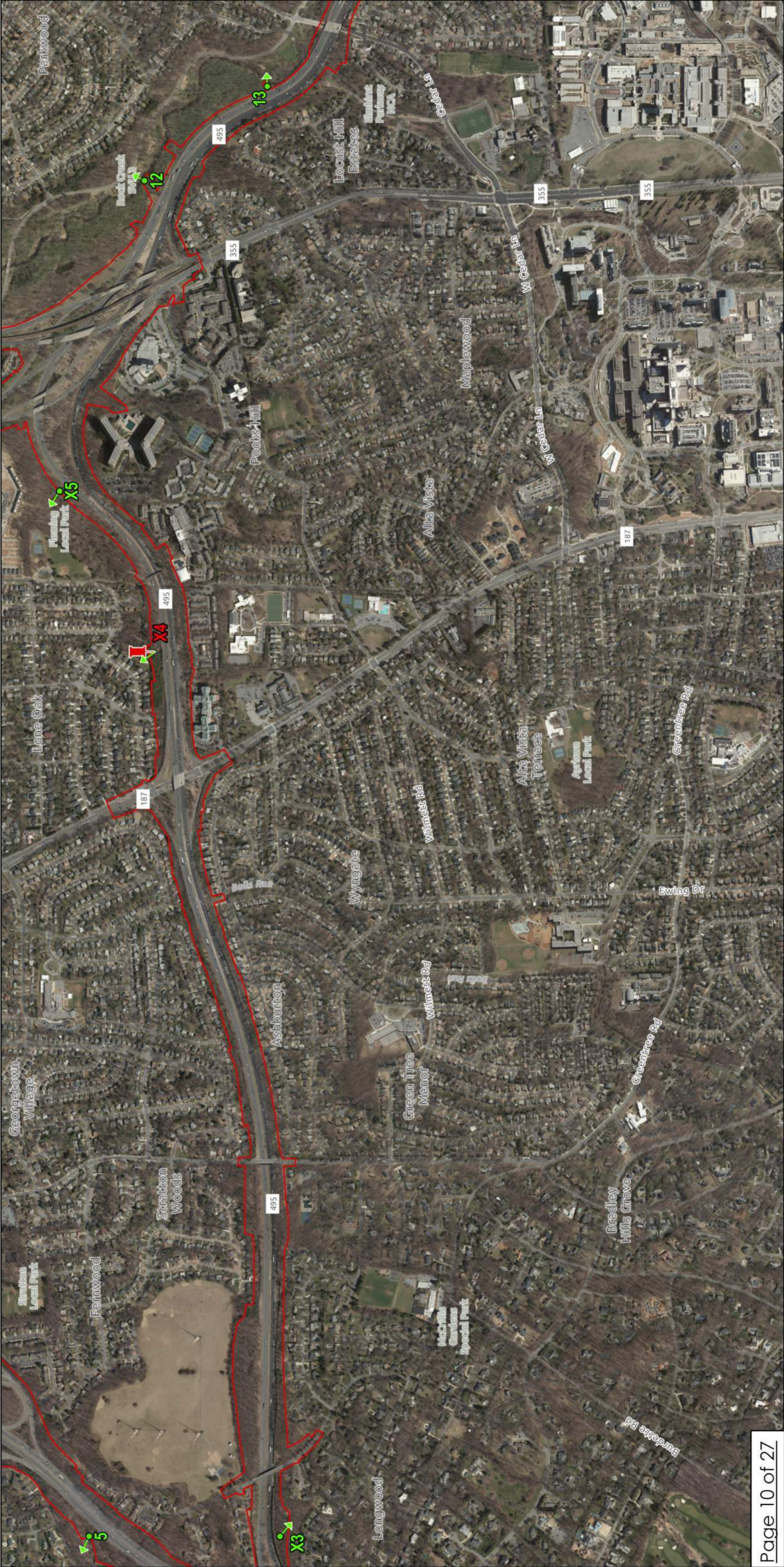
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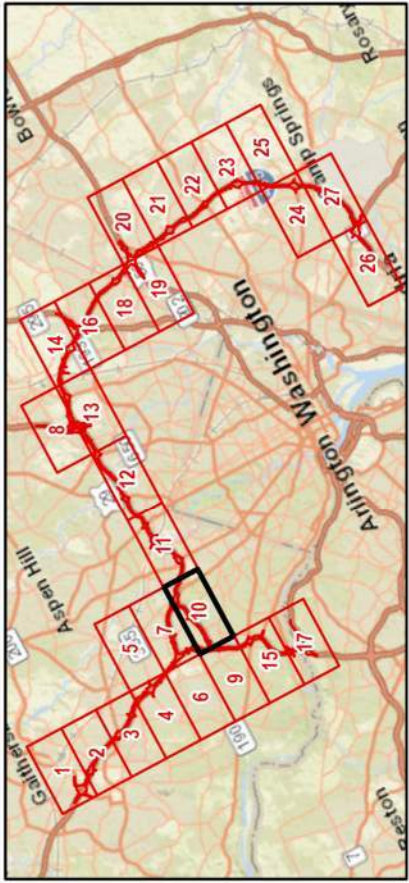




Appendix B: Bat Acoustic Survey Map Map Set A

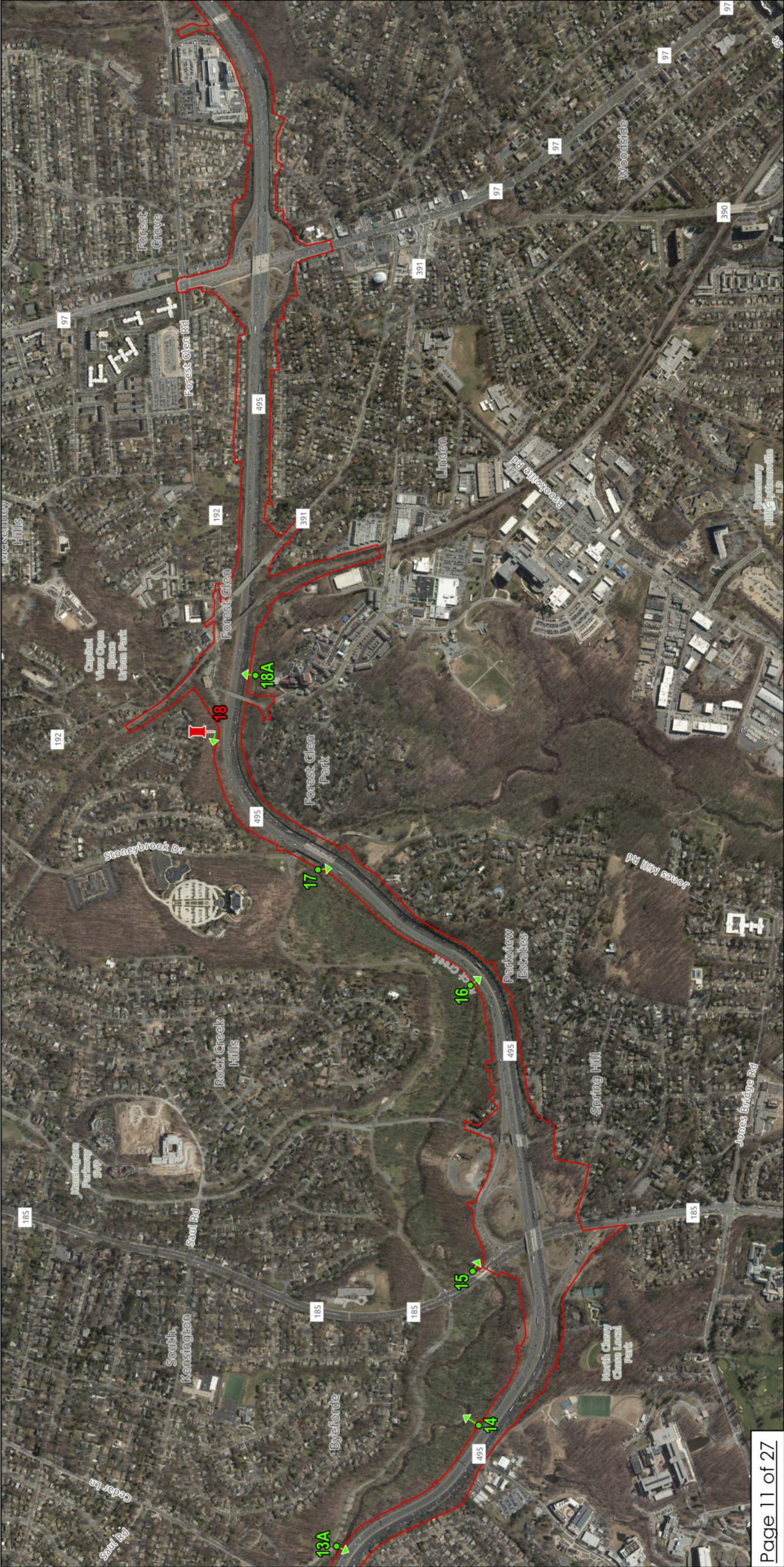
I-495 & I-270 Managed Lanes Study

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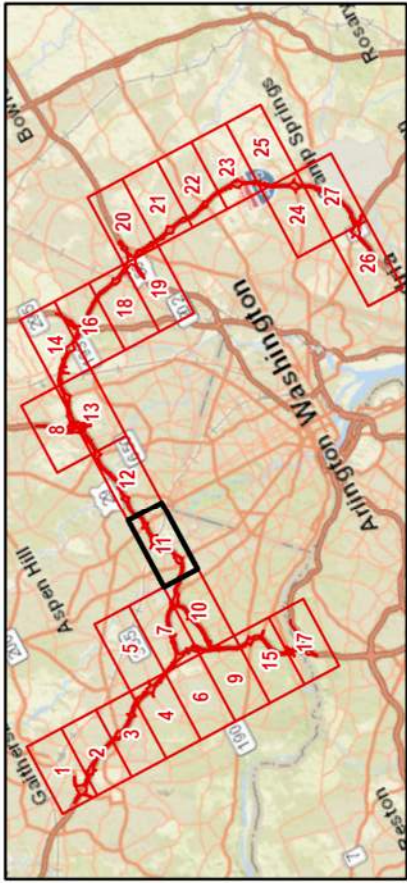


Appendix B: Bat Acoustic Survey Map

Map Set A

I-495 & I-270 Managed Lanes Study

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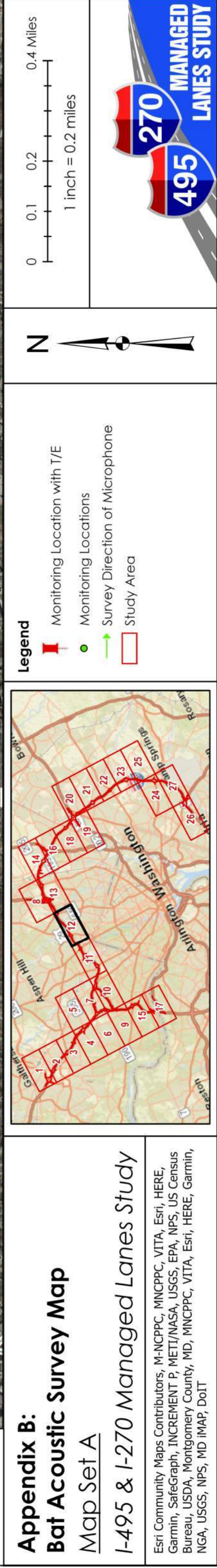
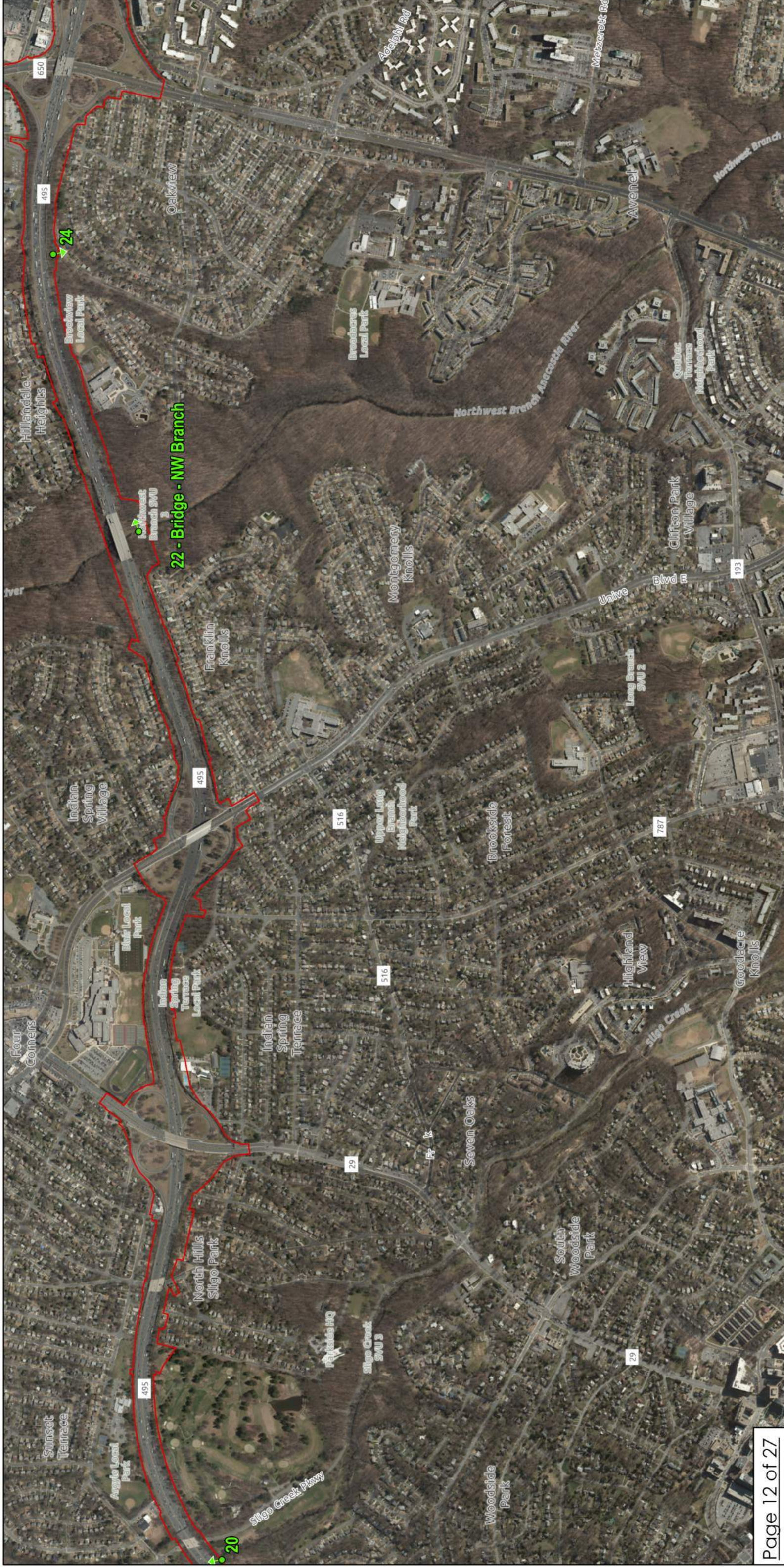


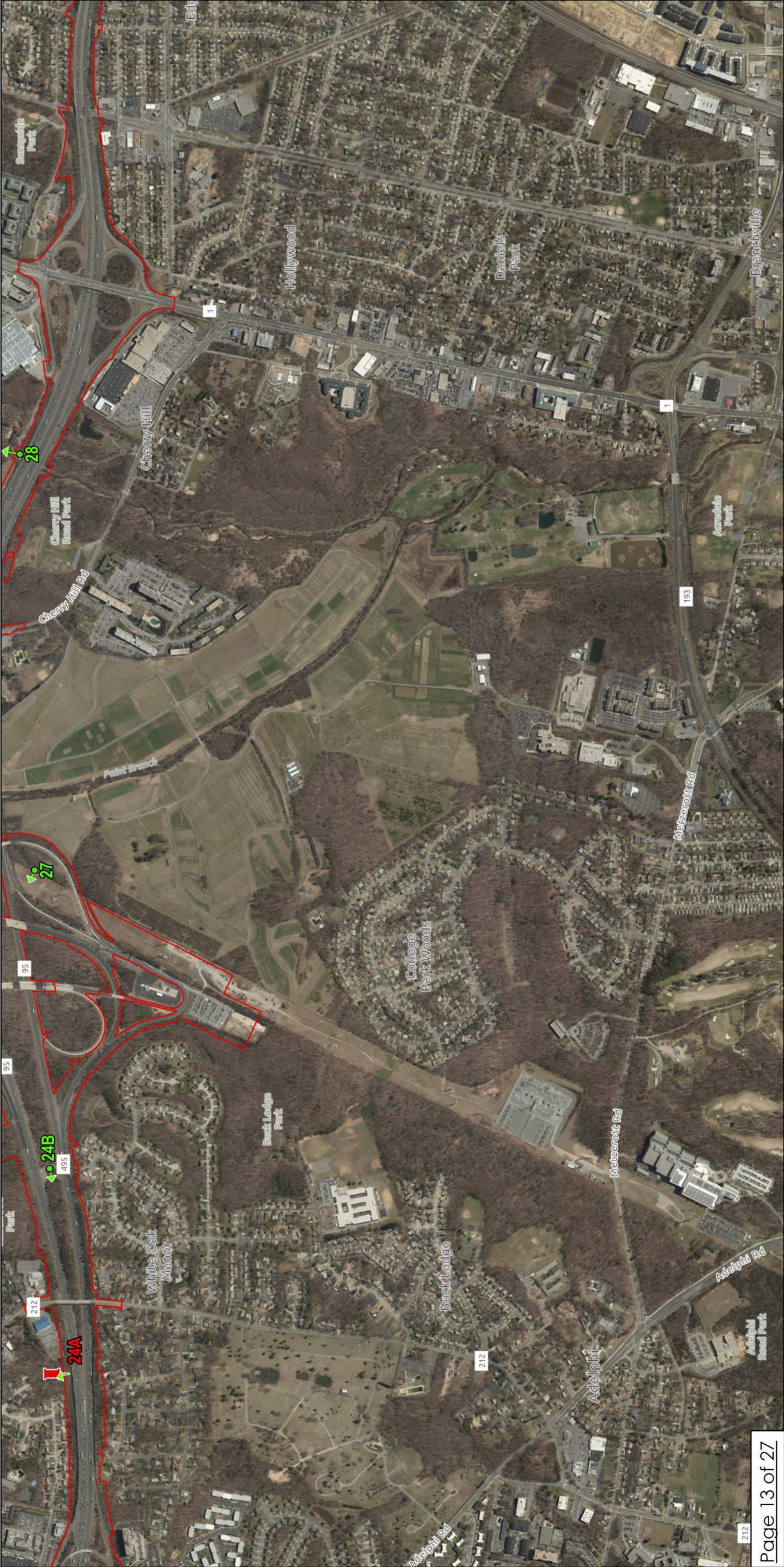
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0 0.1 0.2 0.4 Miles
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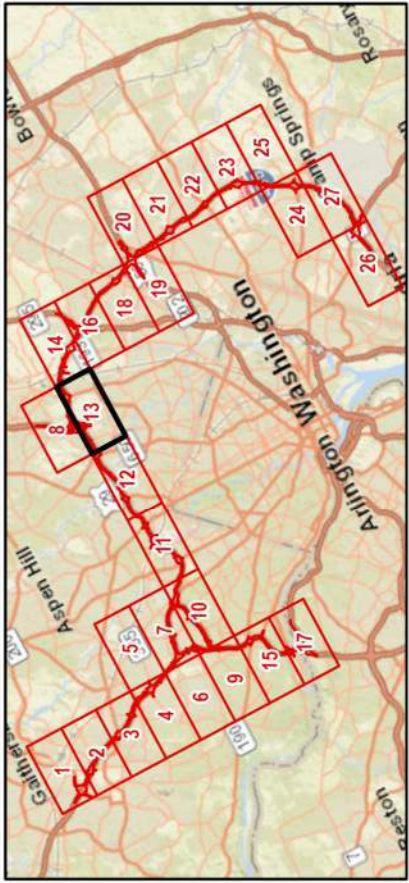






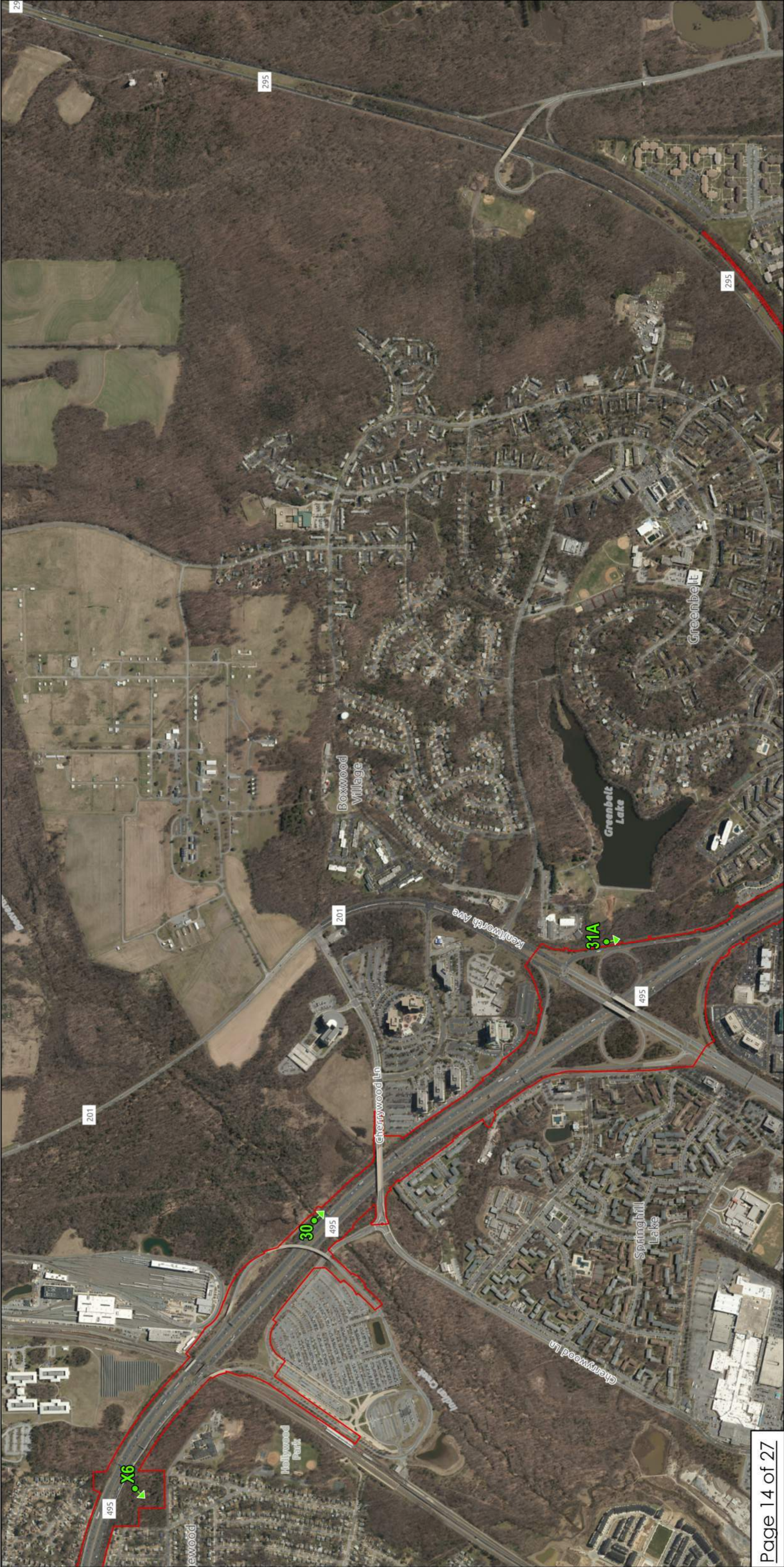
Appendix B: Bat Acoustic Survey Map Map Set A I-495 & I-270 Managed Lanes Study

Esri Community Maps Contributors, University of Maryland, M-NCPPC, MNCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, MD iMAP, DoIT, Esri, HERE, Garmin, NGA, USGS, NPS



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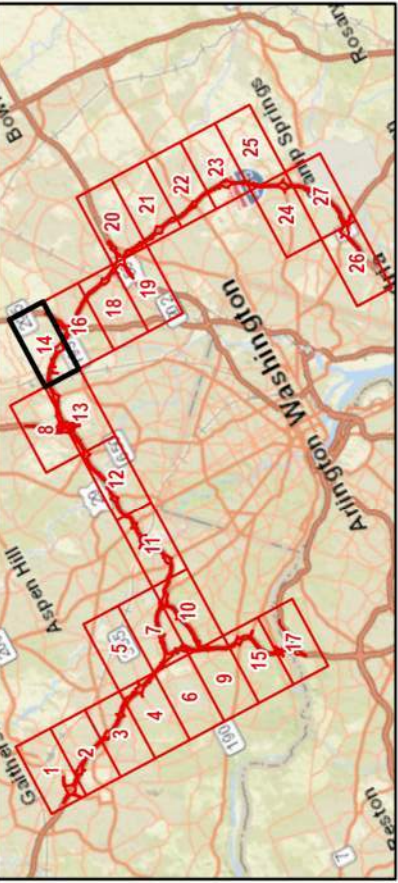


Appendix B: Bat Acoustic Survey Map

Map Set A

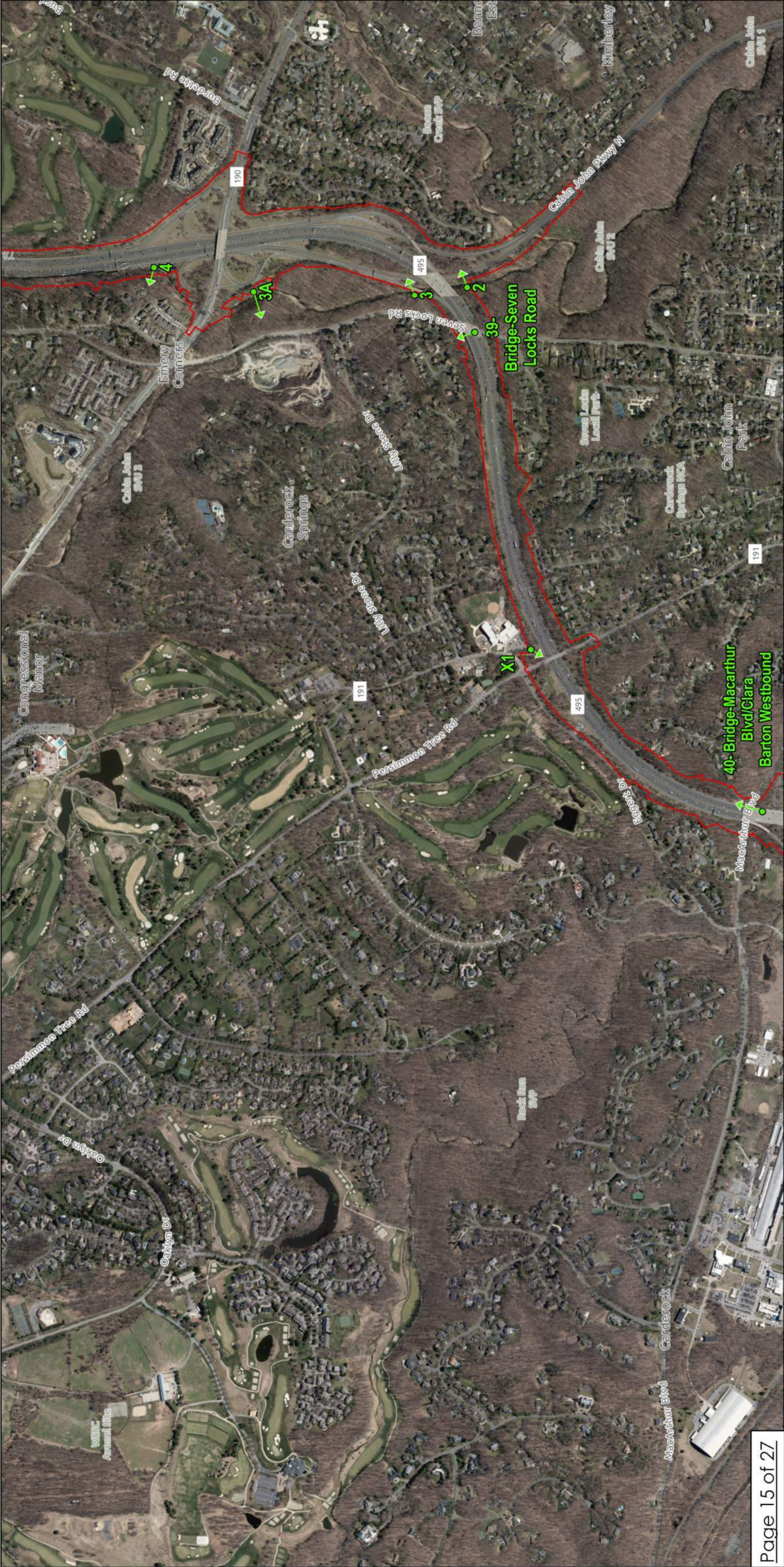
I-495 & I-270 Managed Lanes Study

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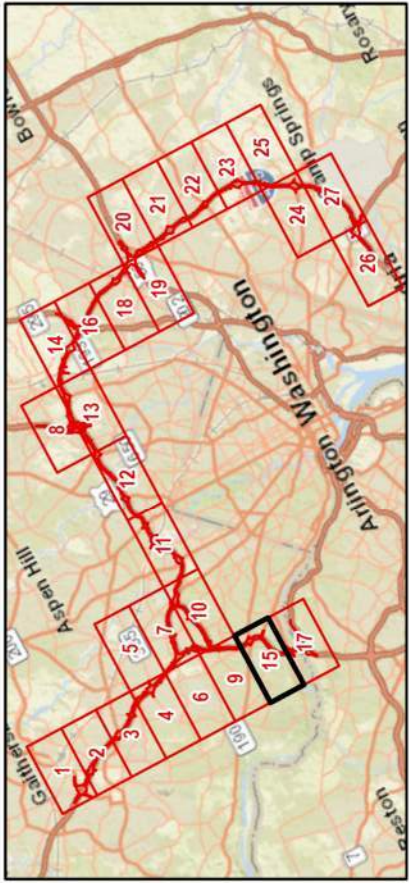
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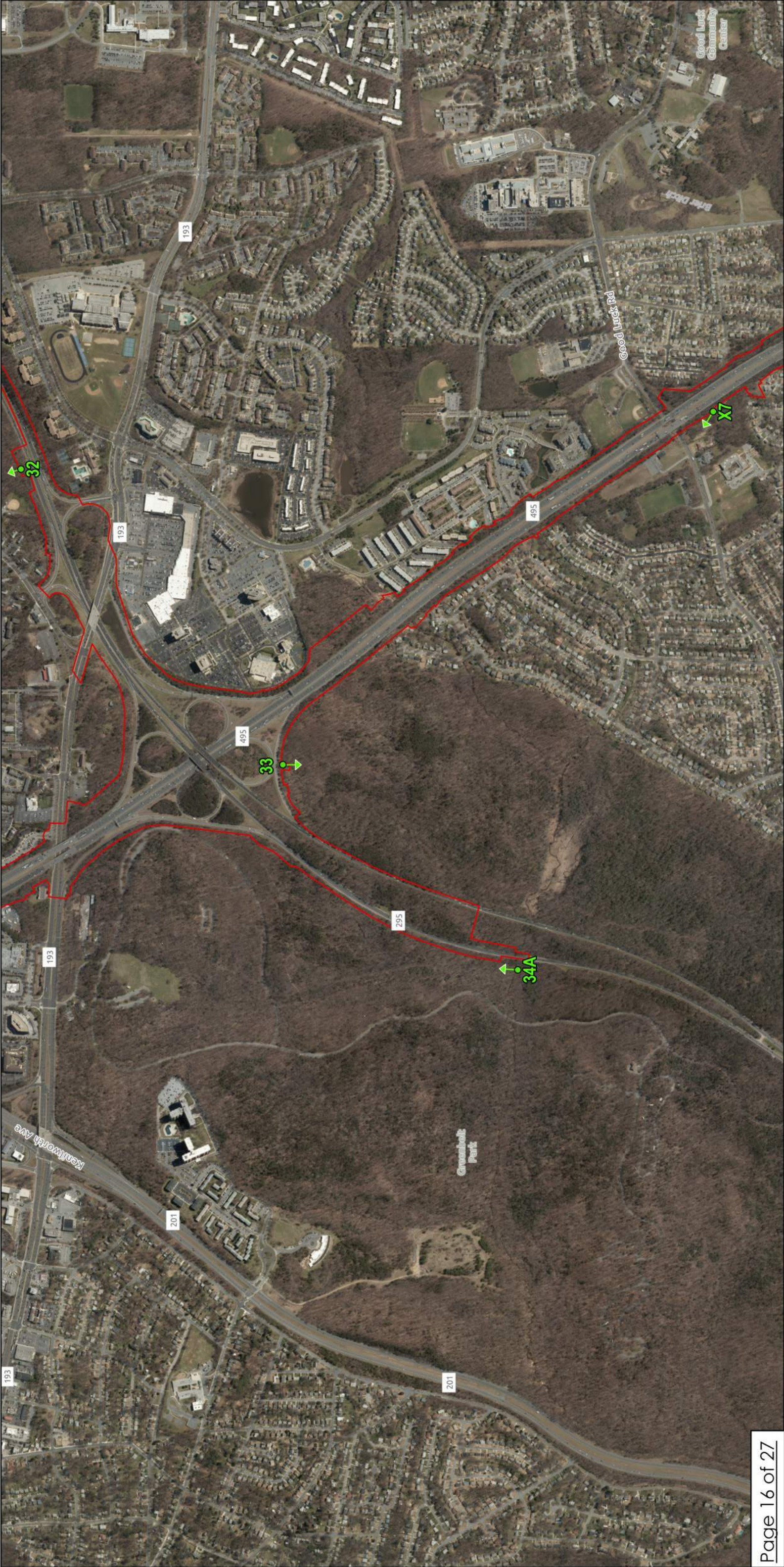
Appendix B: Bat Acoustic Survey Map Map Set A I-495 & I-270 Managed Lanes Study

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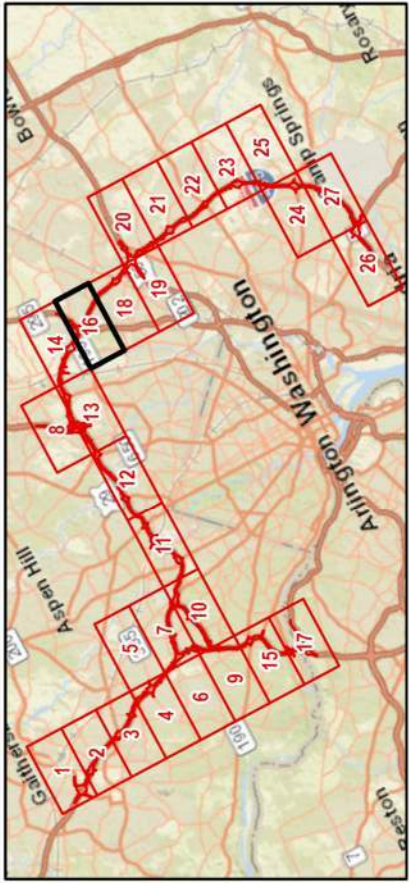
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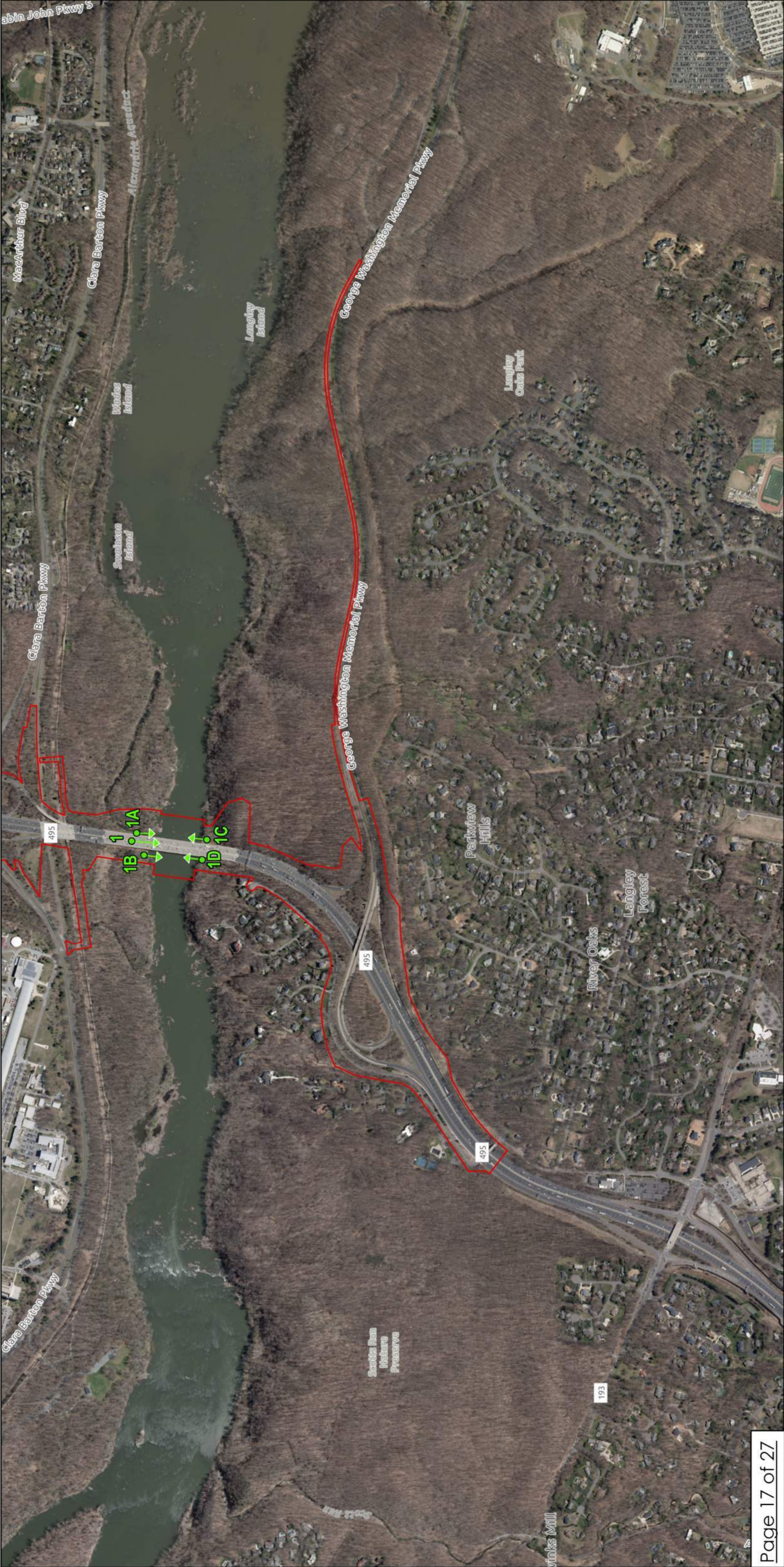
Appendix B:
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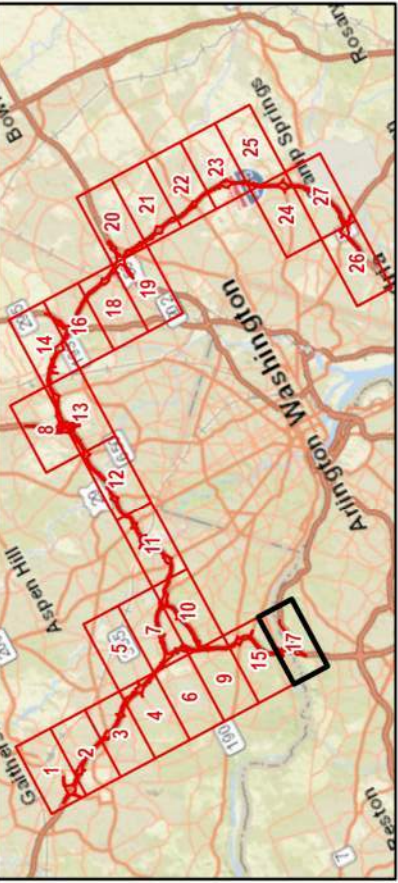
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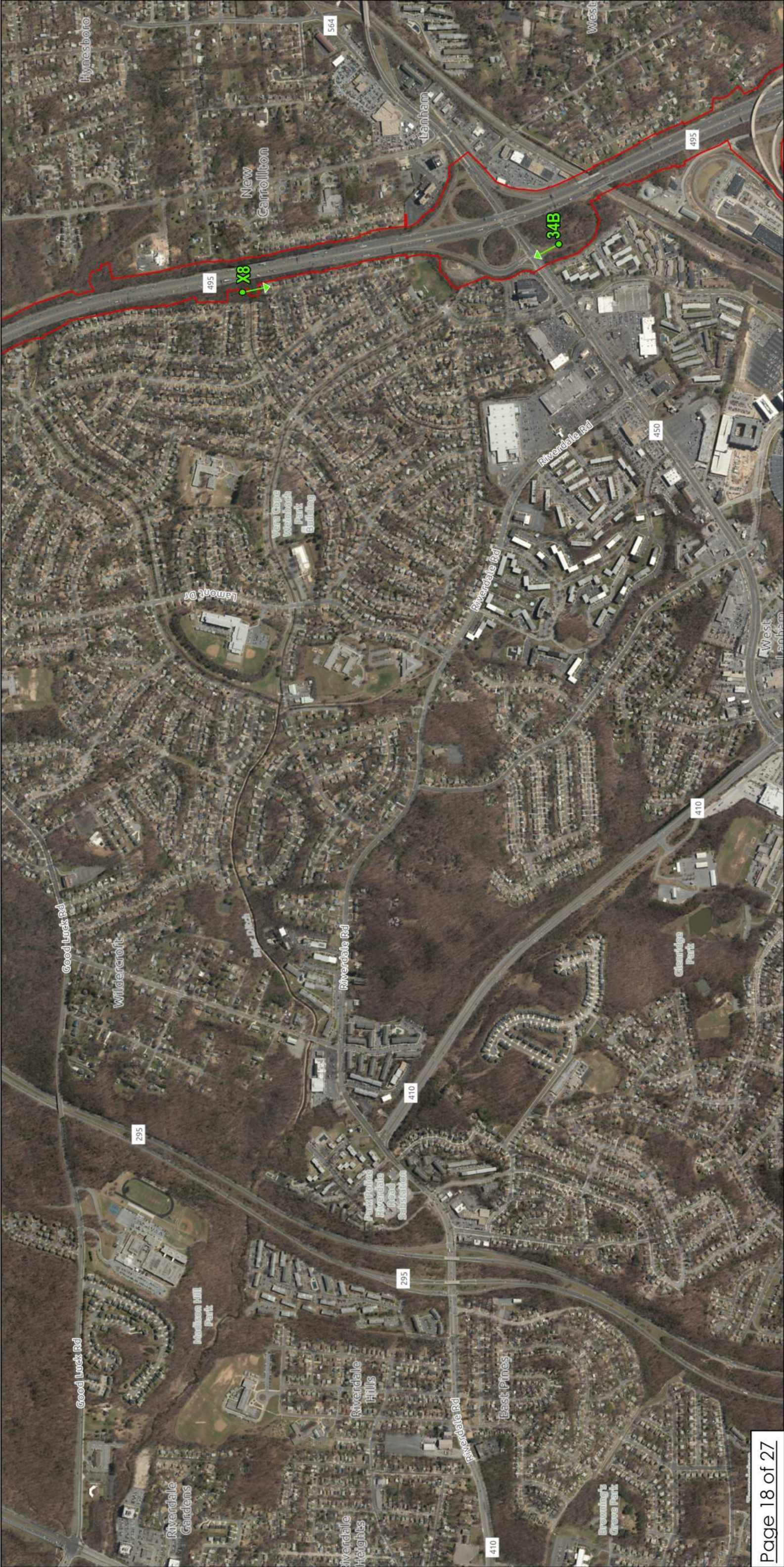
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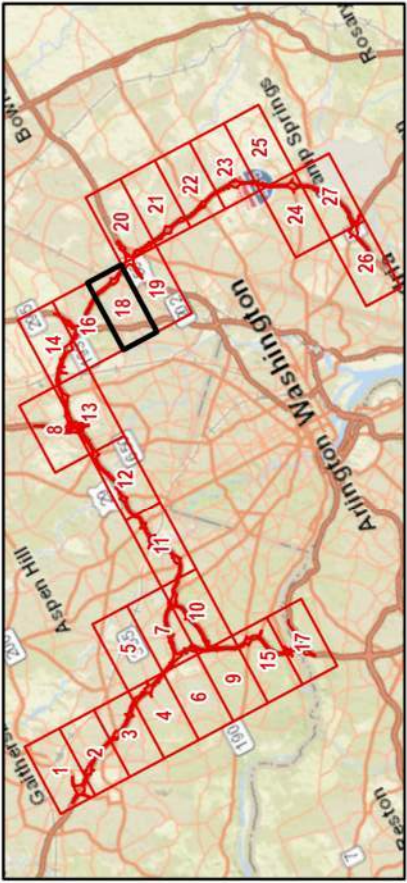


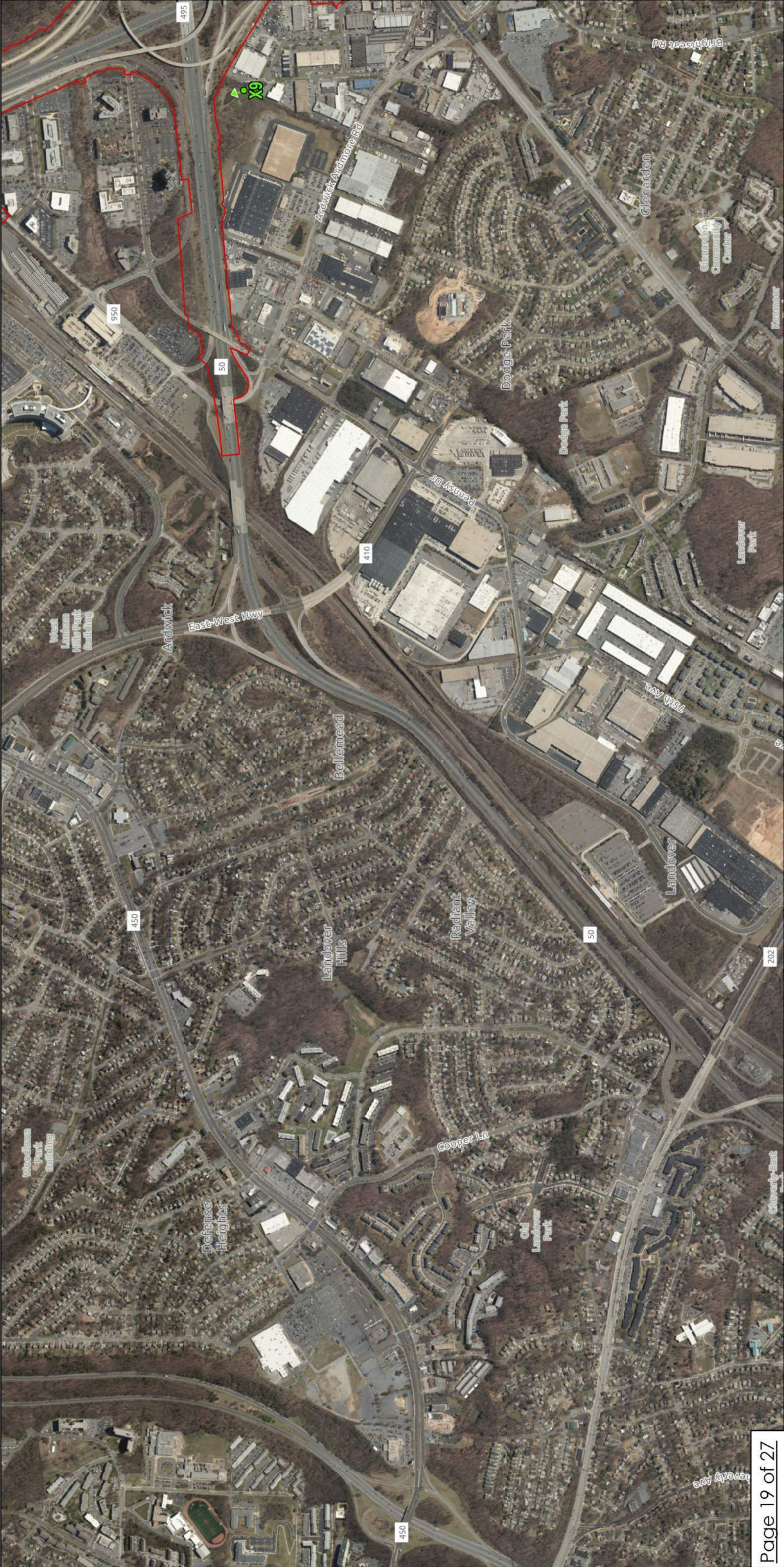


Appendix B:
Bat Acoustic Survey Map
Map Set A
I-495 & I-270 Managed Lanes Study

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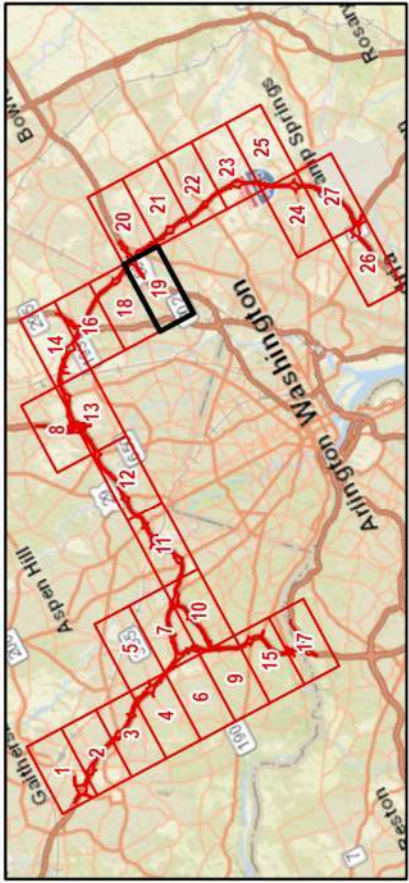
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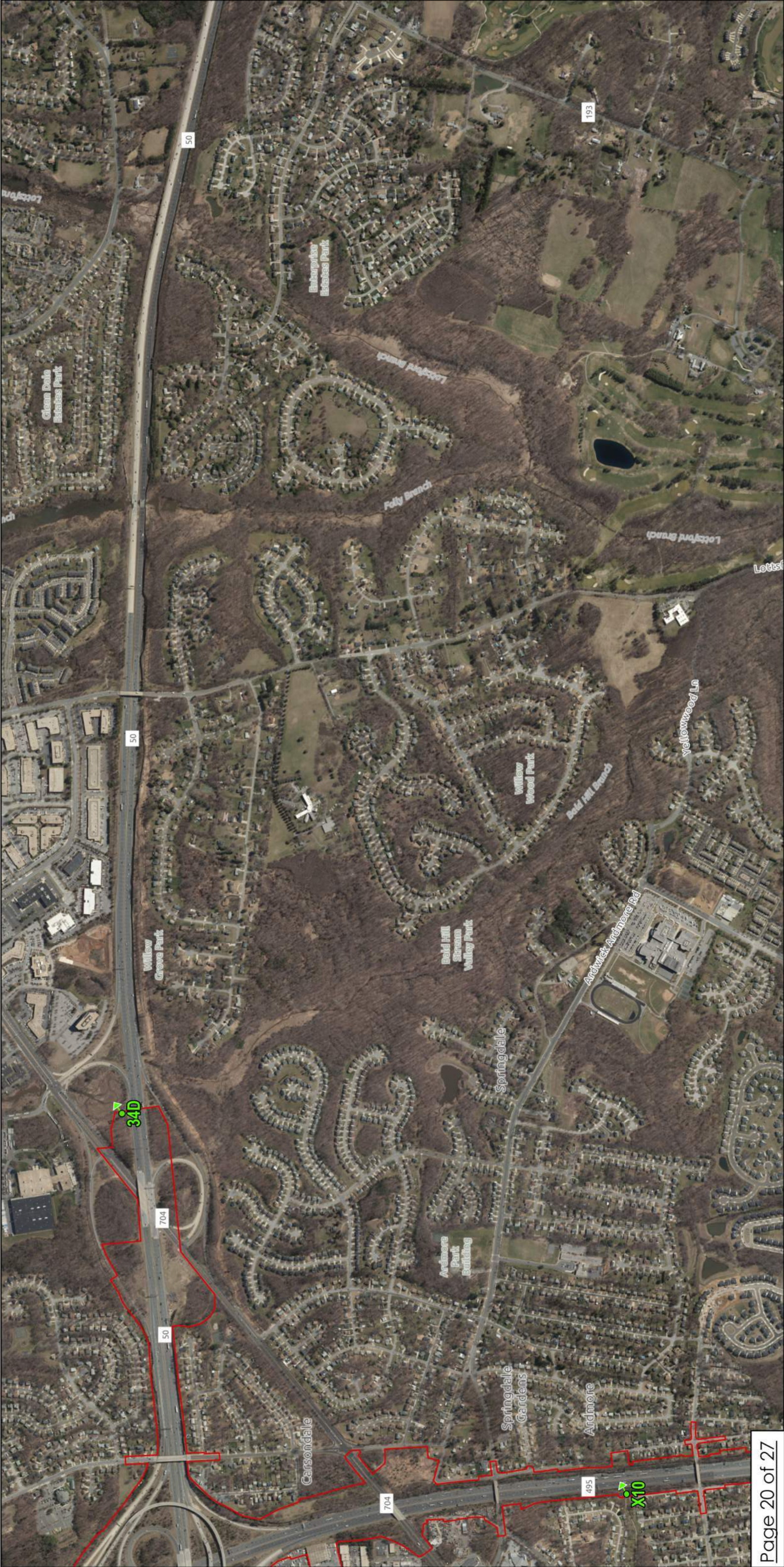
Appendix B:
Bat Acoustic Survey Map
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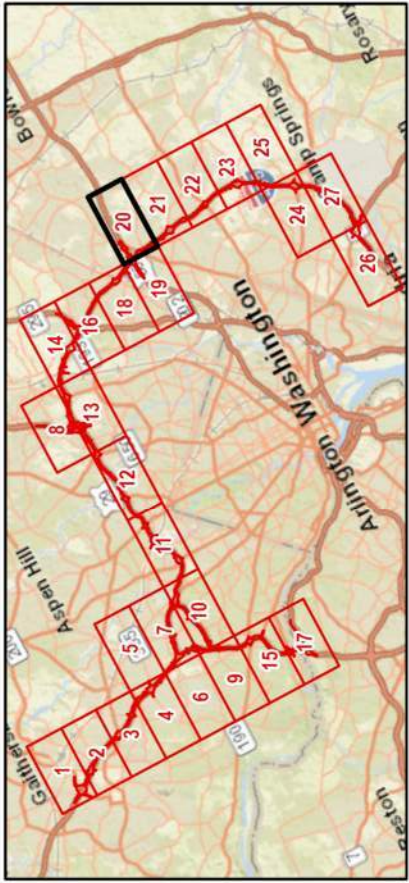
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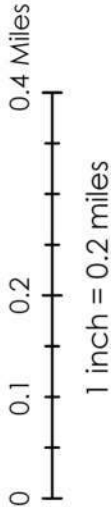


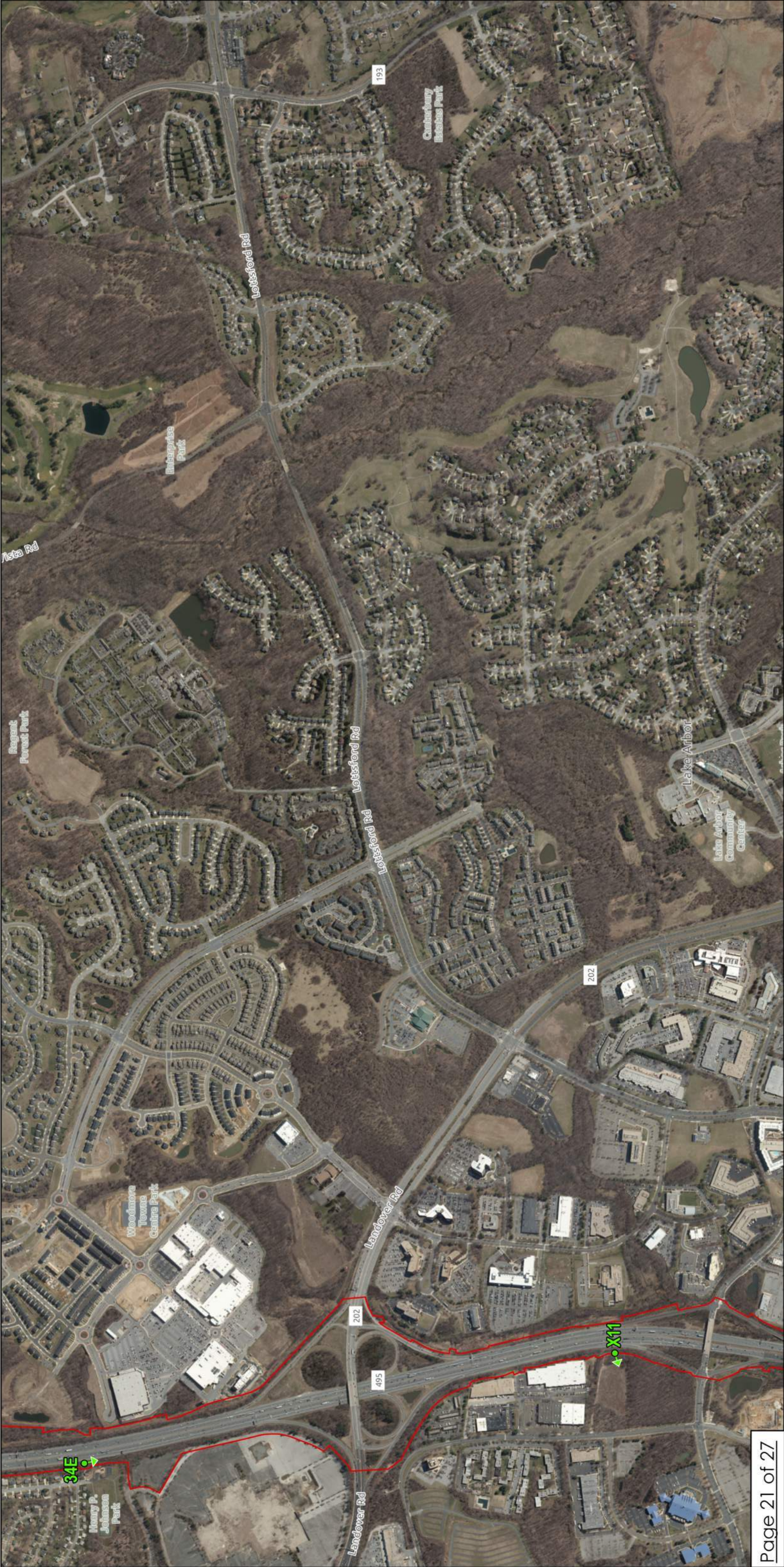
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Esri Community Maps Contributors, County of Anne Arundel, M-NCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, MD iMAP, DoIT, Esri, HERE, Garmin, NGA, USGS, NPS



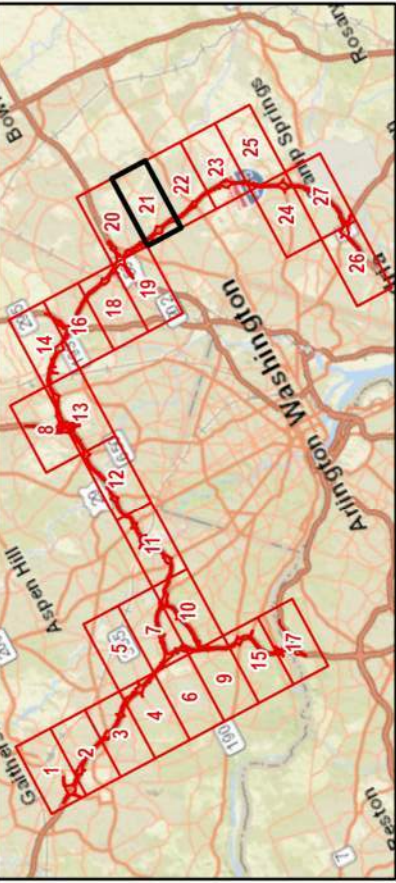
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I-495 & I-270 Managed Lanes Study

Montgomery County, MD, MNCPPC, VITA, Esri, HERE, Garmin, NGA, USGS, NPS, Esri Community Maps Contributors, County of Anne Arundel, M-NCPPC, VITA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, MD iMAP, DoIT



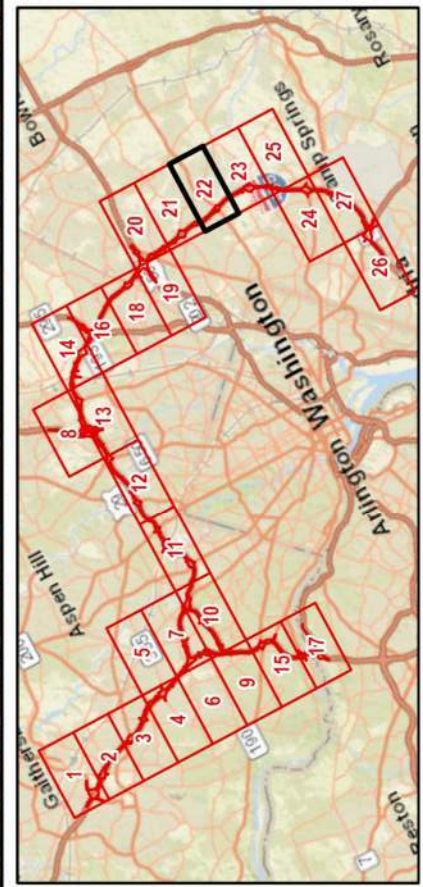
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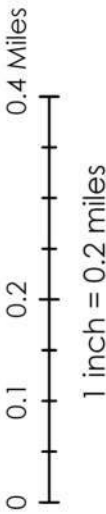


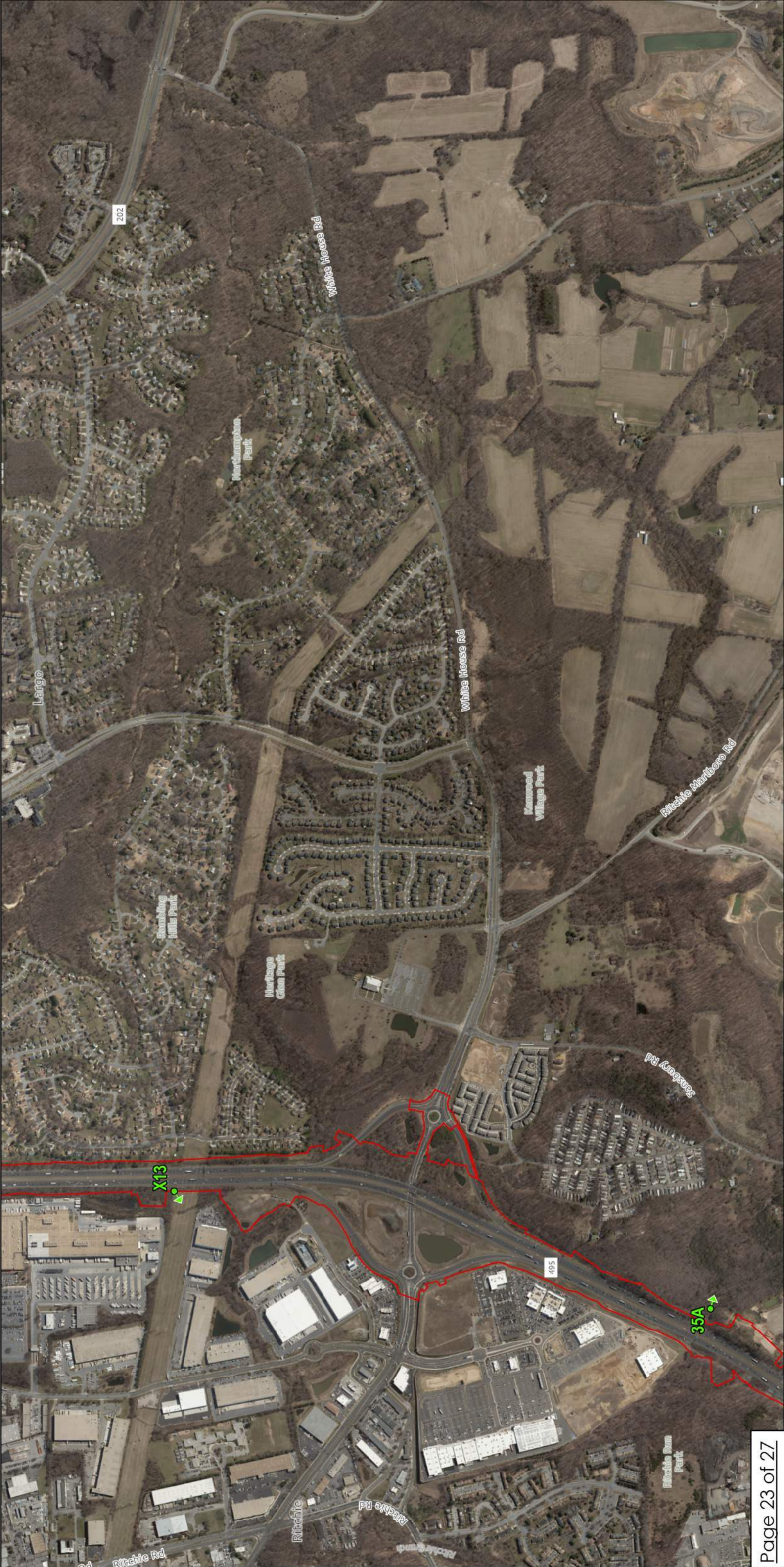
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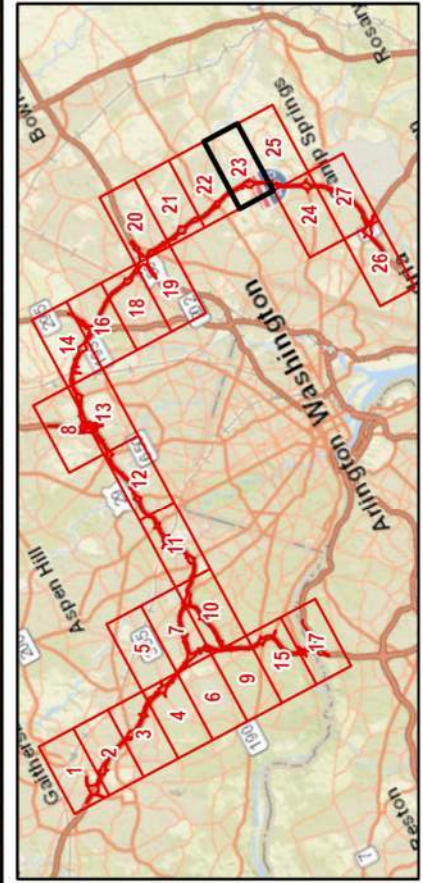
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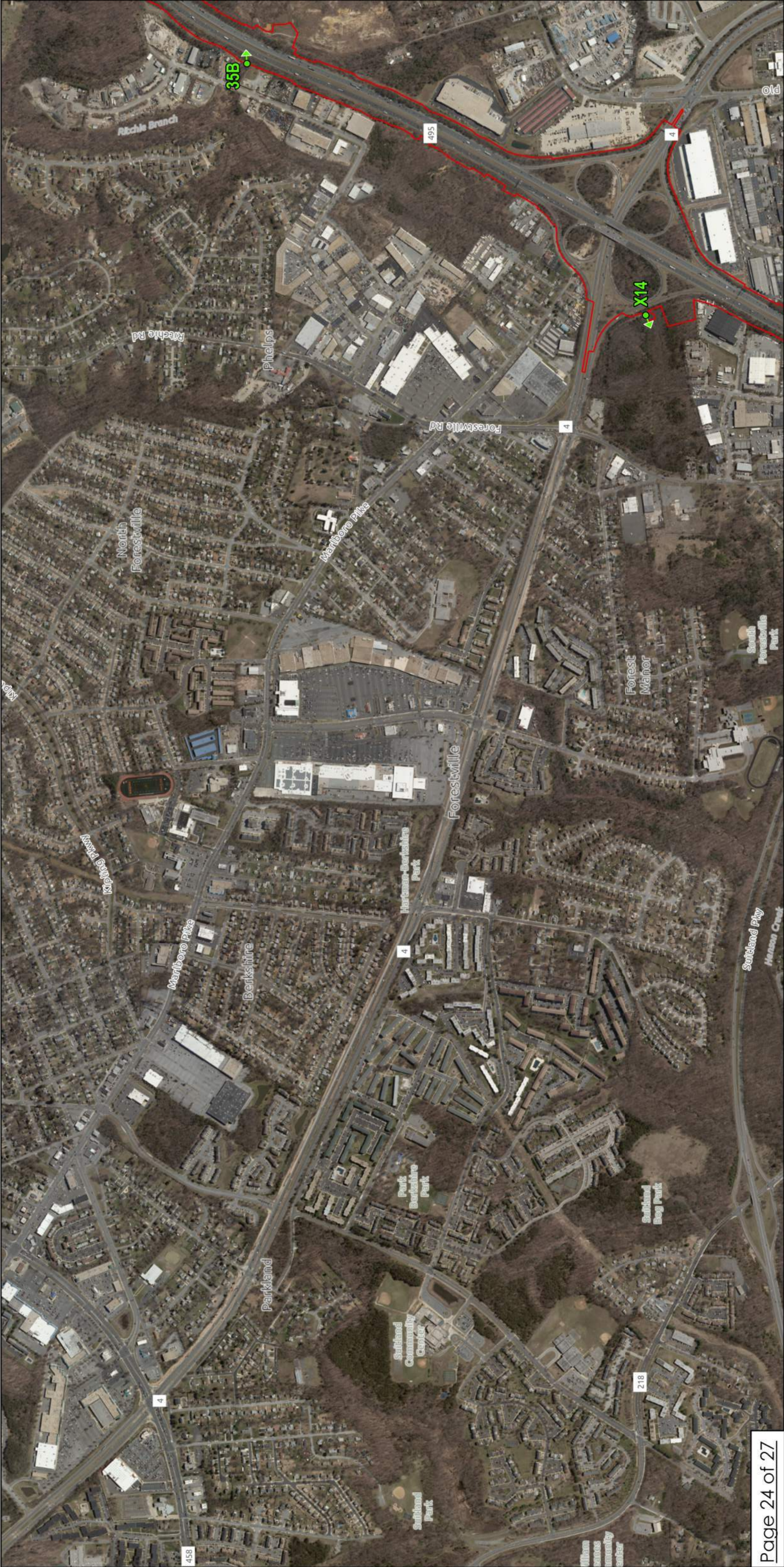
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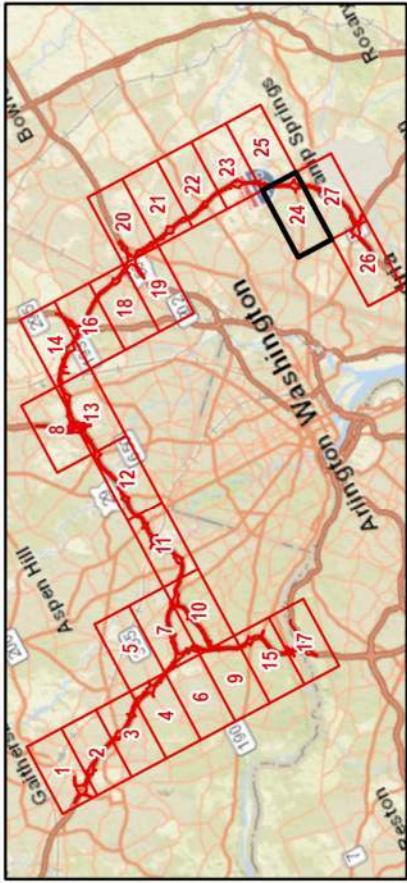
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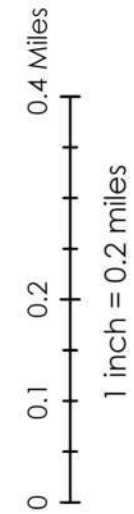


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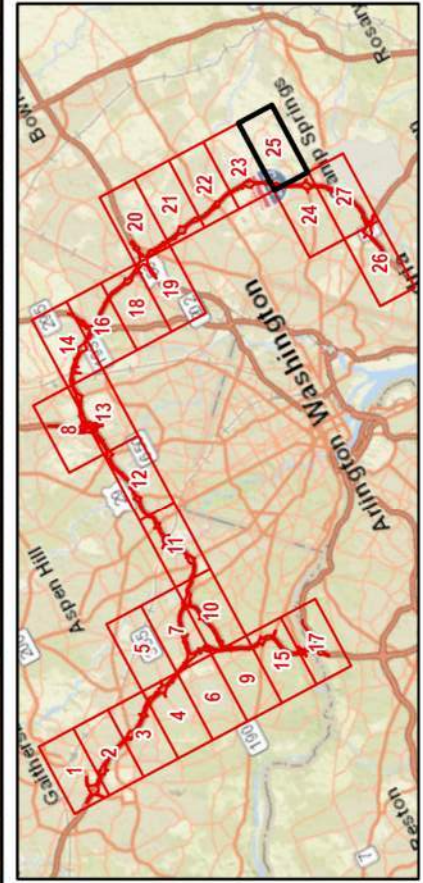
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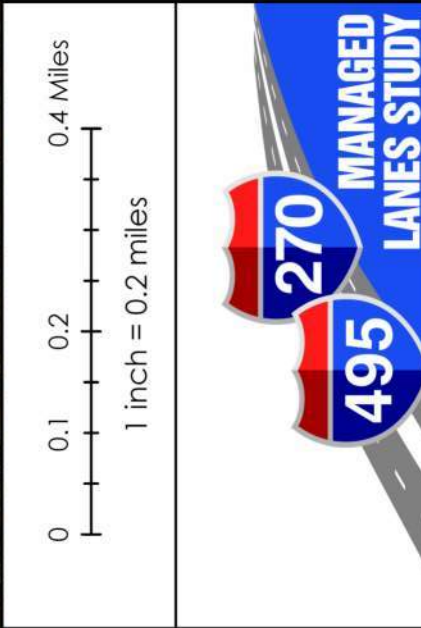
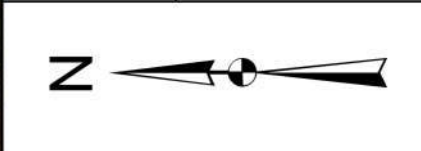
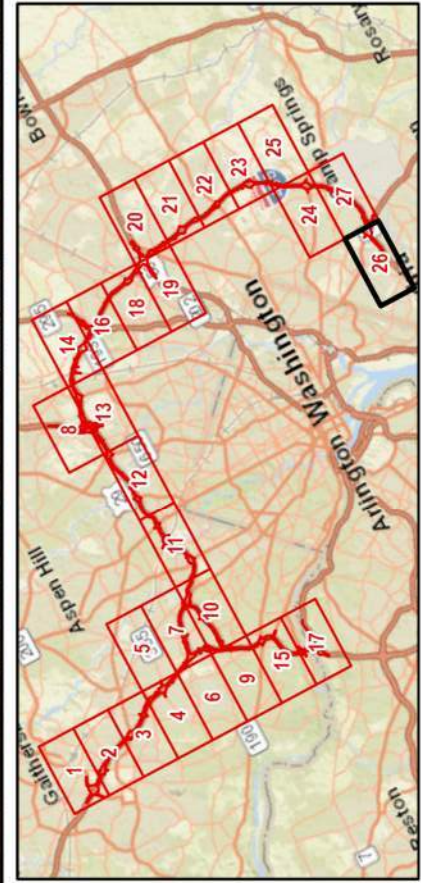




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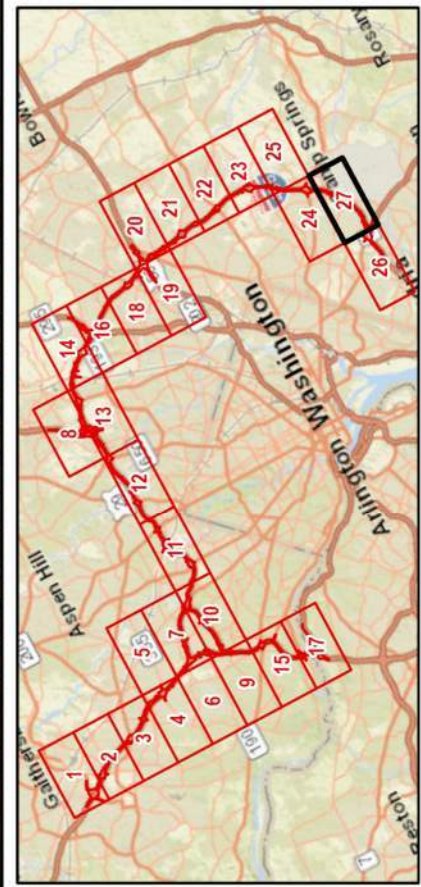
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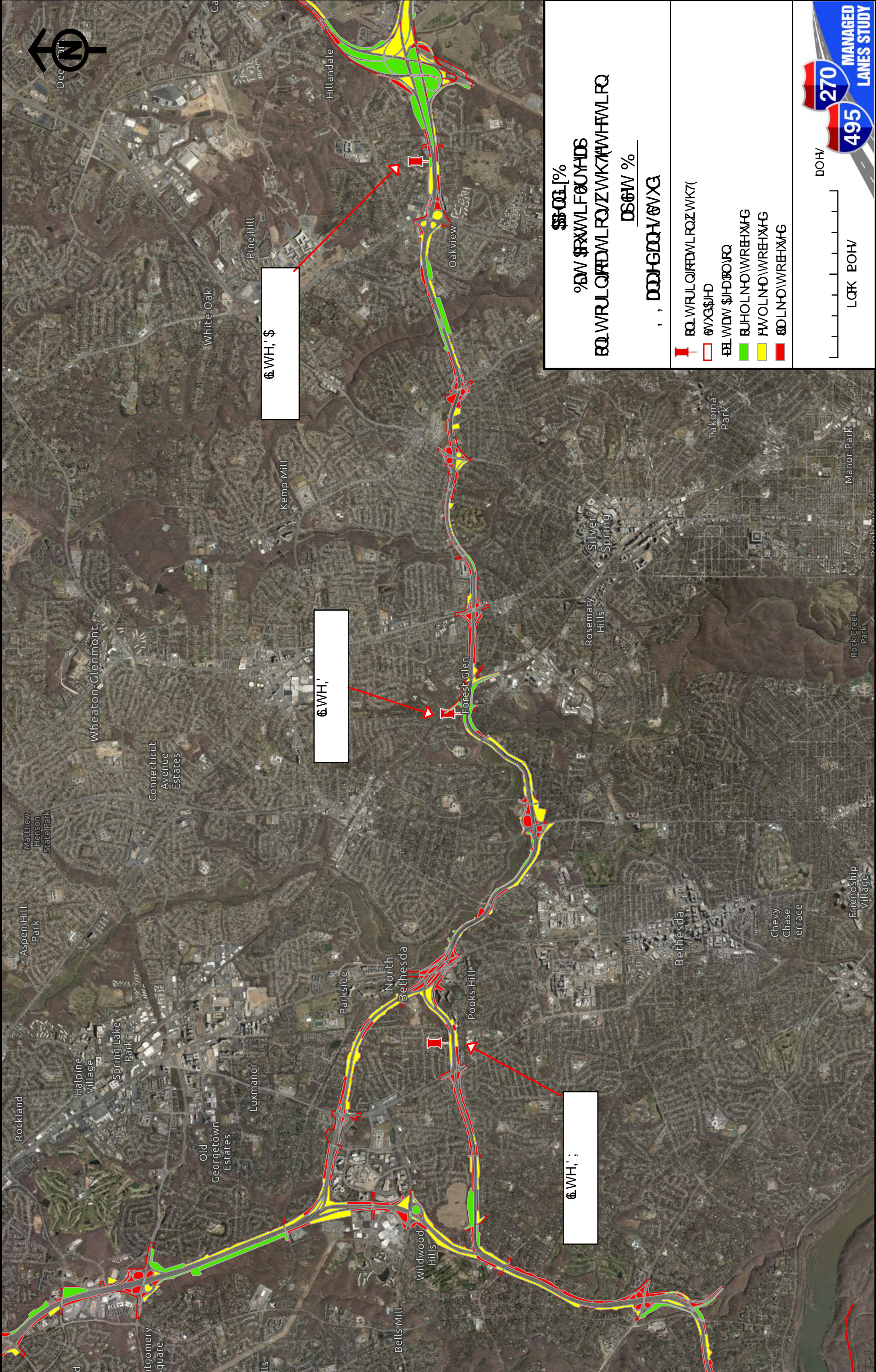
Appendix B:
Bat Acoustic Survey Map
Map Set A
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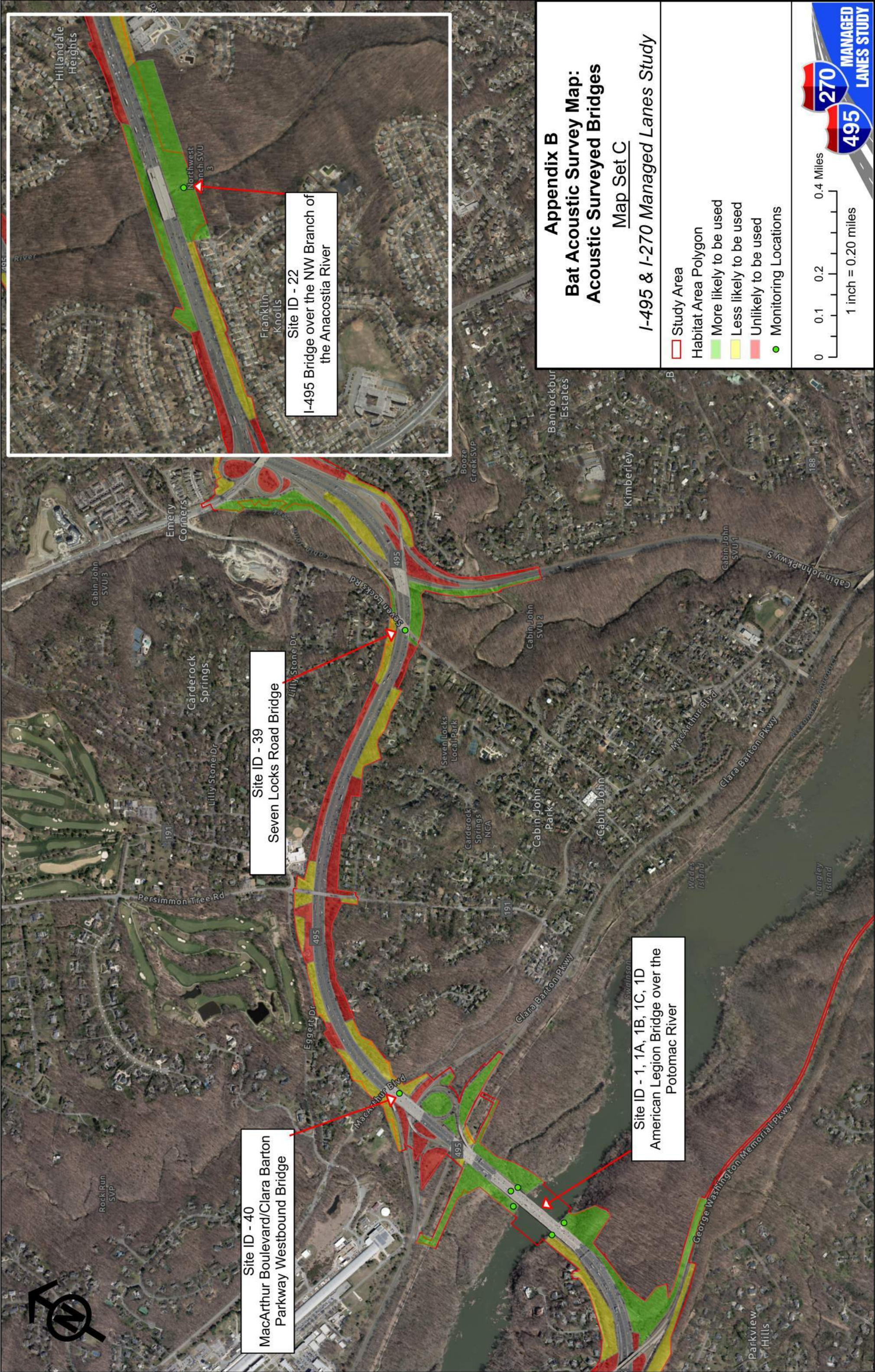
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APPENDIX C- HABITAT ASSESSMENT DATA SHEETS

INDIANA BAT HABITAT ASSESSMENT DATASHEET - FHT1

Project Name	I-495 & I-270 Managed Lanes Study
Township/Range/Section	Montgomery County, Prince Georges County
Lat Long/UTM/Zone:	39.0083938, -77.088533

Date	6/15/2020- 7/24/2020
Surveyor	RCL, EYG, SLY

Brief Project Description

The I-495 & I-270 Managed Lanes Study (MLS) project will address congestion from south of the American Legion Bridge in Fairfax County, VA to east of Woodrow Wilson Bridge and on I-270 from I-495 to I-370, including the east and west I-270 spurs. Bat habitat with the project area was classified into 3 categories, Forest Habitat Type (FHT) 1, 2, & 3. FHT 1 was the highest quality bat habitat identified. This data sheet summarizes Forest Habitat Type 1. Supplemental habitat information is available with the included report.

Project Area	Total Acres	Forest Acres	Open Acres
Project	651.5	590.5	61
Proposed Tree Removal (ac)	Completely Cleared	Partially Cleared (will leave trees)	Preserve Acres - no clearing

Vegetation Cover Types

Pre-Project	Post-Project
Red maple, American sycamore, American beech, Green ash, White oak, Sweetgum, Black willow, Japanese stiltgrass, Rice cut grass, Northern spicebush, False nettle, Highbush blueberry, Poison ivy	Final project clearing limits will determine post project cover types.

Vegetation Cover Types

Flight corridors to other forested areas?

Yes, there are flight corridors to other forested areas.

Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources)

Adjacent properties include forested areas, residential development, and roadside areas. There are several streams that run through these habitats.

Proximity to Public Land

What is the distance (mi) from the project area to forested public lands (e.g. national or state forests, national or state parks, conservation areas, wildlife management areas)?

Distance to public lands ranges from 0 mi (several of the points are within forested public lands) and 0.25 mi.

Sample Site Description

Sample Site No. (s): 1A, 1B, 1C, 2, 3A, 6, 8, 8A, 8B, 12, 13, 13A, 14, 18, 18A, 22, 24, 24A, 24B, 25, 26, 31A, 32, 33, 34A, 34D, 35, 35A, 36, 36A, 36B, 36C, 38, X3, X6, X7, X12, X14

Water Resources at Sample Site			
Stream Type (# and length)	Ephemeral	Intermittent	Perennial
	1 (157.21')	2 (359.72')	28 (16,545.16')
Pools/Ponds (# and size)	1 (12,395.2')		
Wetlands (approx. ac.)	Permanent	Yes	
		Seasonal	
	3.87	NA	
Describe existing condition of water sources: A majority of the water resources where the acoustic detectors were placed ranged from high to moderate quality resources. Many of the stream corridors were open and suitable for bats.			

Forest Resources at Sample Site

Closure/Density	Canopy (>50')	Midstory (20-50')	Understory (<20')
	6	5	4
Dominant Species of Mature Trees			
Sycamore, red maple, white oak, mixed red oaks, tulip poplar, sweetgum			
% Trees w/ Exfoliating Bark	~50%	~40%	~10%
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)
	10%	30%	60%

No. of Suitable Snags

NA

Is the habitat suitable for Indiana Bats?

Yes

INDIANA BAT HABITAT ASSESSMENT DATASHEET - FHT2

Project Name	I-495 & I-270 Managed Lanes Study
Township/Range/Section	Montgomery County, Prince Georges County
Lat Long/UTM/Zone:	39.0083938, -77.088533

Date	6/15/2020- 7/24/2020
Surveyor	RCL, EYG, SLY

Brief Project Description
The I-495 & I-270 Managed Lanes Study (MLS) project will address congestion from south of the American Legion Brige is Fairfax County, VA to east of Woodrow Wilson Bridge and on I-270 from I-495 to I-370, including the east and west I-270 spurs. Bat habitat with the project area was classified into 3 categories, Forest Habitat Type (FHT) 1, 2, & 3. FHT 2 was the marginal quality bat habitat identified. This data sheet summarizes Forest Habitat Type 2. Supplemental habitat information is available with the included report.

Project Area	Total Acres	Forest Acres	Open Acres
Project	780.8	674.8	102
Proposed Tree Removal (ac)	Completely Cleared	Partially Cleared (will leave trees)	Preserve Acres - no clearing

Vegetation Cover Types	Post-Project
Pre-Project	
Red maple, sweetgum, tulip poplar, Bradford pear, slippery elm, green ash, black cherry, common reed, skunk cabbage, poison ivy, northern spicebush, Virginia creeper, Southern arrow-wood, Japanese honeysuckle, broad-leaf cattail, narrow-leaf cattail, rice cut grass	Final project clearing limits will determine post project cover types.

Vegetation Cover Types
Flight corridors to other forested areas? Yes, there are flight corridors to other forested areas.
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources) Adjacent properties include forested areas, residential development, and roadside areas. There are several streams that run through these habitats.

Proximity to Public Land
What is the distance (mi) from the project area to forested public lands (e.g. national or state forests, national or state parks, conservation areas, wildlife management areas)? No public lands exist within FHT2.

Sample Site Description
Sample Site No. (s): 4, 5, 5A, 6A, 10, 11, 11A, 34B, 34E, 35B, 36D, X1, X2, X4, X5, X8, X10, X11, X13

Water Resources at Sample Site			
Stream Type (# and length)	Ephemeral	Intermittent	Perennial
	5 (179.66')	30 (2,545.55')	55 (10,785.33')
Pools/Ponds (# and size)	NA	Open and accessible to bats?	
		Yes	
Wetlands (approx. ac.)	Permanent	Seasonal	
	2.23	NA	
Describe existing condition of water sources: A majority of the water resources where the acoustic detectors were placed in moderate to low quality resources. Concrete lined channels were rated marginal quality bat habitat.			

Forest Resources at Sample Site			
Closure/Density	Canopy (>50')	Midstory (20-50')	Understory (<20')
	4	4	5
Dominant Species of Mature Trees	Tulip poplar, sycamore, red maple, and sweetgum		
% Trees w/ Exfoliating Bark	~40%	~20%	~10%
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)
	30%	60%	40%

No. of Suitable Snags	NA
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Is the habitat suitable for Indiana Bats?	Yes
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INDIANA BAT HABITAT ASSESSMENT DATASHEET - FHT3

Project Name	I-495 & I-270 Managed Lanes Study
Township/Range/Section	Montgomery County, Prince Georges County
Lat Long/UTM/Zone:	39 0083938, -77 088533

Date	6/15/2020- 7/24/2020
Surveyor	RCL, EYG, SLY

Brief Project Description

The I-495 & I-270 Managed Lanes Study (MLS) project will address congestion from south of the American Legion Brige is Fairfax County, VA to east of Woodrow Wilson Bridge and on I-270 from I-495 to I-370, including the east and west I-270 spurs. Bat habitat with the project area was classified into 3 categories, Forest Habitat Type (FHT) 1, 2, & 3. FHT 1 was the low quality bat habitat identified. This data sheet summarizes Forest Habitat Type 3. Supplemental habitat information is available with the included report.

Project Area	Total Acres	Forest Acres	Open Acres
Project	676.2	491.9	184.3
Proposed Tree Removal (ac)	Completely Cleared	Partially Cleared (will leave trees)	Preserve Acres - no clearing

Vegetation Cover Types

Pre-Project	Post-Project
Red maple, black locust, Virginia pine, Japanese stiltgrass, common green brier, grass sp.	Final project clearing limits will determine post project cover types.

Vegetation Cover Types

Flight corridors to other forested areas? Yes, there are flight corridors to other forested areas.	
Describe Adjacent Properties (e.g. forested, grassland, commercial or residential development, water sources) Adjacent properties include agricultural fields, residential developments, and public transportation facilities. Indian Creek run through Site 30.	

Proximity to Public Land

What is the distance (mi) from the project area to forested public lands (e.g. national or state forests, national or state parks, conservation areas, wildlife management areas)? No public lands within proximity to the two sites.	
--	--

Sample Site Description
Sample Site No. (s): 27, 30

Water Resources at Sample Site			
Stream Type	Ephemeral	Intermittent	Perennial
(# and length)	1 (422.43')	NA	1 (285.89')
Pools/Ponds (# and size)	NA	Open and accessible to bats? Yes	
Wetlands (approx. ac.)	Permanent	Seasonal	
	NA	NA	
Describe existing condition of water sources: The water resources that existed within the detection areas of Site 27 and 30 were moderate to low quality resources. Site 30 surveyed Indian Creek, but under I-495. Site 27 was an ephemeral channel, and considered a low quality habitat.			

Forest Resources at Sample Site			
Closure/Density	Canopy (>50')	Midstory (20-50')	Understory (<20')
	3	4	5
Dominant Species of Mature Trees	Red maple, black locust, and Virginia pine		
% Trees w/ Exfoliating Bark	~25%	~10%	0%
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)
	10%	40%	60%
No. of Suitable Snags	NA		

Is the habitat suitable for Indiana Bats?	No
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APPENDIX D- SURVEY SITE DATA SHEETS

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 1 State: MD County: Montgomery
Site Address: N side American Legion Memorial Bridge
Site Owner: National Park Service
Site Lat./Long. Coordinates: 38.9699389 N, 77.1793766 W
Site Photo Number: 2137
Person(s) Who Selected Acoustic Site: EVG/RCL
Person(s) who Deployed Detector: EVG/RCL/JS

Night 1 -

Survey Date: 7/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

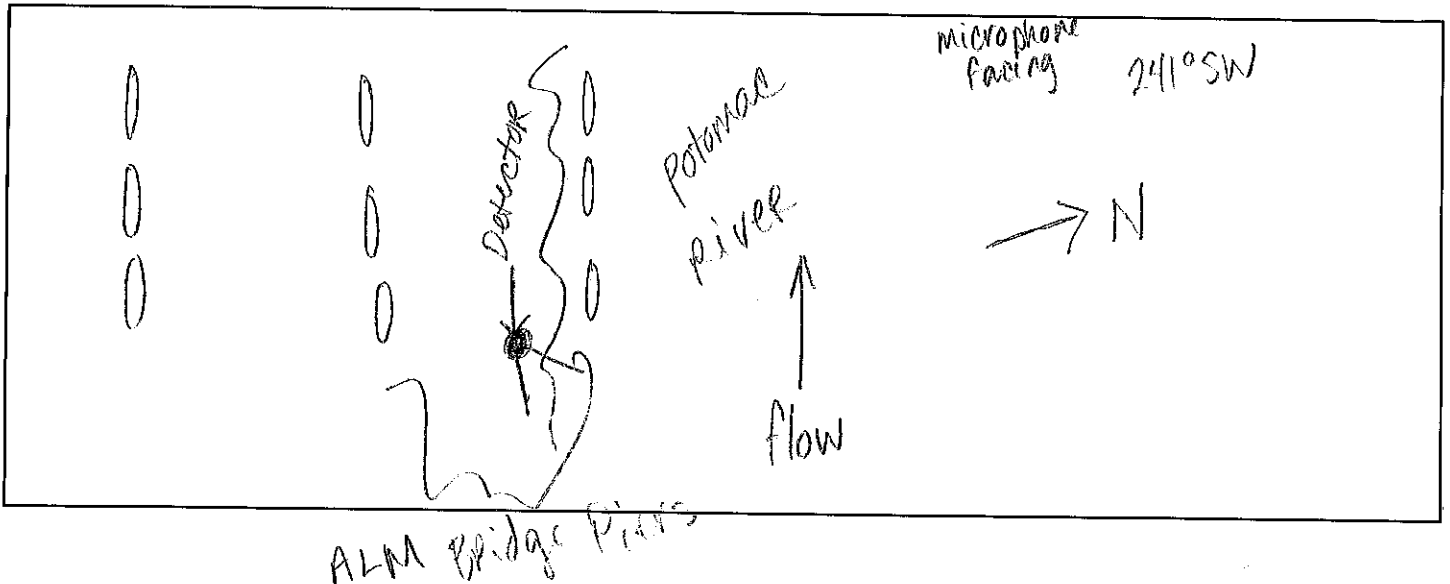
Survey Date: 7/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested floodplain

Description of Habitat:

forested flood plain of Potomac River and under the ALM Bridge.
Riparian area dominated by sycamore

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: Smm - 02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 7180 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 1A State: MD County: Montgomery
Site Address: N. Side American Legion Memorial Bridge
Site Owner: National Park Service
Site Lat./Long. Coordinates: 38.9696807 N, 77.1789317 W
Site Photo Number: 2135
Person(s) Who Selected Acoustic Site: EVG/RCL
Person(s) who Deployed Detector: EVN/JS/RCL

Night 1 -

Survey Date: 7/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

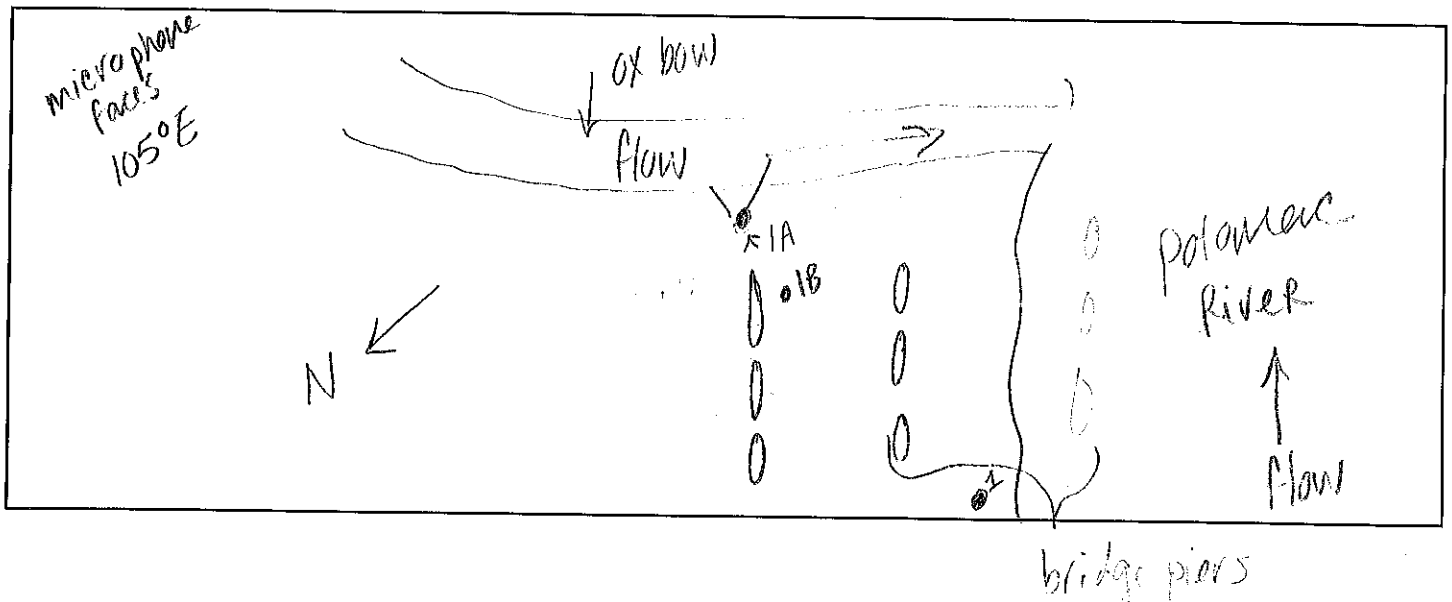
Survey Date: 7/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested floodplain

Description of Habitat:

Forested flood plain of Potomac River. Dominated by sycamore. Adjacent to ALM Bridge facing small

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~15 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 1B State: MD County: Montgomery
Site Address: N. side American Legion Memorial Bridge
Site Owner: National Park Service
Site Lat./Long. Coordinates: 38.9698511 N, 77.1798878 W
Site Photo Number: 2136
Person(s) Who Selected Acoustic Site: EVA/RCL
Person(s) who Deployed Detector: EVA/RCL/JS

Night 1 -

Survey Date: 7/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

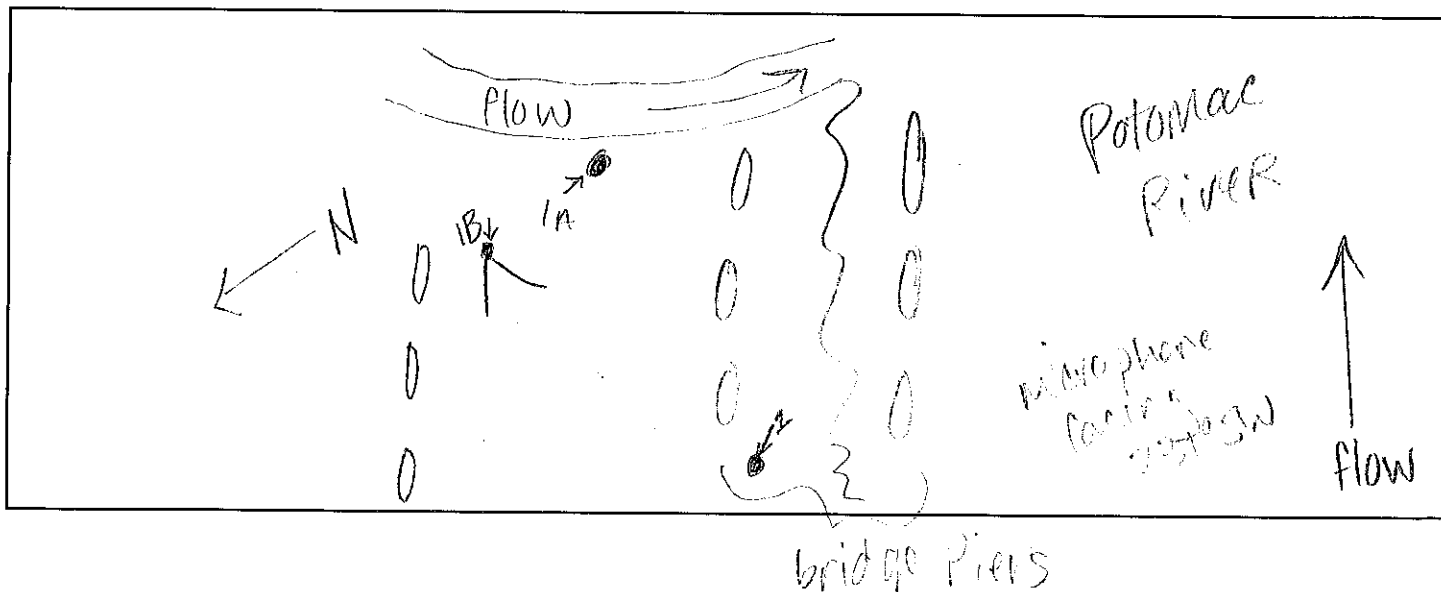
Survey Date: 7/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested floodplain

Description of Habitat:

Forested floodplain of Potomac River + under N side of ALM Bridge.
Large flight corridors under bridge. Riparian Area dominated by sycamore.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 1C State: VA County: Fairfax
Site Address: S. Side American Legion Memorial Bridge
Site Owner: National Park Service
Site Lat./Long. Coordinates: 38.9683540 N, 77.1793035 W
Site Photo Number: 2133
Person(s) Who Selected Acoustic Site: EVH / RCL
Person(s) who Deployed Detector: EVH / RCL / JS

Night 1 -

Survey Date: 07/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

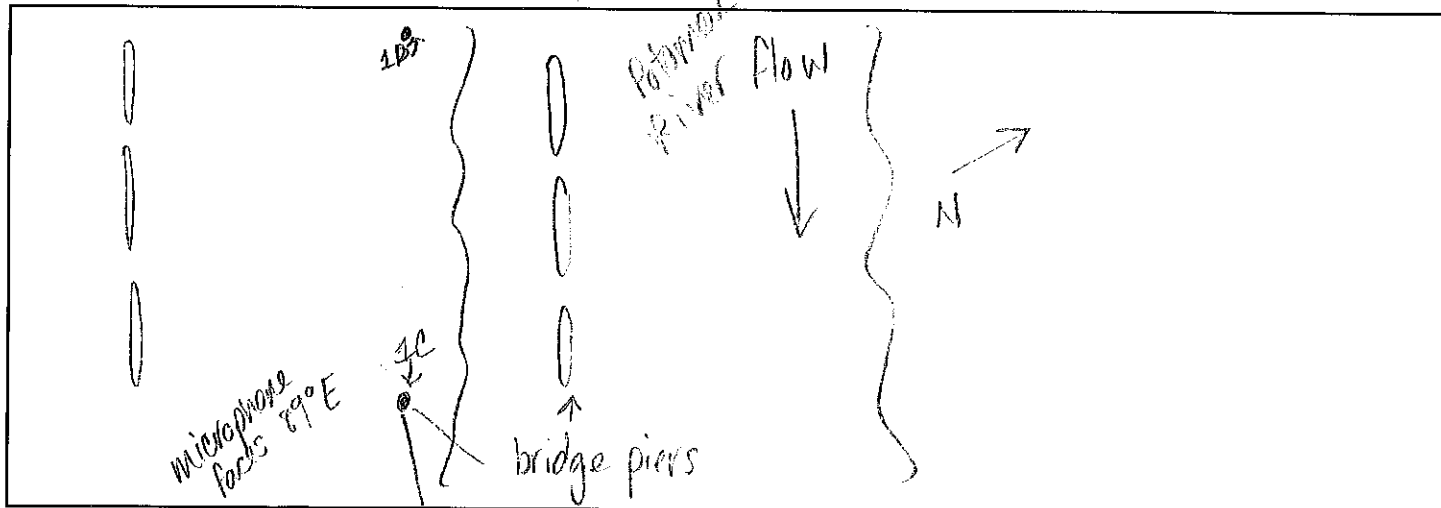
Survey Date: 07/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Floodplain

Description of Habitat:

Forested floodplain of Potomac River + under ALM Bridge. Area
Dominated by sycamore. Facing open, flat water

Habitat Site Sketch (include north arrow):



Detector Brand & Model: song meter SM4BAT ES

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): > 15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 1D State: VA County: Fairfax
Site Address: S. side American Legion Memorial Bridge
Site Owner: National Park Service
Site Lat./Long. Coordinates: 38.9684908 N, 77.1801302 W
Site Photo Number: 2134
Person(s) Who Selected Acoustic Site: ENG / RCL
Person(s) who Deployed Detector: ENG / RCL / JS

Night 1 -

Survey Date: 7/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

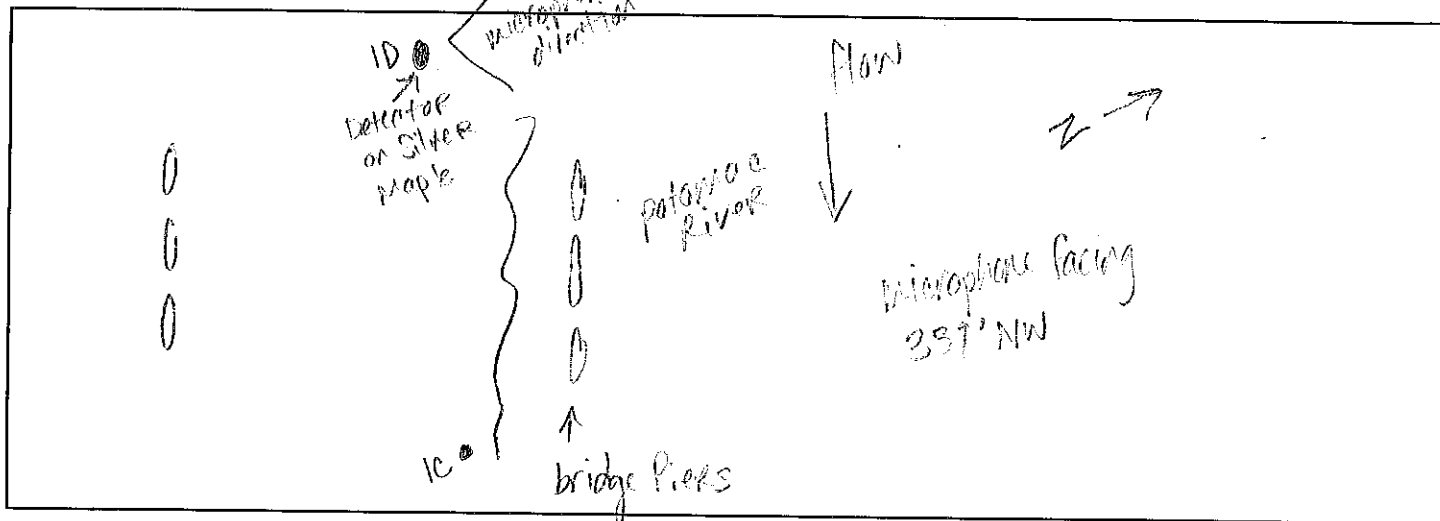
Survey Date: 7/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested flood plain

Description of Habitat:

On floodplain w/ microphone facing open flat water. Nearby areas forested and dominated by sycamore. Adjacent to bridge

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 7.5 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 2 State: MD County: MONTGOMERY
Site Address: APPX 230 ft of interchange of NB I-495 & CABIN JOHN HWY
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 38.9839903 N, -77.1588781 W
Site Photo Number: IMG0098 - 0099
Person(s) Who Selected Acoustic Site: EVH / RCL
Person(s) who Deployed Detector: EVH / RCL

Night 1 -

Survey Date: 6/17/2020
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

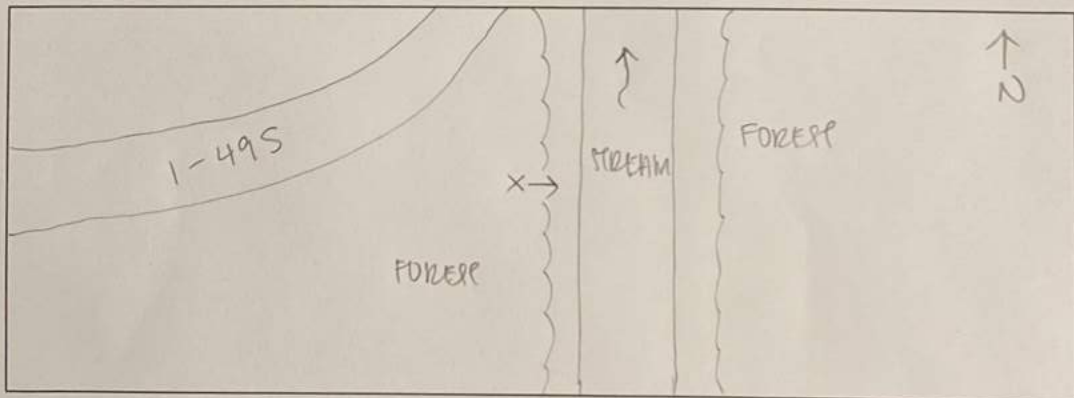
Survey Date: 6/18/2020
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Edge of stream

Description of Habitat:

Edge of stream (Cabin John creek).

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METEN SMUBAT
Microphone Brand & Model: SMM-U2
Microphone Type: Omnidirectional
Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 1 meters
Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 3 State: MD County: Montgomery
 Site Address: Approx. 280 ft NE of interchange of Thonick Rd and Revers Look Rd.
 Site Owner: MDOT SHA
 Site Lat./Long. Coordinates: 38.9855114 N, -77.1591773 W
 Site Photo Number: IMG0096-0097
 Person(s) Who Selected Acoustic Site: EVG/RCU
 Person(s) who Deployed Detector: EVG/RCU

Night 1 -

Survey Date: 06/17/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45

General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

Survey Date: 06/18/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45

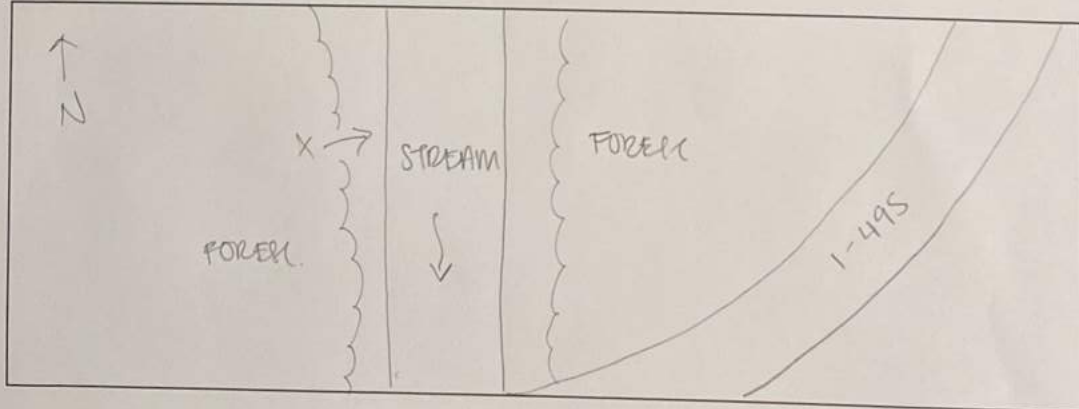
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Edge of stream

Description of Habitat:

Edge of stream (Cabin John Creek). Lots of invasive coverage

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN MEIER SMYBAT

Microphone Brand & Model: SMM-12

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 1 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY
Bat Acoustic Survey Record

Site ID Number: 3A State: MD County: Montgomery
Site Address: Approx. 0.12 mi SE of ramp from River Road to SB 1-495
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 38.9901562 N, -77.1590547 W
Site Photo Number: MAP 0100 - 0101
Person(s) Who Selected Acoustic Site: EVH/ECU
Person(s) who Deployed Detector: EVH/ECU

Night 1 -

Survey Date: 06/17/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

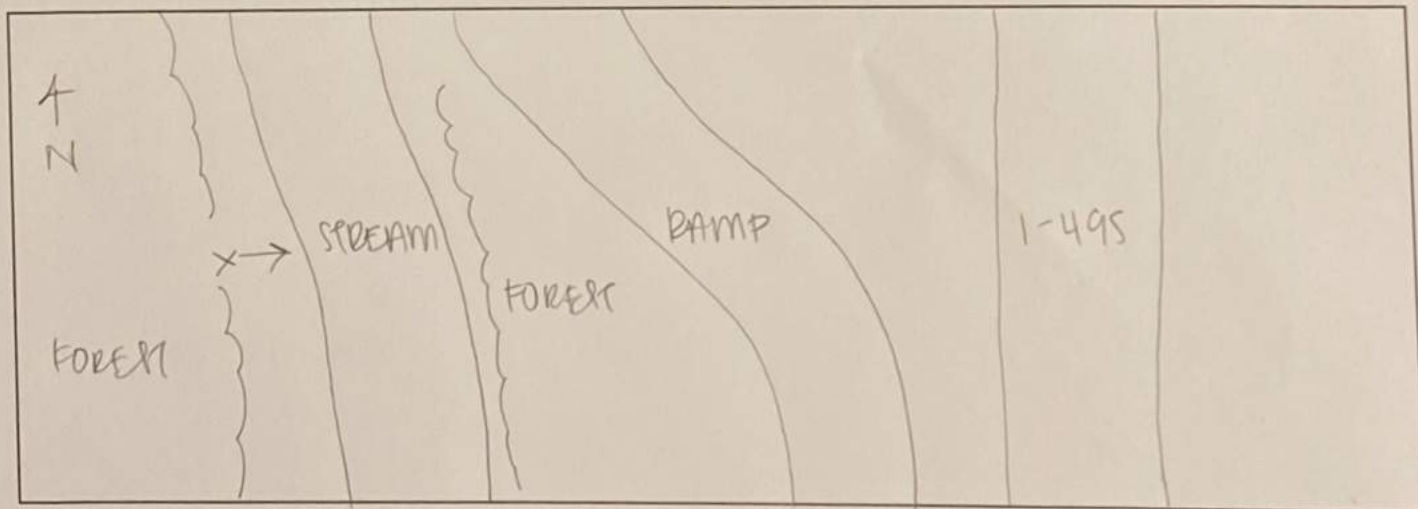
Survey Date: 06/18/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): FORESTED STREAM

Description of Habitat:

forested stream located by ramp onto 1-495. ground cover contains invasives.

Habitat Site Sketch (include north arrow):



87C 34
Detector Brand & Model: SONN METER SM4BAT

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 1.5 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): <1 meters

Horizontal Orientation of Microphone: ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 4 State: MD County: MONTGOMERY
 Site Address: WB 1-495, approximately 0.17 mi N of interchange with WB of
 Site Owner: UNKNOWN RIVER RD
 Site Lat./Long. Coordinates: 38.9930381 N, 77.1581627 W
 Site Photo Number: 05-06
 Person(s) Who Selected Acoustic Site: EVG, RCL
 Person(s) who Deployed Detector: EVG, JS

Night 1 -

Survey Date: 7/23/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:51
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

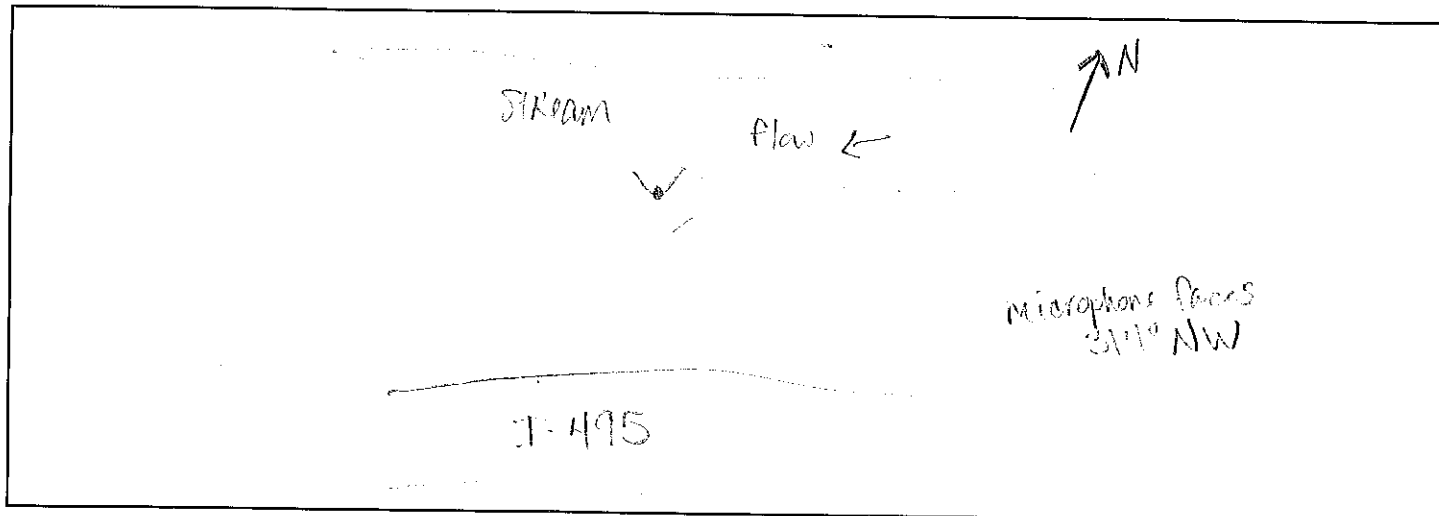
Survey Date: 7/24/20
 Survey Start Time (military): _____ Survey End Time (military): 06:51
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested riparian area next to stream

Description of Habitat:

Isolated fragment between 1495 and stream. Stream is concrete lined trapezoidal channel.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4 BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: Omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): <0.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00m: 15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 5 State: MD County: Montgomery
Site Address: SB 1-270, approx. 0.4mi S of interchange with EB Democracy Blvd
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.082653 N, -77.1471657 W
Site Photo Number: 0084-0085
Person(s) Who Selected Acoustic Site: EVH/REL
Person(s) who Deployed Detector: EVH/REL

Night 1 -

Survey Date: 06/15/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

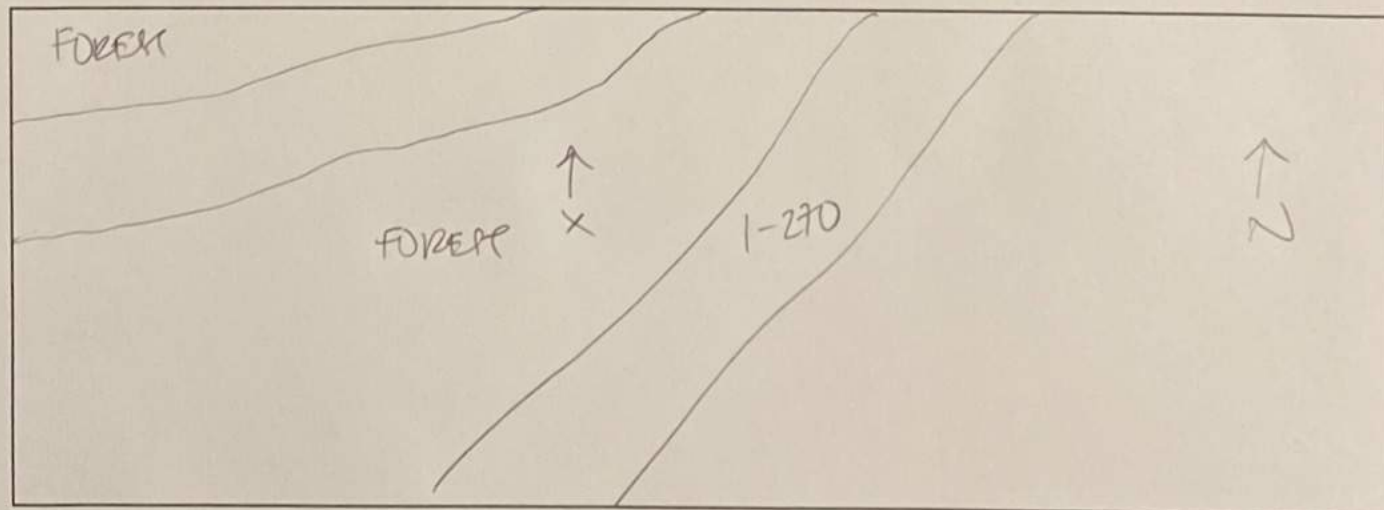
Night 2 -

Survey Date: 06/16/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; ThunderstormsHabitat Type (e.g. forested stream, floodplain): FOREST

Description of Habitat:

Tupelo poplar forest with a lot of invasive in the understorey.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METEK SM4BAT

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 6 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 m : 15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 5A State: MD County: Montgomery
Site Address: Approx. 0.54 min of Jct of Wethersden Pk. and NB I-270 in
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0323193 N, -77.1422349 W
Site Photo Number: 0082-0083
Person(s) Who Selected Acoustic Site: RCL/EVH
Person(s) who Deployed Detector: RCL/EVH

Night 1 -

Survey Date: 06/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

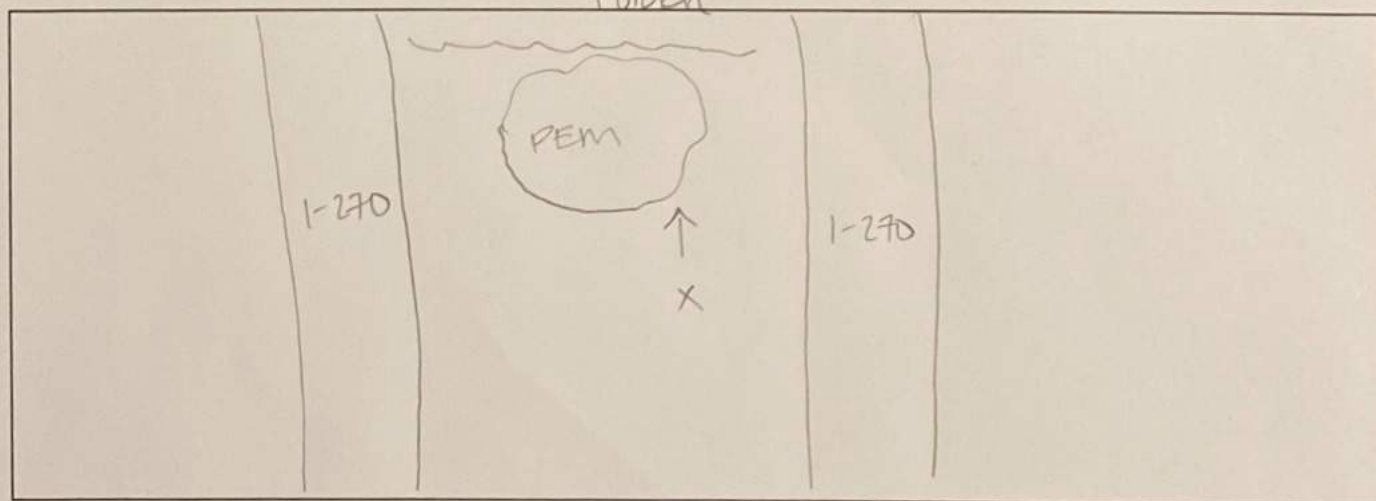
Survey Date: 06/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): PEM + FOREST

Description of Habitat:

Emergent habitat filled with cattail and forest located behind PEM
A lot of invasives located in herbaceous layer.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONI METER SM4BAP
Microphone Brand & Model: SMM-U2
Microphone Type: Omnidirectional
Type of Weatherproofing: N/A
Microphone Height Above Ground-level Vegetation: 3 meters
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): > 15 meters
Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °
Calls Collected In (circle one): Full Spectrum; Zero Crossing
Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	35
Max Length	00 m: 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 6A State: MD County: MONTGOMERY
Site Address: NB I-270, APPROX. 150ft N of TUCKERMAN LANE
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0383612 N, -77.1452406 W
Site Photo Number: 0088 - 0089
Person(s) Who Selected Acoustic Site: RCL/EVG
Person(s) who Deployed Detector: RCL/EVG

Night 1 -

Survey Date: 06/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

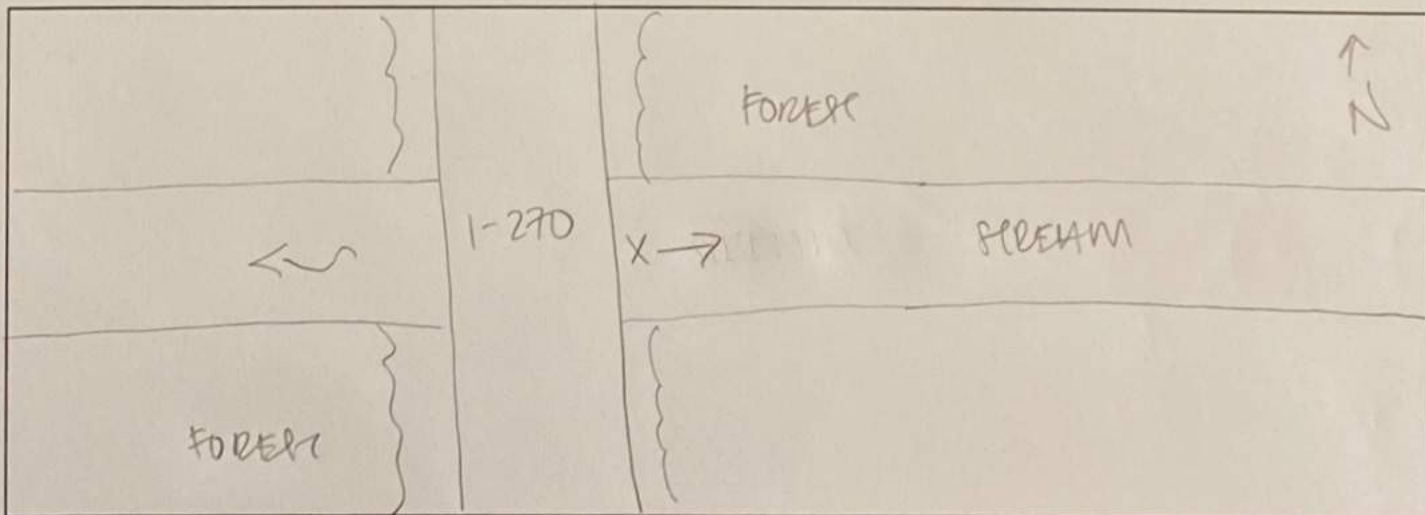
Survey Date: 06/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): EDGE OF STREAM

Description of Habitat:

FORESTED STREAM DOMINATED BY SILKMOORE. INVADED AND
POISON IVY DOMINATED.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONIX METER SM4BATMicrophone Brand & Model: SMM-02Microphone Type: OmnidirectionalType of Weatherproofing: N/AMicrophone Height Above Ground-level Vegetation: 1.5 metersDistance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 1 metersHorizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3s
Max Length	00m: 15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 6 State: MD County: MONTGOMERY
Site Address: SB 1-270, APPRX. 202 ft NW of Jct of DUCKERMAN LANE
Site Owner: MNAPPC
Site Lat./Long. Coordinates: 39.0381761 N, -77.1464503 W
Site Photo Number: 0090 - 0092
Person(s) Who Selected Acoustic Site: RCL/EVH
Person(s) who Deployed Detector: EVH/RCL

Night 1 -

Survey Date: 06/15/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45General Weather (circle one): Clear, Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

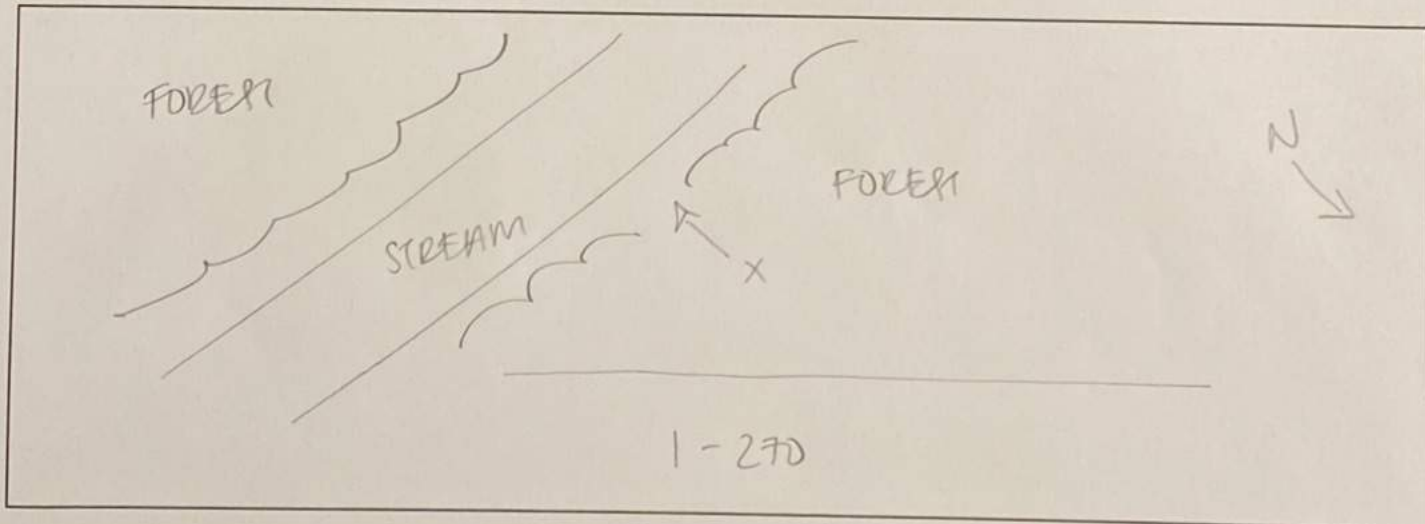
Night 2 -

Survey Date: 06/16/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45General Weather (circle one): Clear, Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; ThunderstormsHabitat Type (e.g. forested stream, floodplain): FLOODPLAIN

Description of Habitat:

FLOODPLAIN OF STREAM (OLD FARM CREEK)

Habitat Site Sketch (include north arrow):



8AC 6
Detector Brand & Model: SUNN METER SM4BAT

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 1 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	DN
Sample Rate	256 KHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 8 State: MD County: Montgomery
Site Address: NB I-270, approx. 0.1 mi S of ramp to EB Montrose Rd.
Site Owner: Montgomery County
Site Lat./Long. Coordinates: 39.0526719 N, 77.1521895 W
Site Photo Number: 6768
Person(s) Who Selected Acoustic Site: RCL/ENH
Person(s) who Deployed Detector: KS/ENH

Night 1 -

Survey Date: 7/6/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms

~7PM. cleared up throughout the night

Night 2 -

Survey Date: 7/7/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

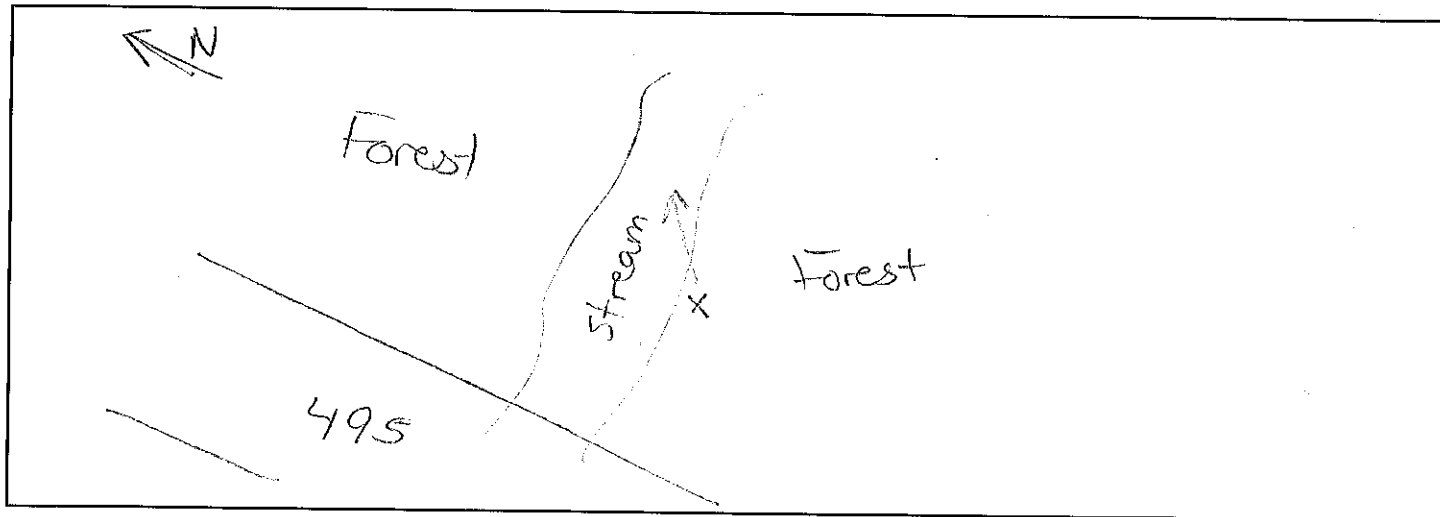
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Forest of sycamore/red maple, lots of vines, adjacent to stream. Stiff grass, barberry, mf rose present.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeters SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~ 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 3 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 8A State: MD County: Montgomery
Site Address: NB I-270, approx. 0.25 mi N of junction with Wootton Pkwy
Site Owner: TOWER-DAWSON LLC
Site Lat./Long. Coordinates: 39.0698078 N, 77.1588597 W
Site Photo Number: 6769
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: KS/EYG

Night 1 -

Survey Date: 7/6/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~7PM cleared up throughout the night

Night 2 -

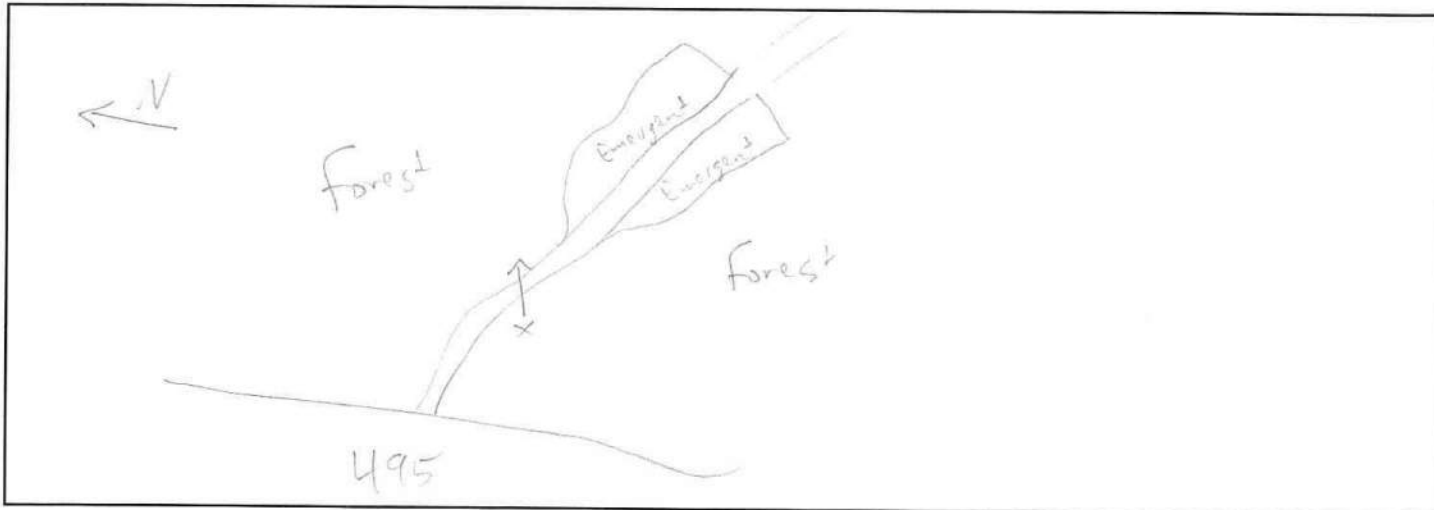
Survey Date: 7/7/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Forest of red maple, sycamore. C. orbiculatus and T. radicans abundant vines.
Silt/grass dominated ground cover.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: song meters SM4BAT FS

Microphone Brand & Model: SM1M-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~3 meters

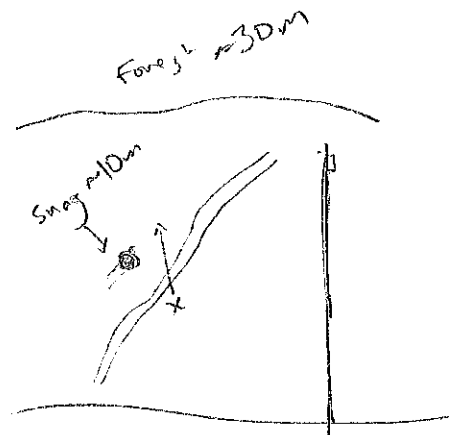
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~4.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE



MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 8B State: MD County: MONTGOMERY
 Site Address: NB I-270, approximately 410 ft S of W Glade Dr (Rockville Senior Center Park)
 Site Owner: CITY OF ROCKVILLE
 Site Lat./Long. Coordinates: 39.1003102 N, 77.1782183 W
 Site Photo Number: 03-04
 Person(s) Who Selected Acoustic Site: EVG, RCL
 Person(s) who Deployed Detector: EVG, JS

Night 1 -

Survey Date: 7/22/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms cleared up overnight

Night 2 -

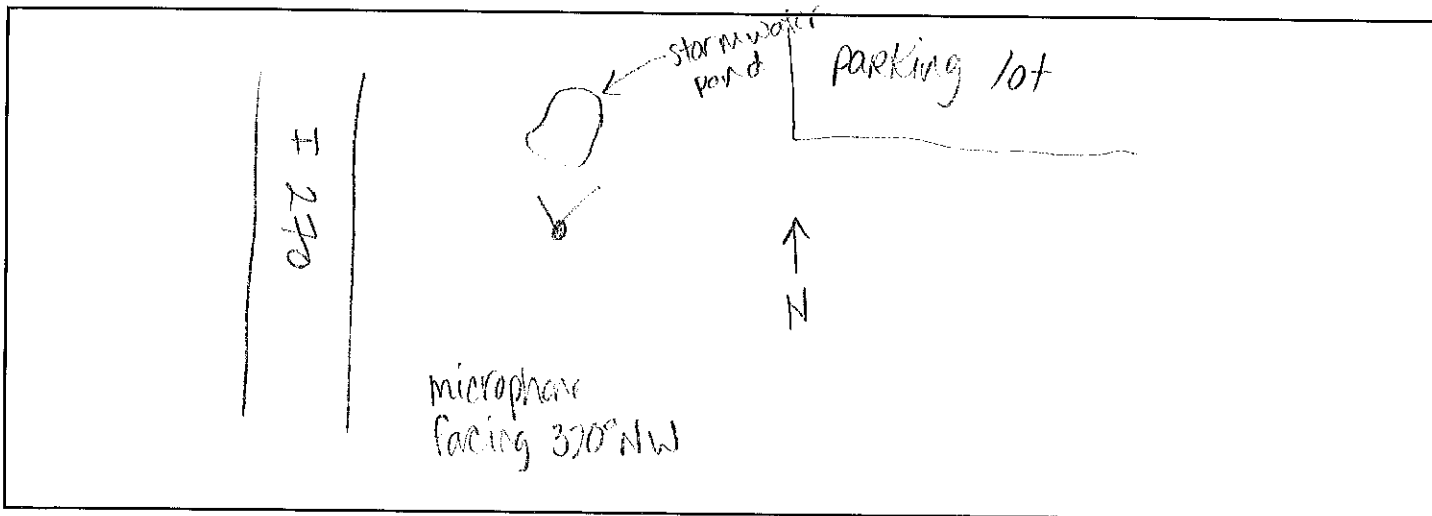
Survey Date: 7/23/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forest

Description of Habitat:

Forested area adjacent to I-270 + Senior care center. Mature Decid.
 trees w/ several large white oaks

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 0.5 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 9 State: MD County: Montgomery
Site Address: Along SB I-270, approximately 225 ft NW on ramp to WB I-370
Site Owner: City of Emmelsburg
Site Lat./Long. Coordinates: 39.1233434 N, 77.2507698 W
Site Photo Number: 01-02
Person(s) Who Selected Acoustic Site: EM, RCL
Person(s) who Deployed Detector: EM, JS

Night 1 -

Survey Date: 7/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

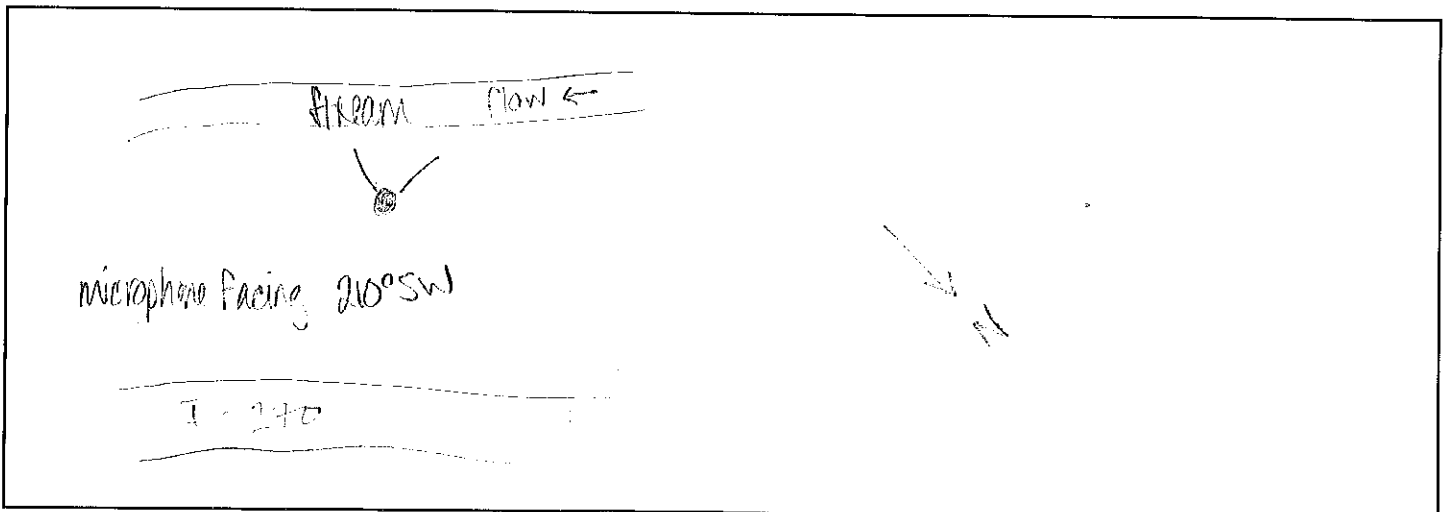
Survey Date: 7/26/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested stream

Description of Habitat:

Decid forested riparian area 75% to stream + residential development

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONGmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): > 6 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s .
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 11 State: MD County: MONTGOMERY
Site Address: Approx 0.75 mi W of interchange of Old Georgetown Rd & WB 1-270
Site Owner: Heritage Walk Homes Corp.
Site Lat./Long. Coordinates: 39.0329337 N, -77.1372166 W
Site Photo Number: 0086 - 0087
Person(s) Who Selected Acoustic Site: EVH / RCL
Person(s) who Deployed Detector: EVH / RCL

Night 1 -

Survey Date: 06/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

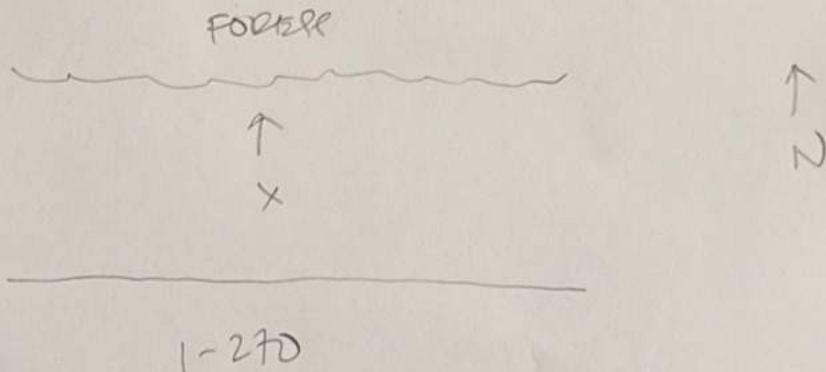
Survey Date: 06/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): FOREST

Description of Habitat:

FOREST WITH SYCAMORES AND TUP LOUPE. HEAVY HERBACEOUS COVER.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONIX METEK SM4BAT

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): > 6 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	35
Max Length	00m: 155
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 11A State: MD County: Montgomery
 Site Address: Approx. 0.6 mi E of interchange of NB old Georgetown Rd and SB 1-270
 Site Owner: Audino 3 Griffith Ltd
 Site Lat./Long. Coordinates: 39.0288428 N, 77.1175406 W
 Site Photo Number: 0106-0107
 Person(s) Who Selected Acoustic Site: RCL/EMG
 Person(s) who Deployed Detector: RCL/EMG

Night 1 -

Survey Date: 06/17/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

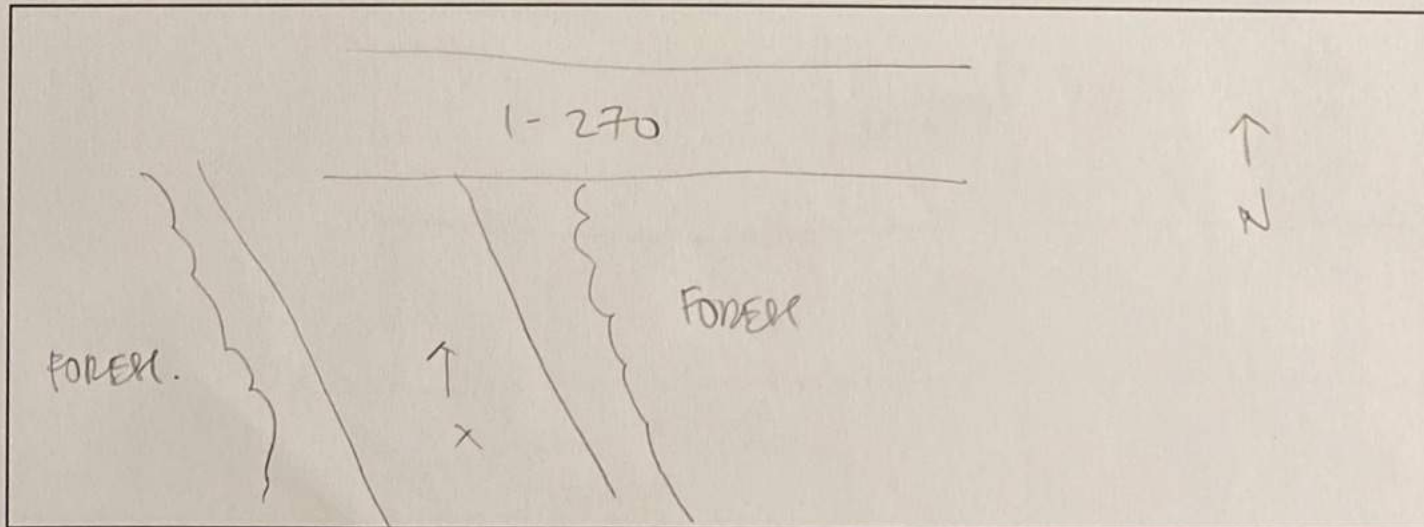
Survey Date: 06/18/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): IN STREAM BED.

Description of Habitat:

FORESTED STREAM WITH UNDERWATER BRANCH. PERENNIAL TRAIL TO ROCK CREEK.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONG METER SM4BAT
 Microphone Brand & Model: SMM-V2
 Microphone Type: omnidirectional
 Type of Weatherproofing: N/A
 Microphone Height Above Ground-level Vegetation: 3 meters
 Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 3 meters
 Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °
 Calls Collected In (circle one): Full Spectrum, Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 m : 15s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 12 State: MD County: MONTGOMERY
Site Address: APPROX. 0.3 mi of interchange of WB I-495 & NB ROCKVILLE PIKE
Site Owner: MNCPPE
Site Lat./Long. Coordinates: 39.0167136 N, 77.0969136 W
Site Photo Number: 6773, 6774
Person(s) Who Selected Acoustic Site: RCL/EYK
Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~ 7 PM. cleared up throughout the night.

Night 2 -

Survey Date: 7/7/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

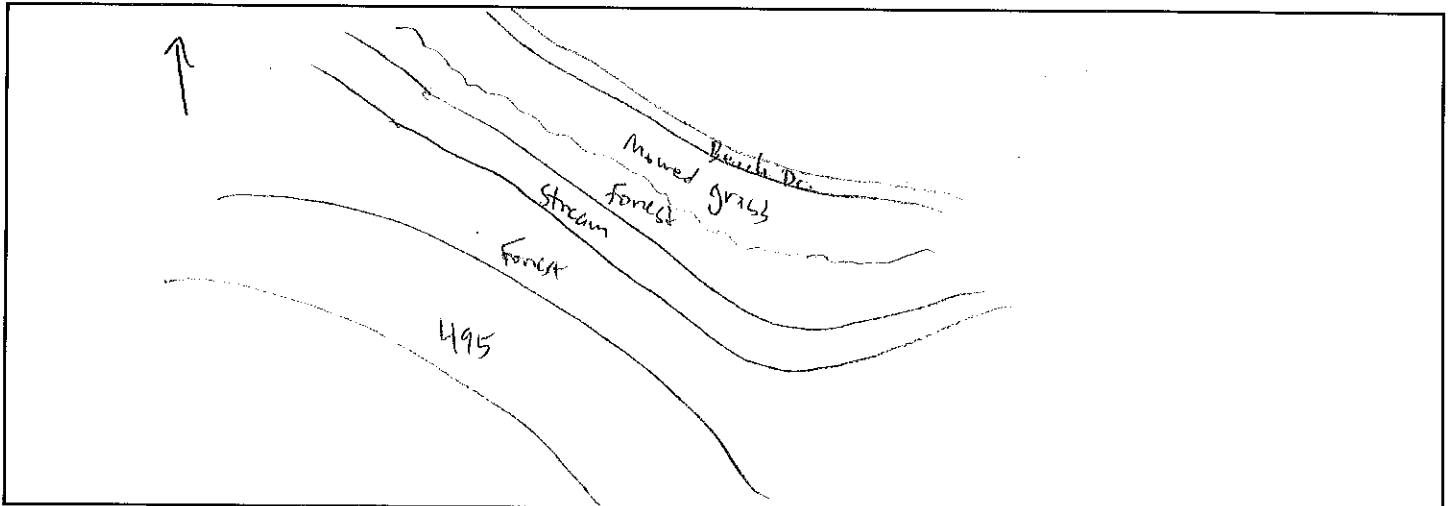
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested stream

Description of Habitat:

Forest canopy consisting of black locust, black walnut, sycamore, and box elder.
Understory of boxelder and honeysuckle.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONG METER SM4BAT FS

Microphone Brand & Model: SMM-D2

Microphone Type: OMNIDIRECTIONAL

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

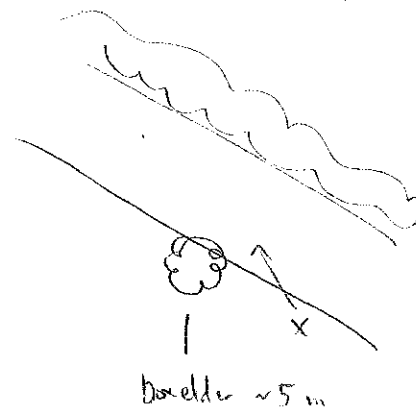
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE



I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 13 State: MD County: Montgomery
Site Address: approx. 0.21 mi NW of junction of Cedar Ln & WB I-495
Site Owner: MNCPPE
Site Lat./Long. Coordinates: 39.0131702 N, 77.0934304 W
Site Photo Number: 6772
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~7PM. cleared up throughout the night

Night 2 -

Survey Date: 7/7/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

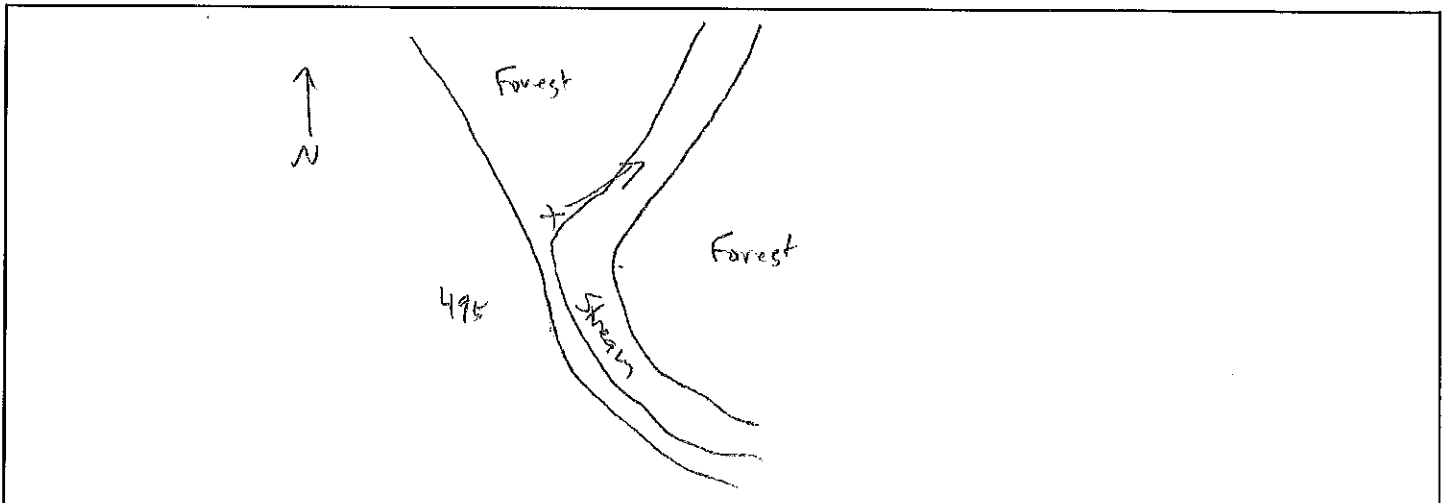
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Forest dominated by black walnut with boxelder and sycamore.
Privet, honeysuckle, porcelain berry, and stiltgrass dominant in understory.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SM-M-V2

Microphone Type: OMNIDIRECTIONAL

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~30 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHZ
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHZ
Trigger Level	12 db
Trigger Window	3s
Max Length	00m : 15s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 13A State: MD County: Montgomery
Site Address: Approx. 0.13 mi E of junction of Cedar Ln and NB I-495
Site Owner: MNCPPE
Site Lat./Long. Coordinates: 39.0111447 N, 77.0894464 W
Site Photo Number: 6775
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~ 7 PM. cleared up throughout the night.

Night 2 -

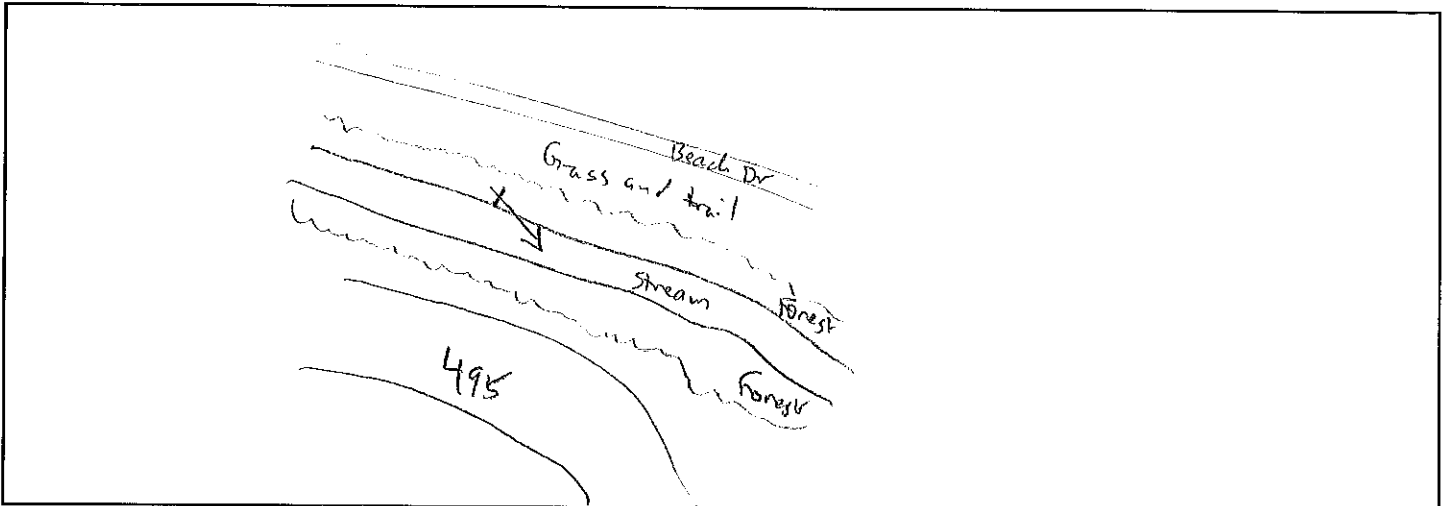
Survey Date: 7/7/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Narrow forested riparian area with boulder, silver maple, cherry and mulberry.
Lots of grape vine and porochuberry.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~10 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 14 State: MD County: MONTGOMERY
Site Address: APPROX. 0.36 mi NW of INTERCHANGE of SB CONN. AVE and WB I-495.
Site Owner: MNCPPE
Site Lat./Long. Coordinates: 39.0070708 N, 77.0849557 W
Site Photo Number: 6771
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~ 7 PM, cleared up throughout the night.

Night 2 -

Survey Date: 7/7/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

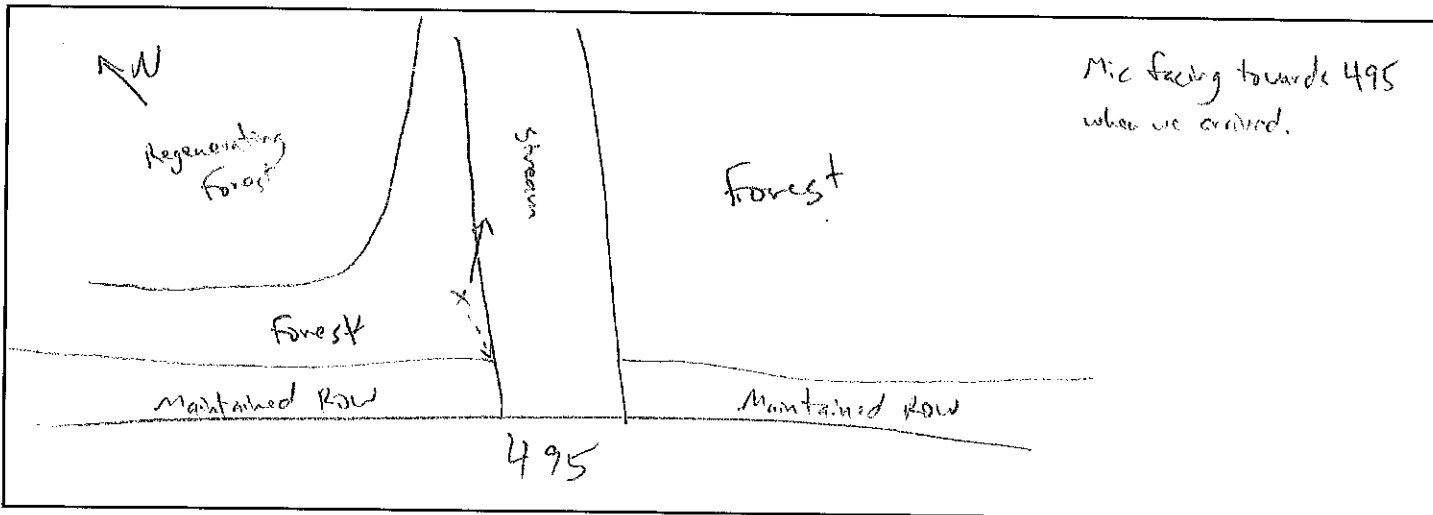
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Forest of Sycamore, Black walnut, elm, and boxelder. Privet in the understory.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONGmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: OMNIDIRECTIONAL

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~10m meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHZ
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHZ
Trigger Level	12 db
Trigger Window	35
Max Length	00 m: 15 S
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 15 State: MD County: MONTGOMERY

Site Address: NB CONNECTICUT AVE., APPROX. 0.16 mi N of I-495.

Site Owner: MNCPPE

Site Lat./Long. Coordinates: 39.0072428 N, 77.0792411 W

Site Photo Number: 6776

Person(s) Who Selected Acoustic Site: RCU/EXH

Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~ 7PM, cleared up throughout the night

Night 2 -

Survey Date: 7/7/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

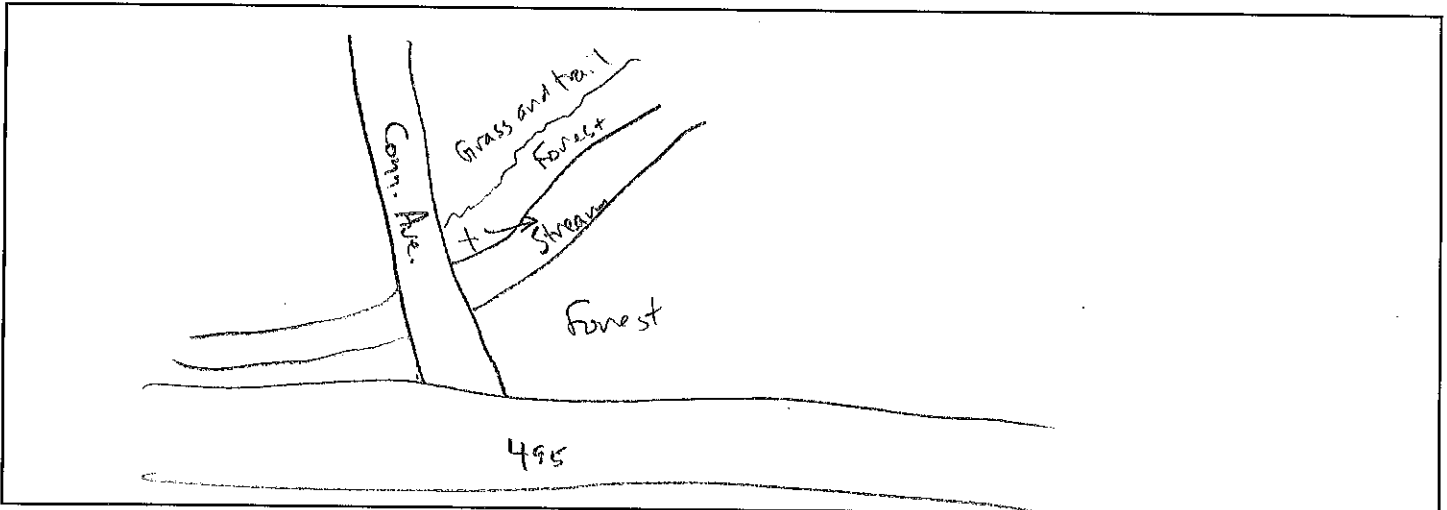
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Canopy of boxelder, sycamore, and cottonwood. Understory of honeysuckle, porcelainberry, and boxelder.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT ES

Microphone Brand & Model: SMM-U2

Microphone Type: Omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~30 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00m:15s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 16 State: MD County: Montgomery
Site Address: WB I-495, 0.4 mi E of interchange with Kensington Pkwy
Site Owner: MNCPPC
Site Lat./Long. Coordinates: 39.0074906 N, 77.0684735 W
Site Photo Number: 6778
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~7PM cleared up throughout the night

Night 2 -

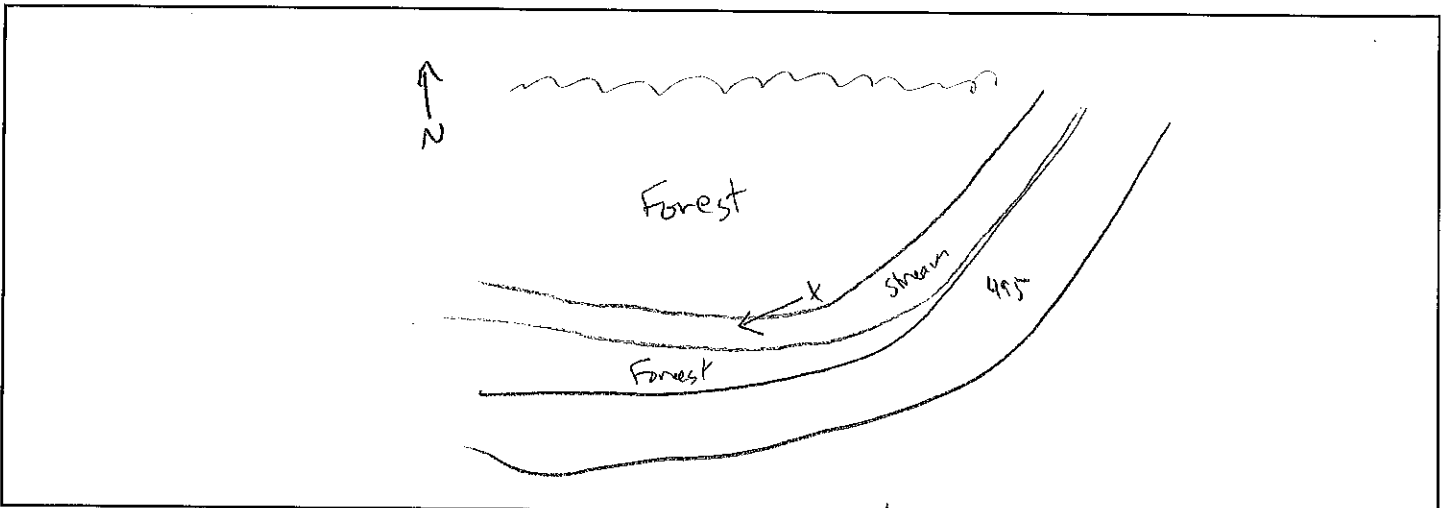
Survey Date: 7/7/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Borelder and sycamore dominant in the canopy. Porcelainberry and stiltgrass dominant in herbaceous layer. Poison ivy abundant.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Song meter SM4 BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

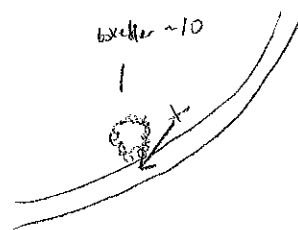
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~10 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE



I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 17 State: MD County: Montgomery
Site Address: WB I-495, approx. 340 ft of junction of Beeth Drive.
Site Owner: MNCPPC
Site Lat./Long. Coordinates: 39.0117261 N, 77.0643680 W
Site Photo Number: 1174-1175
Person(s) Who Selected Acoustic Site: EYG/JS/RCL
Person(s) who Deployed Detector: JS/SLY

Night 1 - Unit 6

Survey Date: 7/9/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 7/10/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

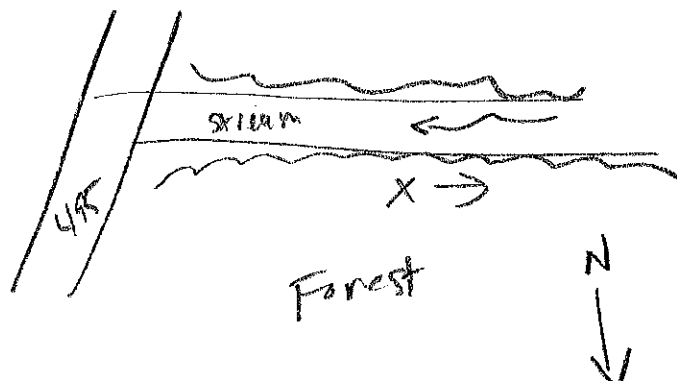
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Floodplain

Description of Habitat:

Floodplain forest on stream bank. Red maple forest w/
bush honeysuckle in undergrowth

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONG METER SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~9 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 18 State: MD County: Montgomery

Site Address: WB 1-495, approx 580 ft N of junction with Under Ln.

Site Owner: MNCPPC

Site Lat./Long. Coordinates: 39.0146880 N, 77.0592498 W

Site Photo Number: 0108

Person(s) Who Selected Acoustic Site: EYG/RCL

Person(s) who Deployed Detector: JS/SLY

Night 1 -

Survey Date: 7/9/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 7/10/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

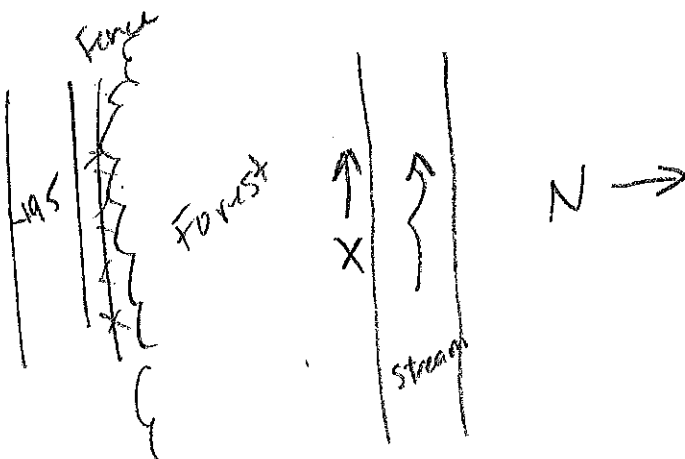
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Beech / tulip poplar forest along stream - not much
in understory

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONIX METEK SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~12 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 18A State: MD County: Montgomery
Site Address: Approximately 402 ft NE of Jct of Woodley Ave & Linden Ln
Site Owner: NATIONAL PARK SEMINARY
Site Lat./Long. Coordinates: 39.0135289 N, 77.0571915 W
Site Photo Number: 08-109
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: EYG/JS

Night 1 -

Survey Date: 7/23/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms cleared out overnight

Night 2 -

Survey Date: 7/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

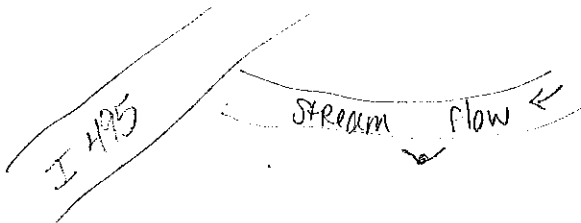
Habitat Type (e.g. forested stream, floodplain): forested stream

Description of Habitat:

forested riparian area adjacent to seminary +

Habitat Site Sketch (include north arrow):

microphone facing 301°NW



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: Omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 1 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 20 State: MD County: Montgomery
Site Address: EB I-495, APPROX. 300 ft W OF SHILOH CREEK BRIDGE
Site Owner: MNCPCC
Site Lat./Long. Coordinates: 39.0145896 N, 77.0319662 W
Site Photo Number: 1776 - 1777
Person(s) Who Selected Acoustic Site: EYG/RCL
Person(s) who Deployed Detector: JS/SLY

Night 1 -

Box #10

Survey Date: 7/9/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 7/10/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

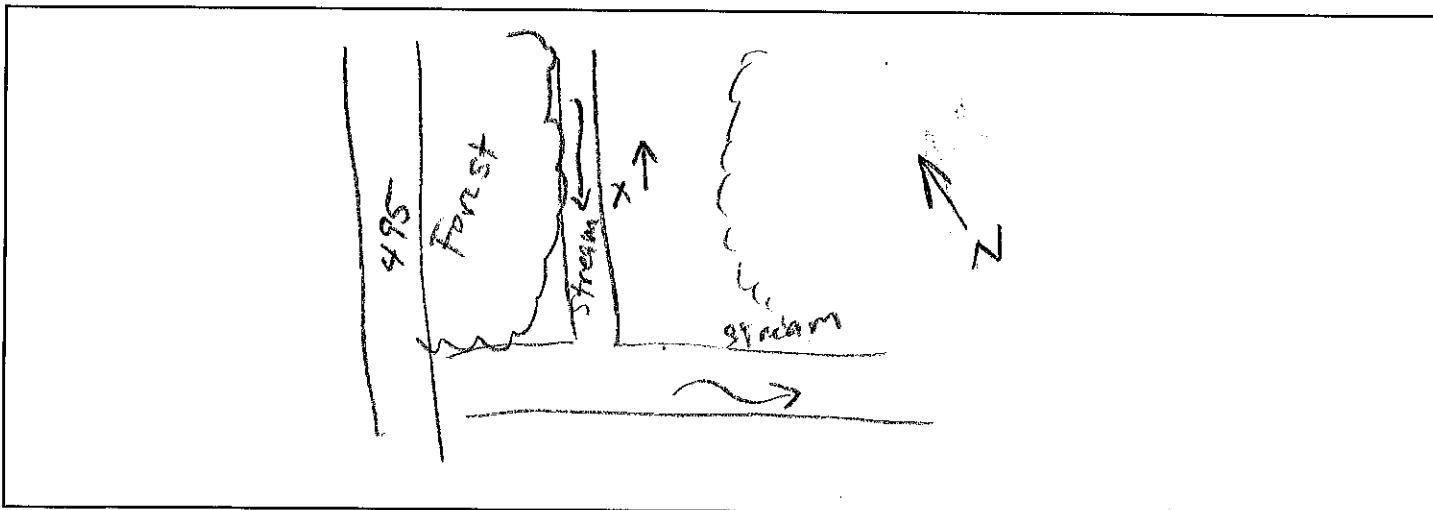
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Open floodplain

Description of Habitat:

Open floodplain near channel going into main stream

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONG METEK SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~6 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 22 State: MD County: MONTGOMERY
Site Address: EB I-495, 250-ft S of Bridge on the NW BRANCH of ANACOSTIA RIVER.
Site Owner: MNCPPC
Site Lat./Long. Coordinates: 39.0169995 N, 76.9939044 W
Site Photo Number: 0109
Person(s) Who Selected Acoustic Site: EYG / REL
Person(s) who Deployed Detector: JS / SLY

Night 1 -

Survey Date: 7/9/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

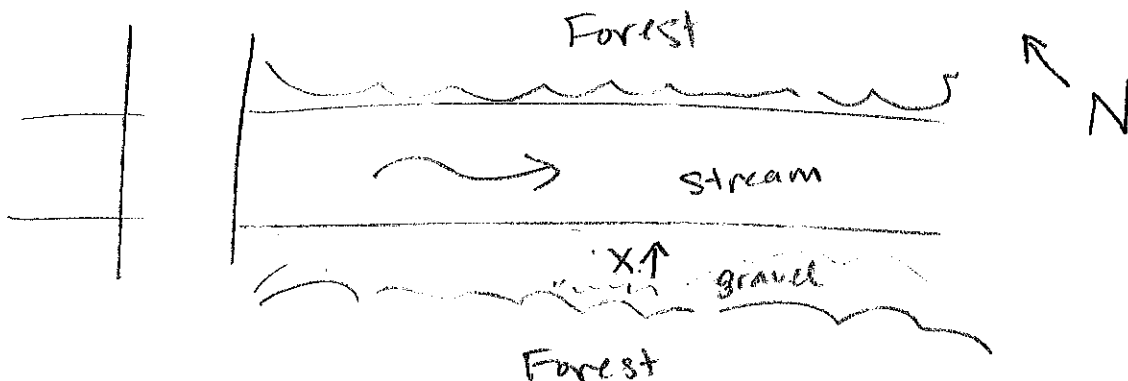
Survey Date: 7/10/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Floodplain

Description of Habitat:

on gravel bar on bank of stream, Forest on edge

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METER SM4 BAT FS.

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 12 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 24 State: MO County: Montgomery
Site Address: EB I-495, approx. 0.45 mi W of interchange with New Hampshire Ave.
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0195291 N, 76.9833197 W
Site Photo Number: 1778 - 1779
Person(s) Who Selected Acoustic Site: RCL/EXG
Person(s) who Deployed Detector: JS/SLY

Night 1 -

Unit #1

Survey Date: 7/9/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 7/10/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

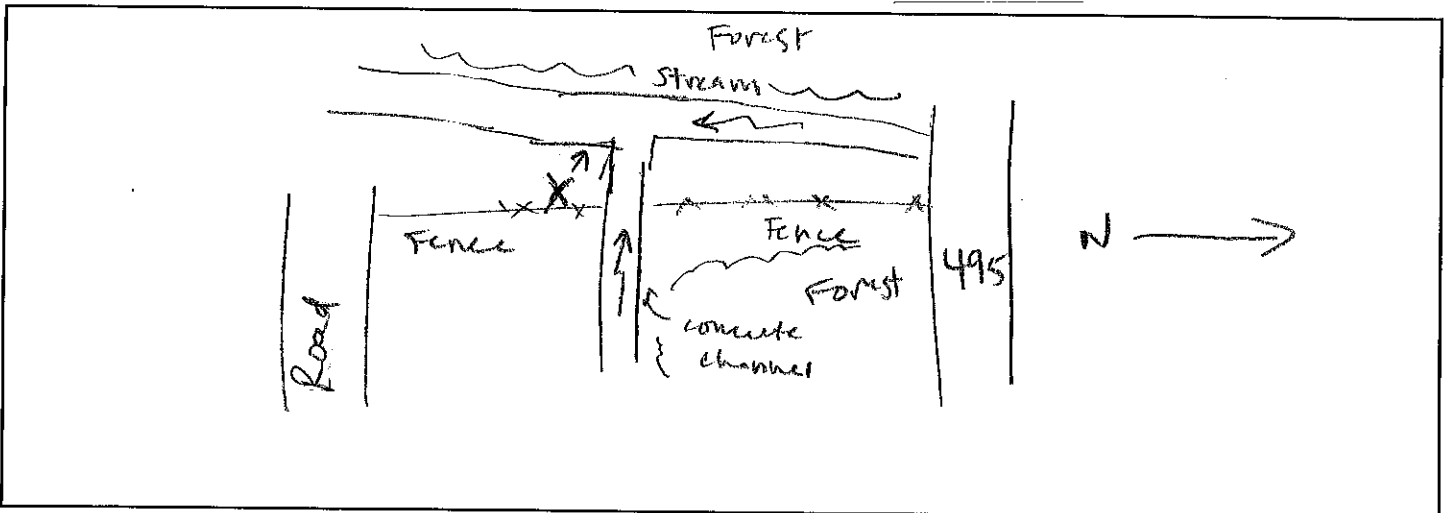
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Edge of concrete channel

Description of Habitat:

Disturbed Forest edge near where concrete channel meets stream

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METER SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: OMNIDIRECTIONAL

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~15 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 24A State: MD County: Prince Georges
Site Address: WB 1-495, approx. 0.19 W of junction with Riggs Rd.
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0189057 N, 76.9669088 W
Site Photo Number: 6752
Person(s) Who Selected Acoustic Site: EY G/RCL
Person(s) who Deployed Detector: EY G/RCL

Night 1 -

Survey Date: 6/22/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms Last night

Night 2 -

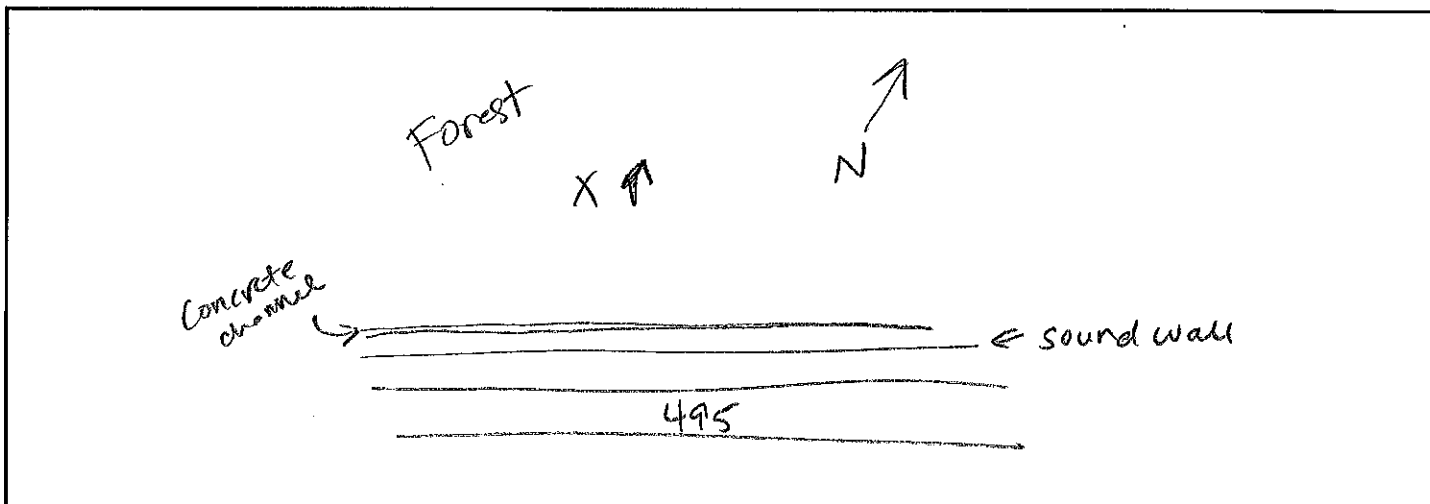
Survey Date: 6/23/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): upland forest

Description of Habitat:

Chestnut/white oak forest. Few shrubs in understory - low herbaceous cover.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~4.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 24B State: MD County: Prince Georges
Site Address: median of I-495, approx 0.35 mi E of Riggs Road
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0195019 N, 76.9593368 W
Site Photo Number: 6753
Person(s) Who Selected Acoustic Site: EYG/RCL
Person(s) who Deployed Detector: EYG/RCL

Night 1 -

Survey Date: 06/22/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms overnight * had sunny + B
file on card - left alone

Night 2 -

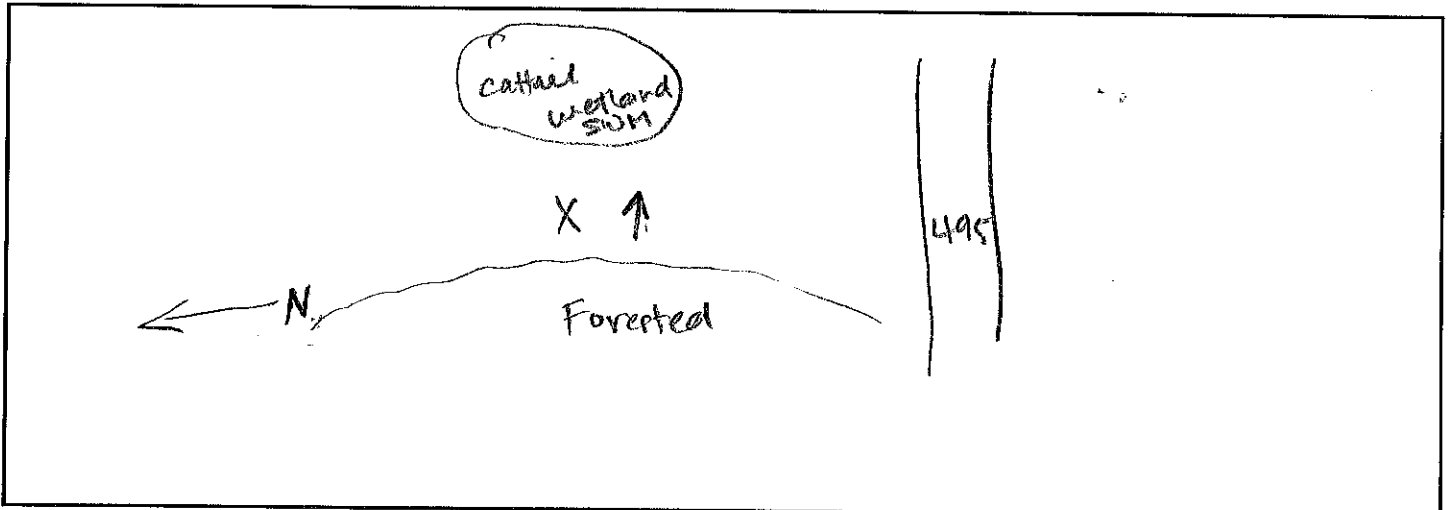
Survey Date: 06/23/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): SWN wetland

Description of Habitat:

overlooking cattail SWN feature. Forested edge.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONGmeter SM4 BAT #8
 Microphone Brand & Model: SMM-V2
 Microphone Type: omnidirectional
 Type of Weatherproofing: N/A
 Microphone Height Above Ground-level Vegetation: 3 meters
 Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~60 meters
 Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °
 Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 25 State: MD County: Prince Georges
 Site Address: Approx. 300 ft NW of interchange of I-495 and SR 1-95, NW quad.
 Site Owner: MDOT SHA
 Site Lat./Long. Coordinates: 39.0242579 N, 76.9503155 W
 Site Photo Number: 6755
 Person(s) Who Selected Acoustic Site: EYG/RCL
 Person(s) who Deployed Detector: EYG/RCL

Night 1 -

Survey Date: 6/22/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms Overnight

Night 2 -

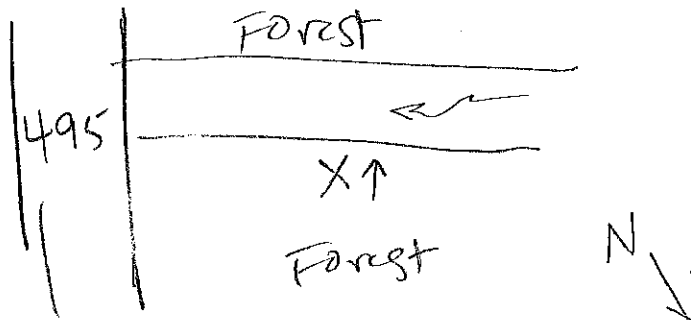
Survey Date: 6/23/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Forest edge looking over stream. Red maple + tulip poplar
 overstory. Invasives in understory. (PAINE BRANCH)

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METER SM4 BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5MS/NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 S
Max Length	00m : 15 S
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 26 State: MD County: Prince Georges
 Site Address: Interchange of WB 1-495 & SB 1-495, 0.07 mi N of ramp split to
 Site Owner: MDOT SHA Pinck and Ride.
 Site Lat./Long. Coordinates: 39.0266987 N, 76.9510646 W
 Site Photo Number: 6748
 Person(s) Who Selected Acoustic Site: EYG/RCU
 Person(s) who Deployed Detector: EYG/RCU

Night 1 -

Survey Date: 06/22/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Rain on night Steady Rain Thunderstorms Clear after storms last night

Night 2 -

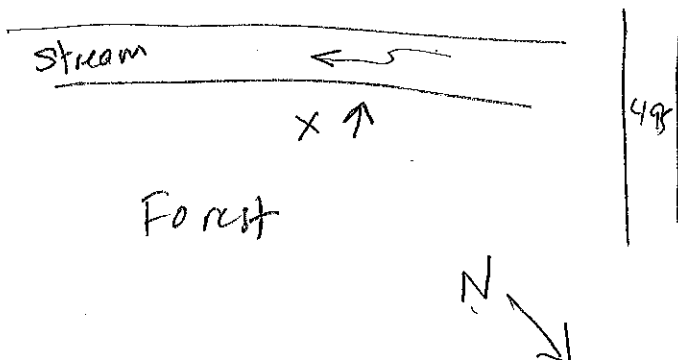
Survey Date: 06/23/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Red maple + oak forest along stream - invasives in
understory. Paint Branch stream valley.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METEK SM4 BAT FS

Microphone Brand & Model: SM-M-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~1.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00m:15s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 27 State: MD County: Prince Georges.
Site Address: SE quad. of interchange of NB I-495 & I-95, 0.11 mi. SW of Exit
Site Owner: MDOT SHA 25 B-A
Site Lat./Long. Coordinates: 39.0199257 N, 76.9482687 W
Site Photo Number: 6754
Person(s) Who Selected Acoustic Site: EYG/RCL
Person(s) who Deployed Detector: EYG/RCL

Night 1 -

Survey Date: 4/22/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms thunderstorms last night

Night 2 -

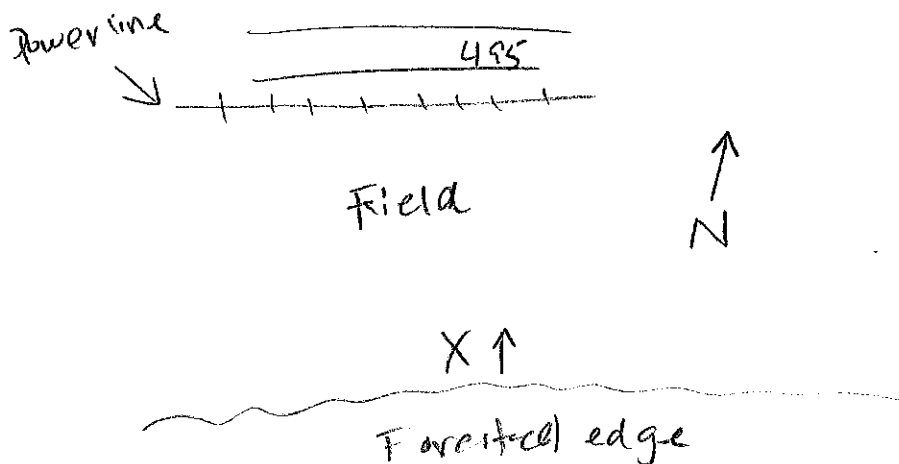
Survey Date: 06/23/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): open meadow / utility row

Description of Habitat:

Open meadow / utility row w/ grass + herbaceous species
forested edge.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: song meter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 60 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 29 State: MD County: PRINCE GEORGES
Site Address: SB I-495, approx. 0.5 mi W of interchange with Baltimore Ave
Site Owner: MNCPCL
Site Lat./Long. Coordinates: 39.0193280 N, 76.9335090 W
Site Photo Number: 2767-2768 (7/14/20)
Person(s) Who Selected Acoustic Site: RCL/EY/G
Person(s) who Deployed Detector: EY/G, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

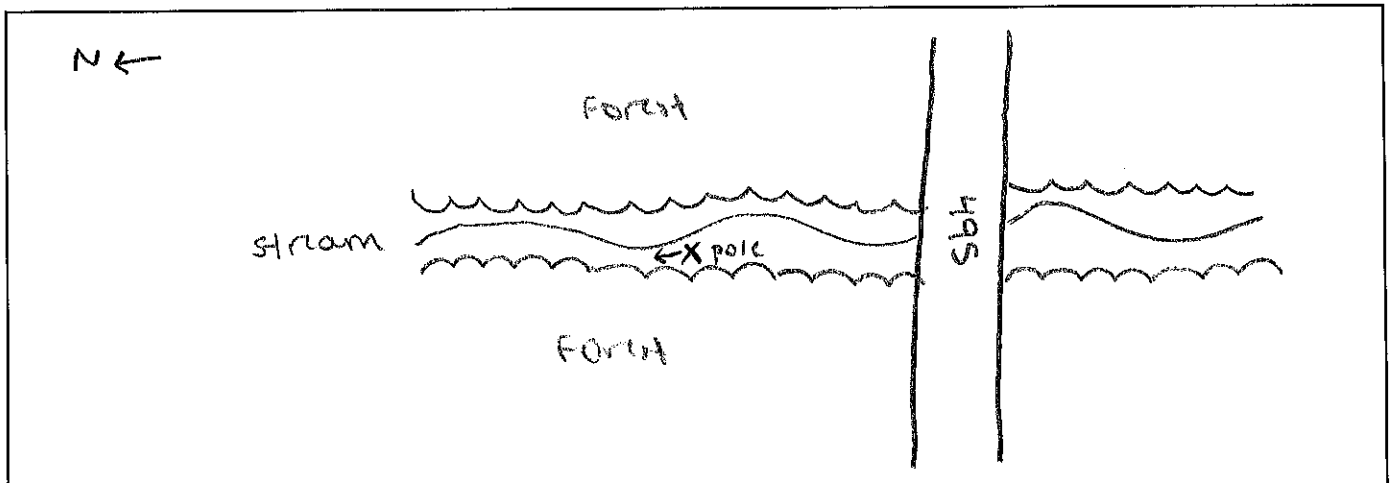
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Forested stream that flows under 495 bridge

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 30 State: MD County: Prince Georges
Site Address: NB I-495, approx. 0.23 mi NW of interchange with Cherrywood Ln.
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0117980 N, 76.9031779 W
Site Photo Number: 2758 (7/14/20)
Person(s) Who Selected Acoustic Site: EYG, RCL
Person(s) who Deployed Detector: EYG, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain
Steady Rain; Thunderstorms

Night 2 -

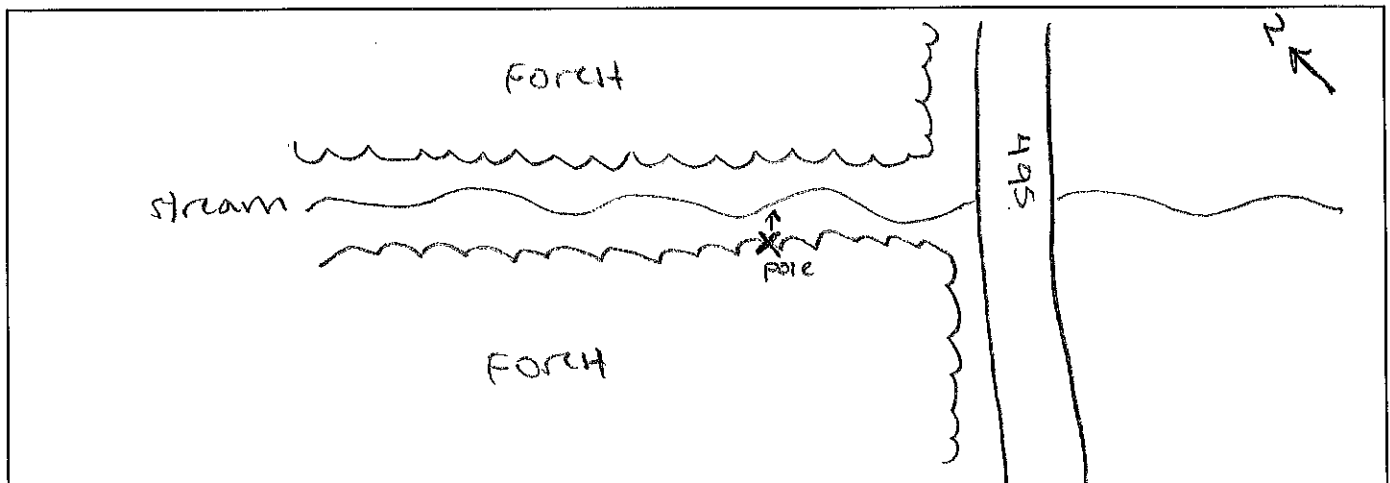
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

forested stream along 495 overpass over channel

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeters SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: OMNIDIRECTIONAL

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 31A State: MD County: Prince Georges
Site Address: NB I-495, approx. 0.15 mi. SE of junction with 95 and Kenilworth Ave.
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0021504 N, 76.8931140 W
Site Photo Number: 2756-2757 (7/14/20)
Person(s) Who Selected Acoustic Site: RCL/EYG
Person(s) who Deployed Detector: EYG, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain
Steady Rain; Thunderstorms

Night 2 -

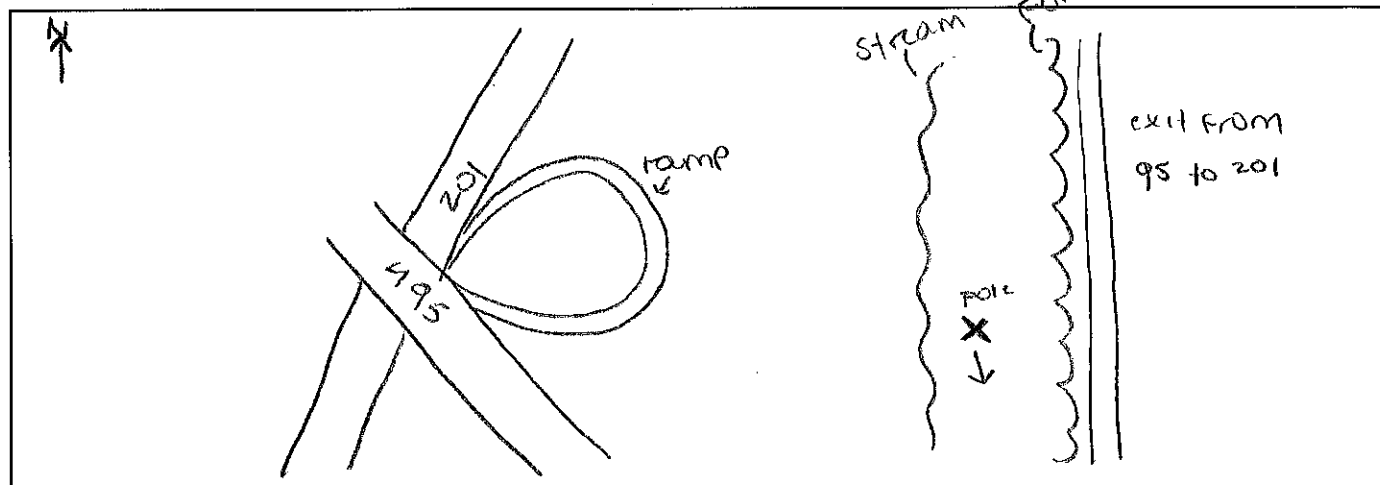
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested stream

Description of Habitat:

Forest along stream parallel to roadway embankment (ramp)

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Song Meter SM4 BAT FS
 Microphone Brand & Model: SMM-U2
 Microphone Type: omnidirectional
 Type of Weatherproofing: N/A
 Microphone Height Above Ground-level Vegetation: 3 meters
 Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 3 meters
 Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °
 Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00m:15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 32 State: MD County: PRINCE GEORGES
 Site Address: Southbound I-295, 0.17 miles east of ramp to Southway
 Site Owner: MDOT SHA
 Site Lat./Long. Coordinates: 38.9969177 N, 76.8753528 W
 Site Photo Number: 6751
 Person(s) Who Selected Acoustic Site: EYG/RCL
 Person(s) who Deployed Detector: EYG/RCL

Night 1 -

Survey Date: 06/22/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms overnight

Night 2 -

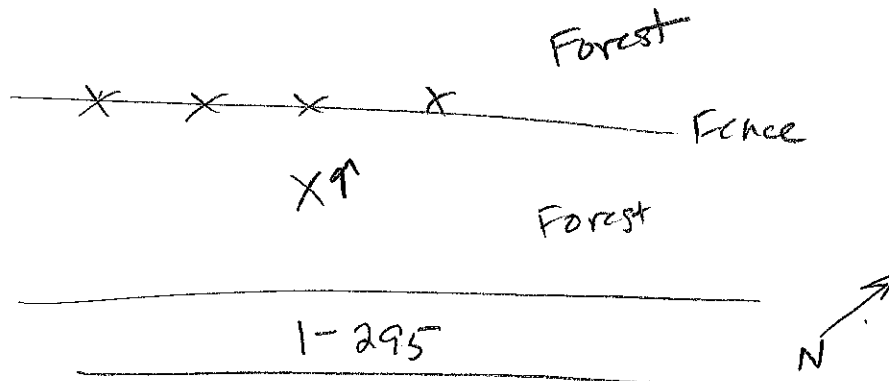
Survey Date: 06/23/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested

Description of Habitat:

Sweet gum/red maple forest

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM4BAT FS

Microphone Brand & Model: SM11-U2

Microphone Type: Omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 33 State: MD County: Prince George's
Site Address: Approx. 170ft S of southern quad of intersection of I-495 and I-295
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 38.9893683 N, 76.8863156 W
Site Photo Number: 6750
Person(s) Who Selected Acoustic Site: EYG/RCL
Person(s) who Deployed Detector: EYG/RCL

Night 1 -

Survey Date: 6/22/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:43

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms overnight * extra SMS file on card - left it alone

Night 2 -

Survey Date: 6/23/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:43

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

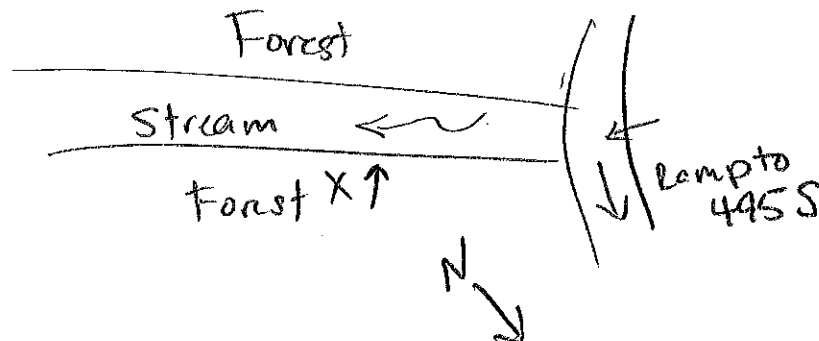
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Red maple forest on both sides of stream

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 0.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12db
Trigger Window	3s
Max Length	00m : 15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 34A State: MD County: Prince Georges
 Site Address: SB 1-295, approx. 1 mi S of interchange with 1-495.
 Site Owner: MDOT SHA
 Site Lat./Long. Coordinates: 38.9825871 N, 76.8939339 W
 Site Photo Number: 6749
 Person(s) Who Selected Acoustic Site: EYG/RCL
 Person(s) who Deployed Detector: EYG/RCL

Night 1 -

Survey Date: 06/22/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms overnight

Night 2 -

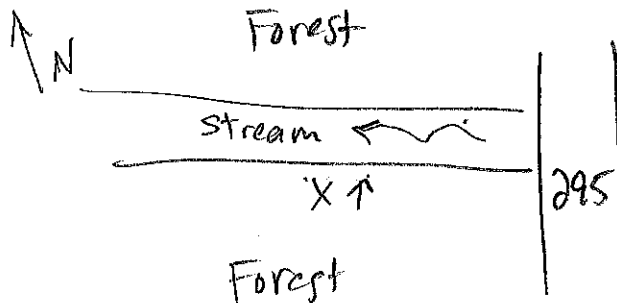
Survey Date: 06/23/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:43
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Red maple forest along stream, microstegium in understory

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONIC METER SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 1 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 34B State: MD County: PRINCE GEORGES
Site Address: 730 ft southeast of the intersection of MD450 and 85th ave
Site Owner: MDDP SHA
Site Lat./Long. Coordinates: 38.9580307 N, 76.8670943 W
Site Photo Number: 6765^v
Person(s) Who Selected Acoustic Site: EVG, RCL
Person(s) who Deployed Detector: EVG, NLB

Night 1 -

Survey Date: 06/24/2020
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

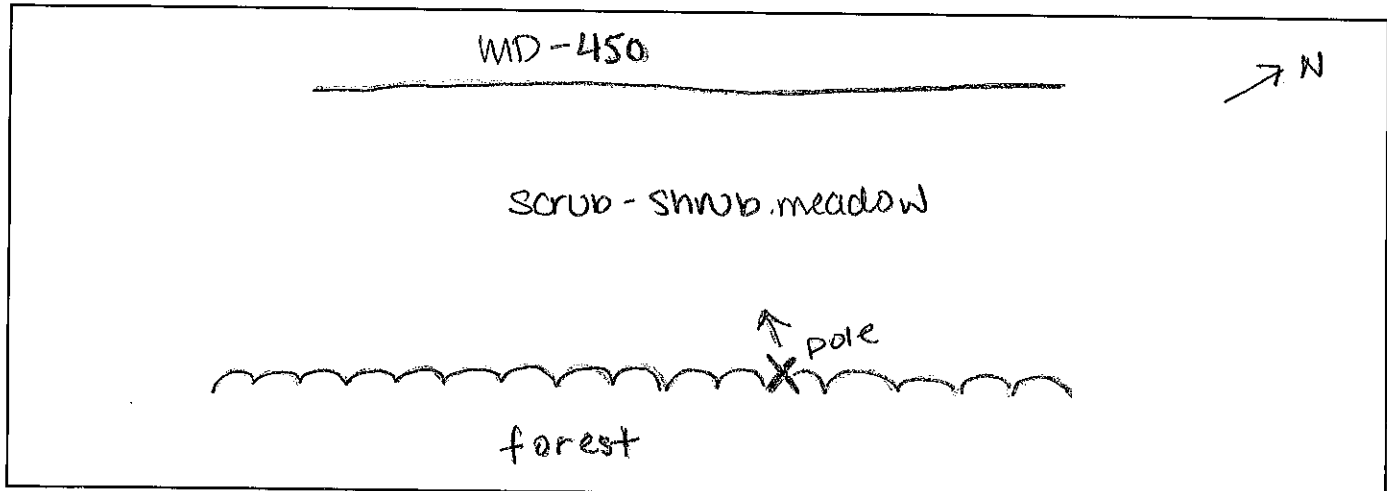
Survey Date: 06/25/2020
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): scrub-shrub meadow

Description of Habitat:

scrub-shrub meadow bordered by red maple forest adjacent to MD-450 (Annapolis Road). scrub-shrub vegetation consists of Bradford Pear and sweetgum (mostly ≤ 20 ft high).

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM4-BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 10 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 34C State: MD County: PRINCE GEORGES
Site Address: NB GARDEN CITY DR and approx. 0.17 mi S of Timber Ln
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 38.9507169 N, 76.8599584 W
Site Photo Number: 6764
Person(s) Who Selected Acoustic Site: ENR, RCL
Person(s) who Deployed Detector: EYG, NLE

Night 1 -

Survey Date: 06/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

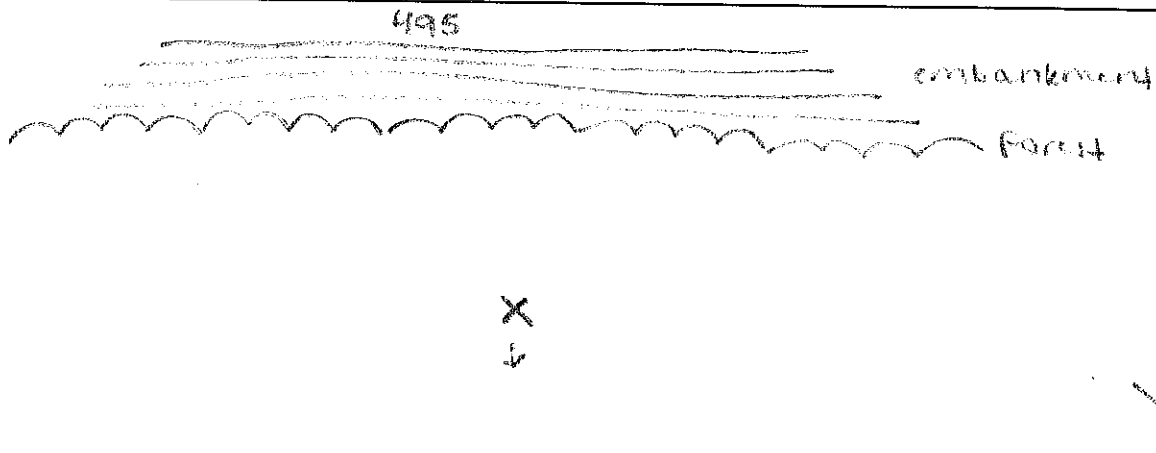
Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested

Description of Habitat:

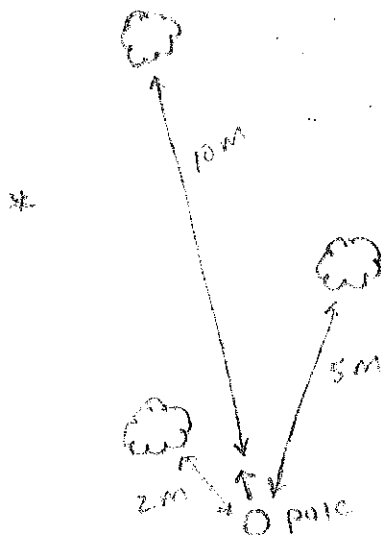
sweetgum/red maple forest along 495 at toe of roadway
embankment

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeter SM4BAT FS
 Microphone Brand & Model: SMM-V2
 Microphone Type: omnidirectional
 Type of Weatherproofing: N/A
 Microphone Height Above Ground-level Vegetation: 3 meters
 Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 2.25 meters
 Horizontal Orientation of Microphone: ° Vertical Orientation of Microphone: °
 Calls Collected In (circle one): Full Spectrum; Zero Crossing
 Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE



I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 34D State: MD County: PRINCE GEORGES
Site Address: INTERCHANGE OF EB MUKDY HWY & WB US-50, APPROX. 180 ft N of WB US-50
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 38.9472771 N, 76.8412758 W
Site Photo Number: 6763
Person(s) Who Selected Acoustic Site: ENG, RCL
Person(s) who Deployed Detector: ENG, NRB

Night 1 -

Survey Date: 06/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

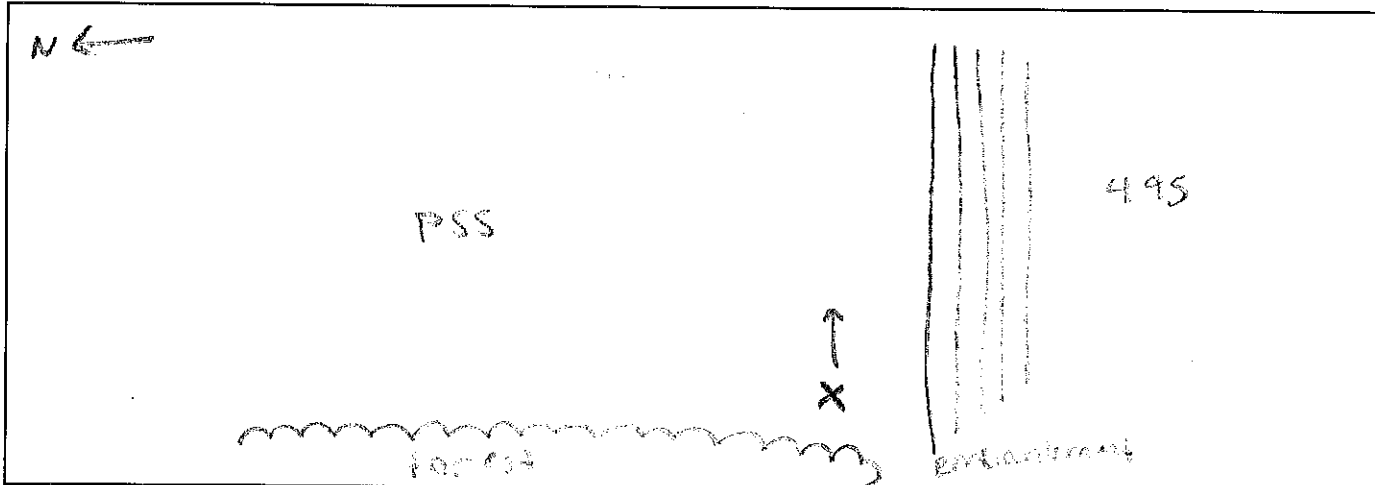
Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): scrub-shrub wetland (PSS)

Description of Habitat:

swampy/groundwater wetland adjacent to 495 roadway
embankment

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 150 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 34E State: MD County: PRINCE GEORGES
Site Address: APPROX. 0.7 MI N OF INTERCHANGE WITH LANDOVER RD, NB I-495.
Site Owner: MDOT SHA ROW
Site Lat./Long. Coordinates: 38.9250450 N, 76.8542824 W
Site Photo Number: 6759-6760
Person(s) Who Selected Acoustic Site: EVA, RCL
Person(s) who Deployed Detector: EVA, NLB

Night 1 -

Survey Date: 06/24/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:43

General Weather (circle one) Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 06/25/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:43

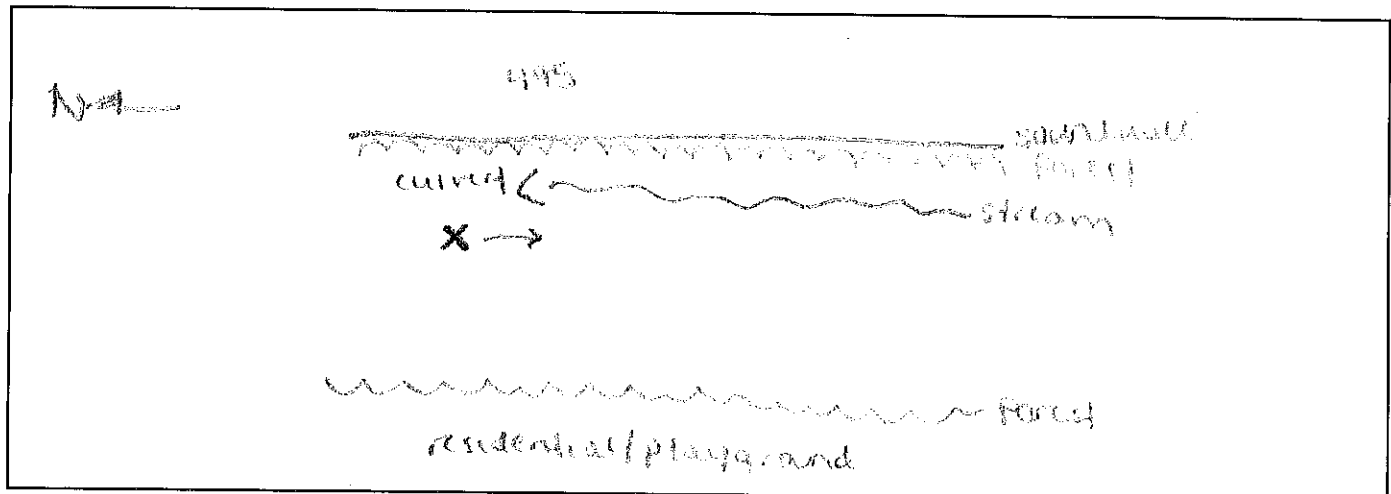
General Weather (circle one) Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Oak/sweetgum forest abutting 495 sandbar, bisected by channel
not parallel 495

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeter SM4BATES

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters *5m (15ft) above ground*

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

Sound wave
20m
25m

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 35 State: MD County: Prince Georges
Site Address: approx. 220-ft E of I-495, 0.3 mi S of interchange w/ Central Ave
Site Owner: MNCPPE
Site Lat./Long. Coordinates: 38.8891460 N, 76.8451591 W
Site Photo Number: 2703-2709 (7/14/20)
Person(s) Who Selected Acoustic Site: RCL/EVG
Person(s) who Deployed Detector: EVG, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

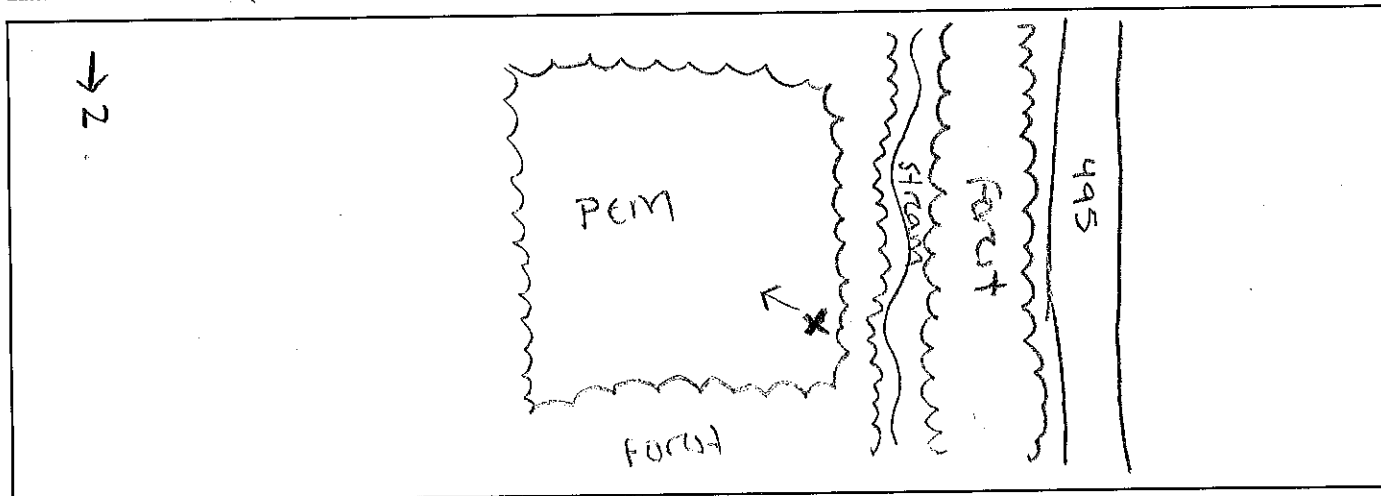
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream; floodplain): PEM

Description of Habitat:

PEM bordered by forest along 495 with adjacent stream

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Song meter SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 30 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 35A State: MD County: Prince Georges
Site Address: APPROX. 330 ft E of NB I-495, 0.60 mi S of interchange with ROUTE
Site Owner: EKE PARTNERSHIP MONTGOMERY CO
Site Lat./Long. Coordinates: 38.8602511 N, 76.8486737 W
Site Photo Number: 2701-2702
Person(s) Who Selected Acoustic Site: RCL/EKE
Person(s) who Deployed Detector: EKE, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

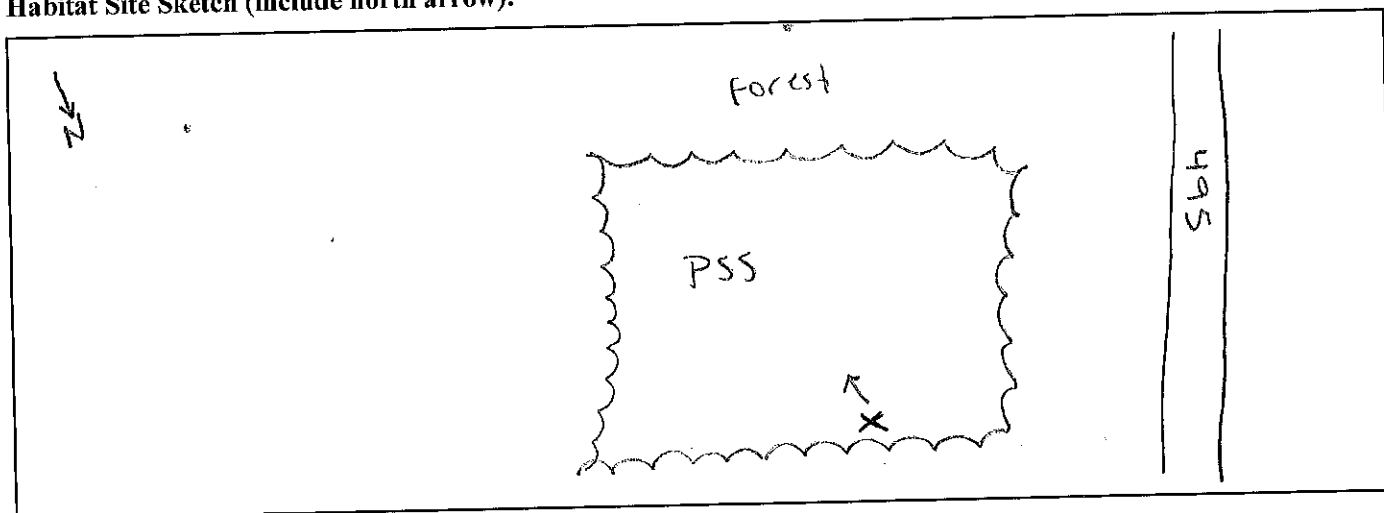
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): scrub-shrub wetland (PSS)

Description of Habitat:

PSS surrounded by forest along 495

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 10 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 35B State: MD County: PRINCE GEORGES.
Site Address: APPROX. 120ft E of I-495, 1.02 mi N of interchange with
Site Owner: MDOT SHA PENNSYLVANIA AVE
Site Lat./Long. Coordinates: 38.8502778 N, 76.8605187 W
Site Photo Number: 2759-2760 (7/14/20)
Person(s) Who Selected Acoustic Site: EVN, PCL
Person(s) who Deployed Detector: EYG, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

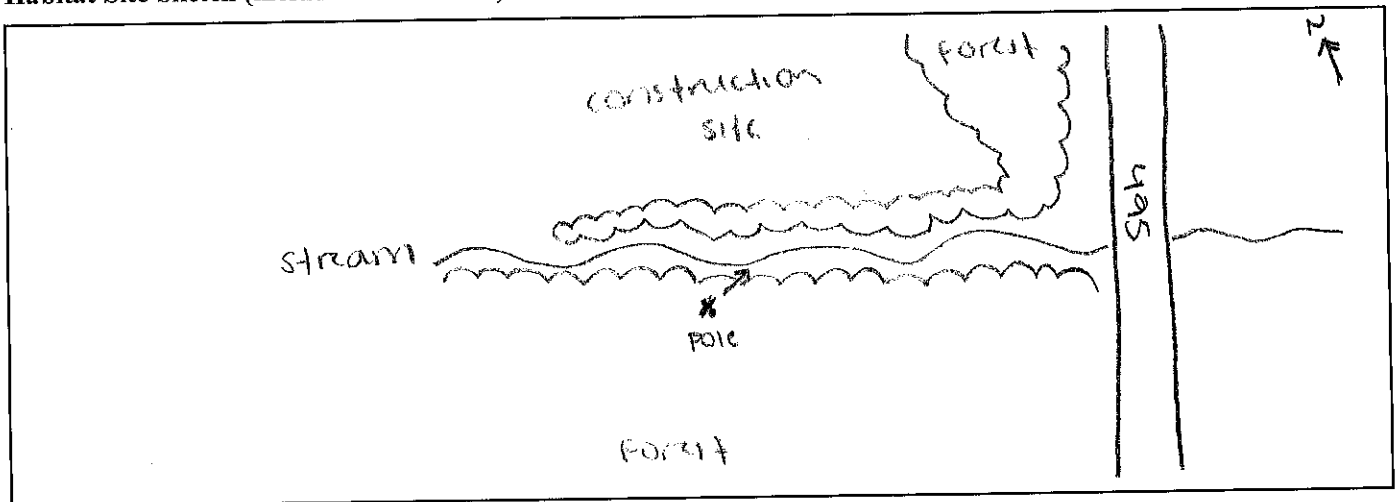
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Forested stream with adjacent construction site, stream runs under 495

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 8 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 36 State: MD County: Prince Georges
 Site Address: Approx. 133 ft N of WB Suttland Pkwy and 250 ft NE of Junction
 Site Owner: MDOT SHA WHN 1-495
 Site Lat./Long. Coordinates: 38.8308160 N, 76.8728547 W
 Site Photo Number: 08
 Person(s) Who Selected Acoustic Site: RCL/EVH
 Person(s) who Deployed Detector: EVH/SLY

Night 1 -

Survey Date: 06/29/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

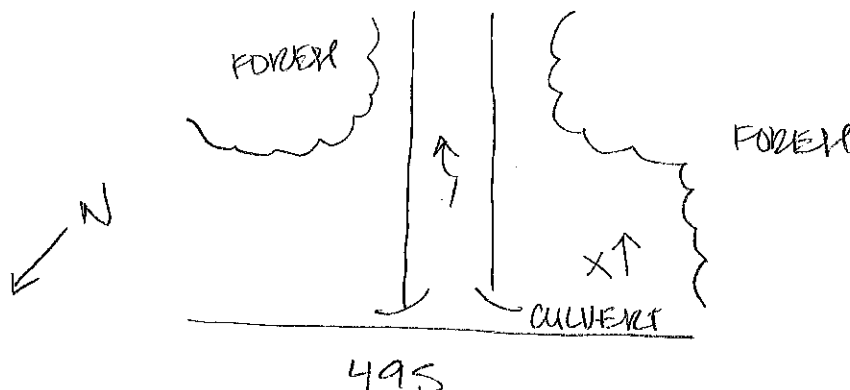
Survey Date: 06/30/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): OPEN WETLAND ADJACENT TO FOREST

Description of Habitat:

EDGE OF OPEN WETLAND NEAR CULVERT UNDER 495. VIRGINIA
 PINE, SWEETGUM, WILLOW OAK FOREST ON EDGE.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METER SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~1.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 36A State: MD County: PRINCE GEORGES
 Site Address: APPROX 170 ft NW of SB 1-495 and 0.22 mi NE of junction of FORESTVILLE Rd.
 Site Owner: PRINCE GEORGE'S COUNTY
 Site Lat./Long. Coordinates: 38.8292151 N, 76.8764998 W
 Site Photo Number: 06
 Person(s) Who Selected Acoustic Site: RCL/EVH
 Person(s) who Deployed Detector: EVH/SLV

Night 1 -

Survey Date: 06/29/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

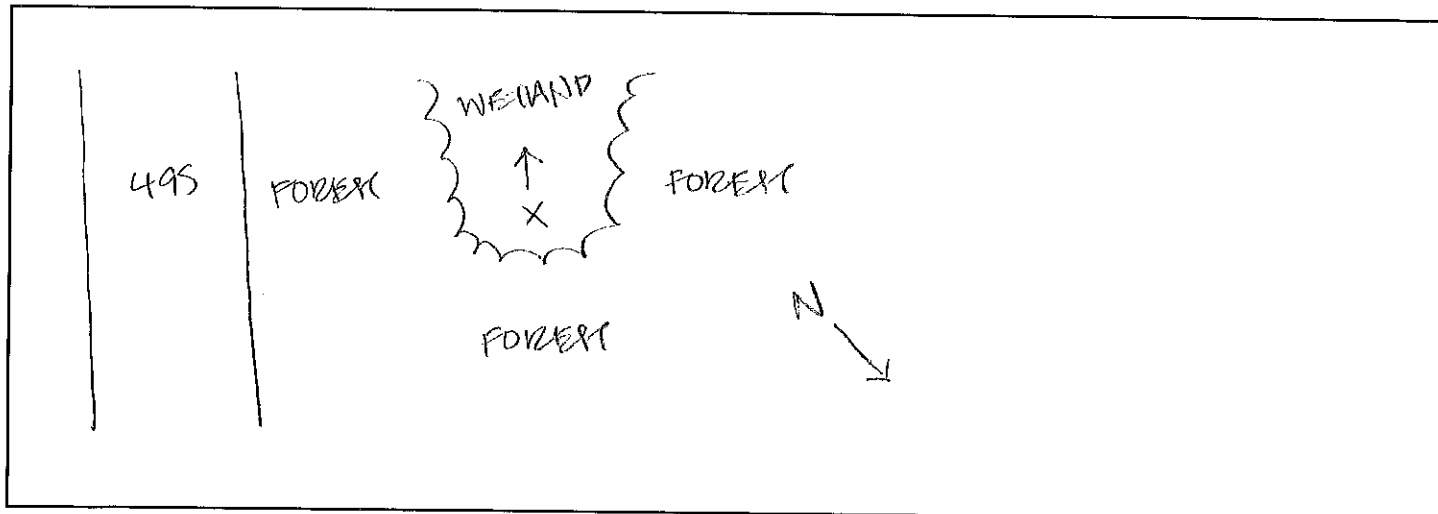
Survey Date: 06/30/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): OPEN WETLAND CORRIDOR

Description of Habitat:

PAUSCULINE EMERGENT WETLAND WITH FOREX ON EACH SIDE.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00m:15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 36B State: MD County: Prince Georges
 Site Address: Approx. 130 ft N of SB 1-495 and 0.26 mi N of junction with Sutherland Rd
 Site Owner: MDOT SHA
 Site Lat./Long. Coordinates: 38.8237684 N, 76.8846077 W
 Site Photo Number: 04-05
 Person(s) Who Selected Acoustic Site: RCL/ENH
 Person(s) who Deployed Detector: ENH/SLY

Night 1 -

Survey Date: 06/29/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

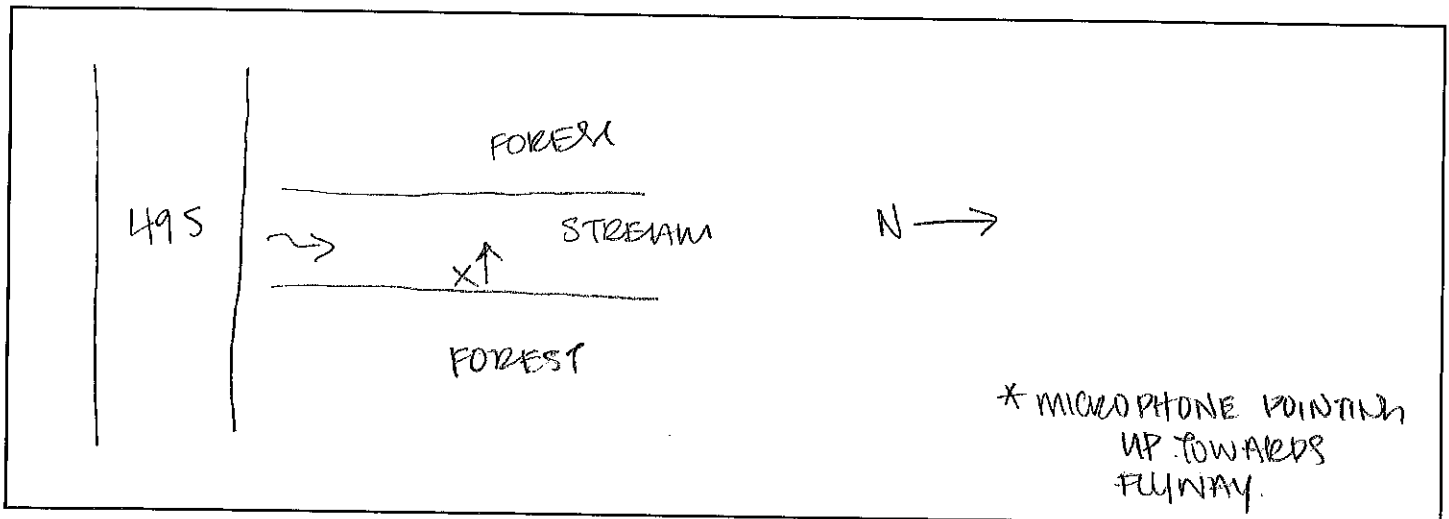
Survey Date: 06/30/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): STREAM GRAVEL BAR

Description of Habitat:

SWEET BAY / SWEET GUM FPD - HIGH QUALITY WETLAND IN UNDERSTORY

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~1.5 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~0.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00m:15s
Compression	NONE.

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 36C State: MD County: Prince Georges
 Site Address: Approx. 0.12 mi E of Walton Ave CW-CR-SAL
 Site Owner: BRUSO FAYE
 Site Lat./Long. Coordinates: 38.8198034 N, 76.8957216 W
 Site Photo Number: 03
 Person(s) Who Selected Acoustic Site: EYG/RCL
 Person(s) who Deployed Detector: EYG/SLY #2

Night 1 -

Survey Date: 6/29/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

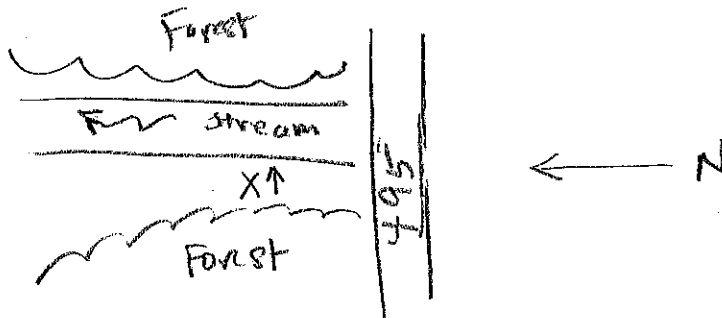
Survey Date: 6/30/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Edge of stream

Description of Habitat:

Edge of slow-flowing stream. Forested edge of red maple

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SUNG METER SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~1 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3s
Max Length	00m:15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 36D State: MD County: Prince Georges.

Site Address: Approx. 145 E of ramp from NB I-495 to Auth Road.

Site Owner: MDOT SHA

Site Lat./Long. Coordinates: 38.8198695 N, 76.9160706 W

Site Photo Number: 02

Person(s) Who Selected Acoustic Site: EYE/RCL

Person(s) who Deployed Detector: EYE/SLY

#10

Night 1 -

Survey Date: 6/29/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:45

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 6/30/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:45

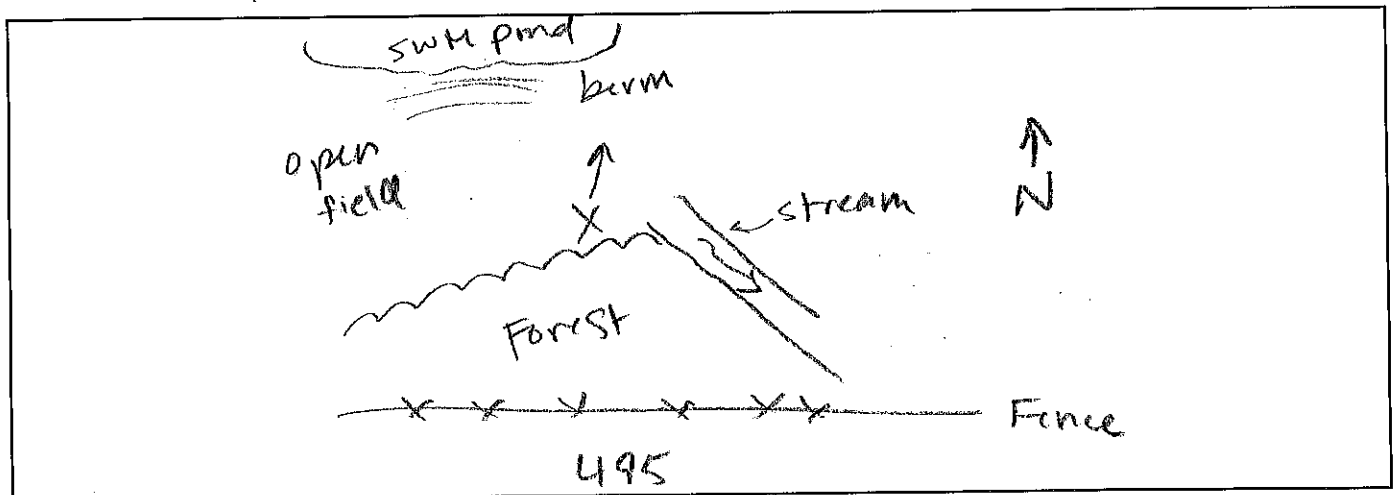
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forest edge

Description of Habitat:

Edge of forest near both SWM pond + stream

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM 4 BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: OMNIDIRECTIONAL

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3s
Max Length	00m:15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 38 State: MD County: Prince Georges
 Site Address: Henson Stream Valley Park, approx 218 ft S of NB 1-495, 0.12 mi W of
 Site Owner: MNCPPE Kleppey Pl Cul-de-sac
 Site Lat./Long. Coordinates: 38.8180222 N, 76.9312426 W #9 did not say "refreshing cards" but did have recorded data
 Site Photo Number: 01 - EYG phone
 Person(s) Who Selected Acoustic Site: EYG/RCU
 Person(s) who Deployed Detector: EYG/SLY

Night 1 -

Survey Date: 6/29/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

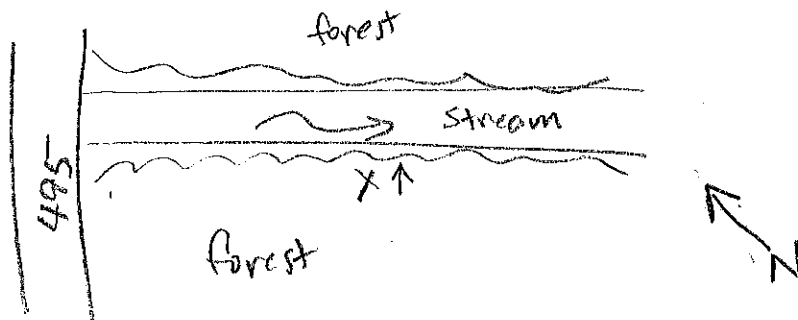
Survey Date: 6/30/20
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested stream

Description of Habitat:

Red maple/Sweetgum forest along stream

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM 4 BATT FS

Microphone Brand & Model: SMM - 02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 0.5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00m : 15s
Compression	NONE.

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: 39-Bridge to Reenwicks Rd State: MD County: MontgomerySite Address: located past bridge to Reenwicks roadSite Owner: MDOT SHASite Lat./Long. Coordinates: 38.9837666 N, -77.1605604 WSite Photo Number: 0093 - 0095Person(s) Who Selected Acoustic Site: RCL KENIGPerson(s) who Deployed Detector: RCL KENIG

Night 1 -

Survey Date: 06/17/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

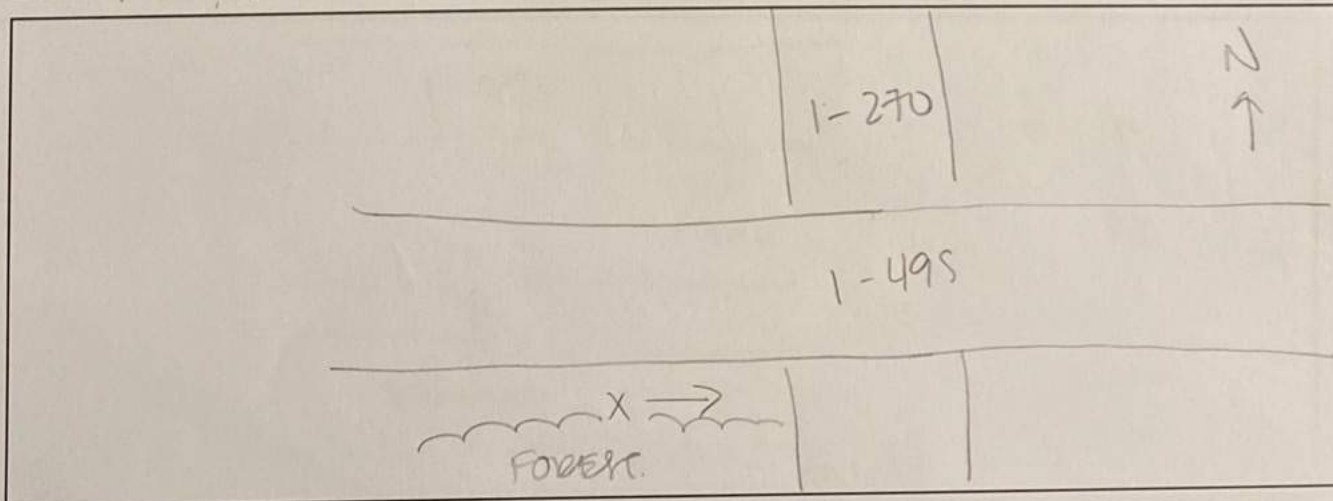
Night 2 -

Survey Date: 06/18/20Survey Start Time (military): 19:36 Survey End Time (military): 06:45General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; ThunderstormsHabitat Type (e.g. forested stream, floodplain): FOREST

Description of Habitat:

Device located on slope of forest located past Reenwicks road
Bridge to.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METEK SM4BAT
Microphone Brand & Model: SMM-02
Microphone Type: omnidirectional
Type of Weatherproofing: N/A
Microphone Height Above Ground-level Vegetation: 1.5 meters
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): <1 meters
Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °
Calls Collected In (circle one): Full Spectrum; Zero Crossing
Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 M: 15 S
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: 40 State: MD County: Montgomery
Site Address: Westbound Clara Barton Parkway Exit Ramp to I-495
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.9751152 N, -77.1775419 W ← from Google
Site Photo Number: 2138
Person(s) Who Selected Acoustic Site: EVA/KCL
Person(s) who Deployed Detector: EVA/JS

Night 1 -

Survey Date: 7/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

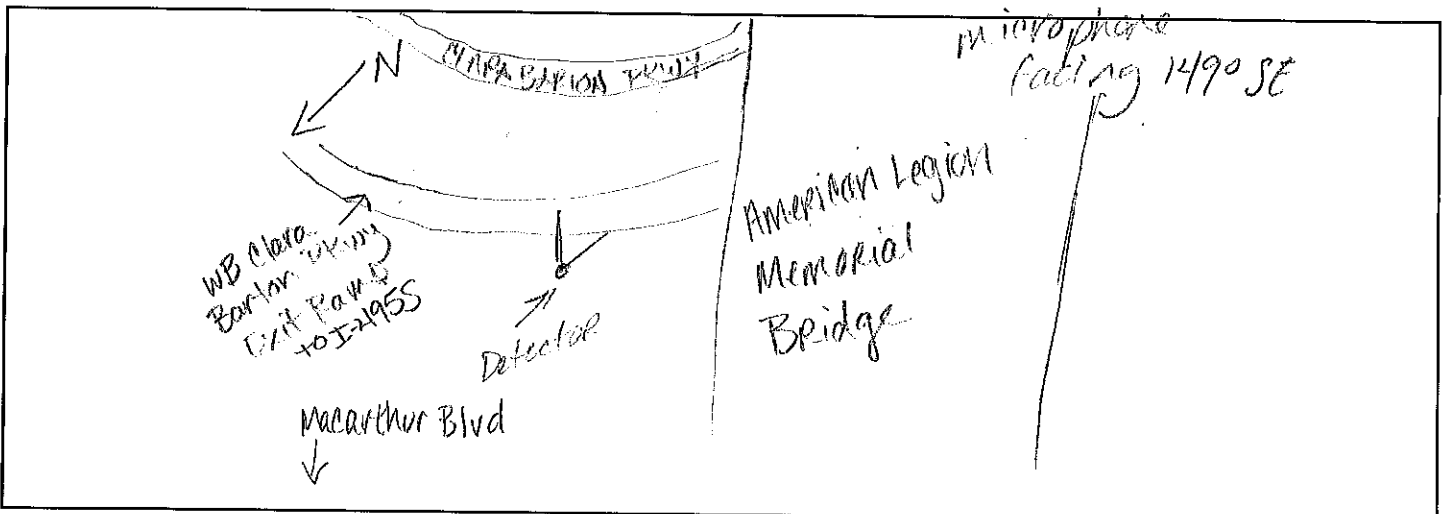
Survey Date: 7/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested

Description of Habitat:

forested median next to Clara Barton Pkwy/McArthur Blvd bridge

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~ 15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X1 State: MD County: Montgomery
Site Address: 7401 Persimmon Tree Ln, Bethesda, MD 20817
Site Owner: Board of Education
Site Lat./Long. Coordinates: 38.9821323 N, 77.1722735 W
Site Photo Number: 2139
Person(s) Who Selected Acoustic Site: EYG, RCL
Person(s) who Deployed Detector: EYG, JS

Night 1 -

Survey Date: 7/15/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

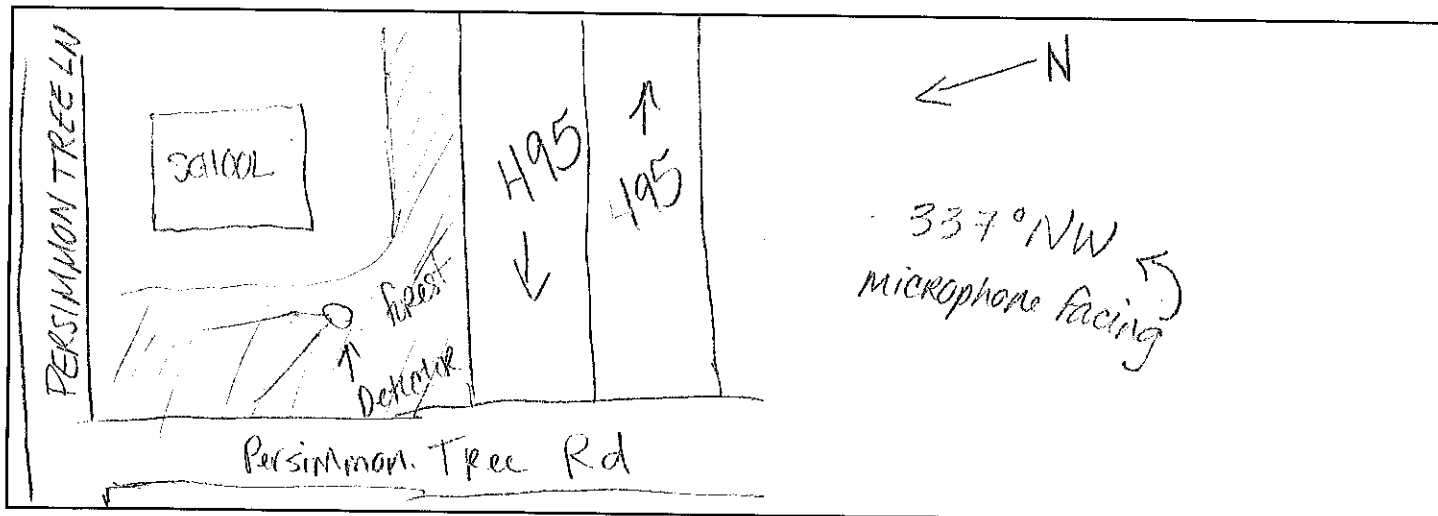
Survey Date: 7/16/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested fragment

Description of Habitat:

Forested fragment between roads. Heavily vined area.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONGmeter SMUBAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~2 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12db
Trigger Window	3s
Max Length	00m:15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: X2 State: MD County: MONTGOMERY
 Site Address: APPROXIMATELY 120 ft NW of WB 1-495, 150 ft N of Bradley Blvd
 Site Owner: MDOT SHA
 Site Lat./Long. Coordinates: 39.0097112 N, 77.1520670 W
 Site Photo Number: 07
 Person(s) Who Selected Acoustic Site: EVG, RCL
 Person(s) who Deployed Detector: EVG, JS

Night 1 -

Survey Date: 07/23/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms cleared out overnight

Night 2 -

Survey Date: 07/24/20

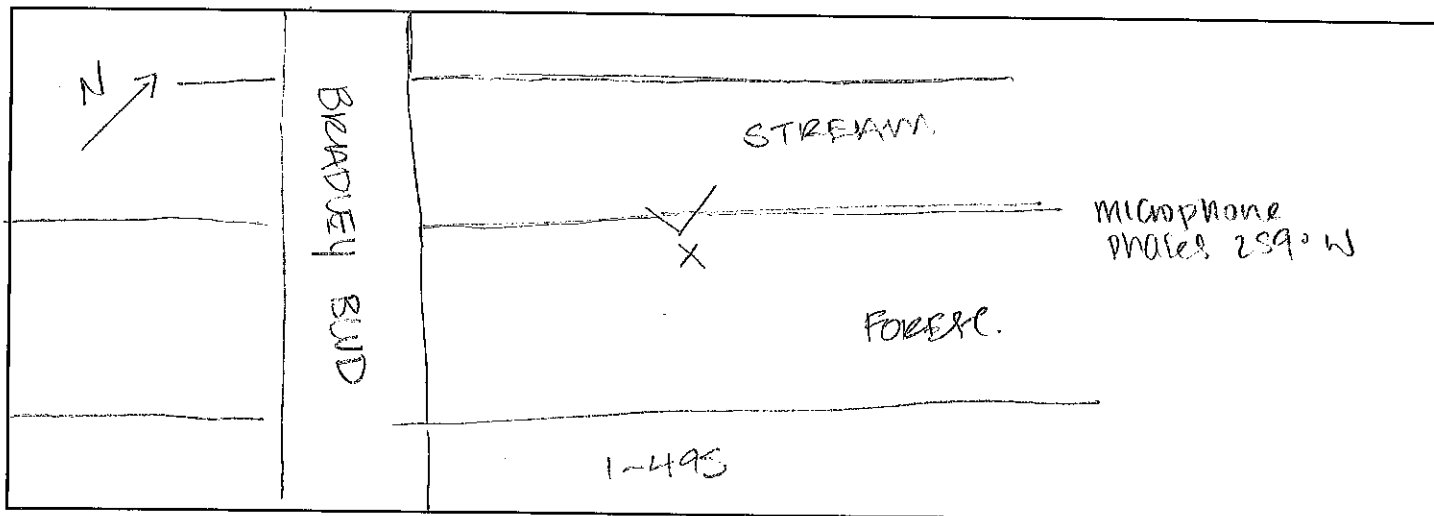
Survey Start Time (military): 19:36 Survey End Time (military): 06:51

General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested riparian area next to concrete lined stream
 Description of Habitat: stream

Forested area b/w 1-495 and concrete lined stream. A lot of invasive.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~1.5 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00m : 15s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: X3 State: MD County: MONTGOMERY
Site Address: 500 ft north of longwood dr, 170 ft south of I-495 E.
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 39.0127366 N, -77.1471336 W
Site Photo Number: 0102-0103
Person(s) Who Selected Acoustic Site: RCL EUG
Person(s) who Deployed Detector: RCL EUG

Night 1 -

Survey Date: 06/17/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

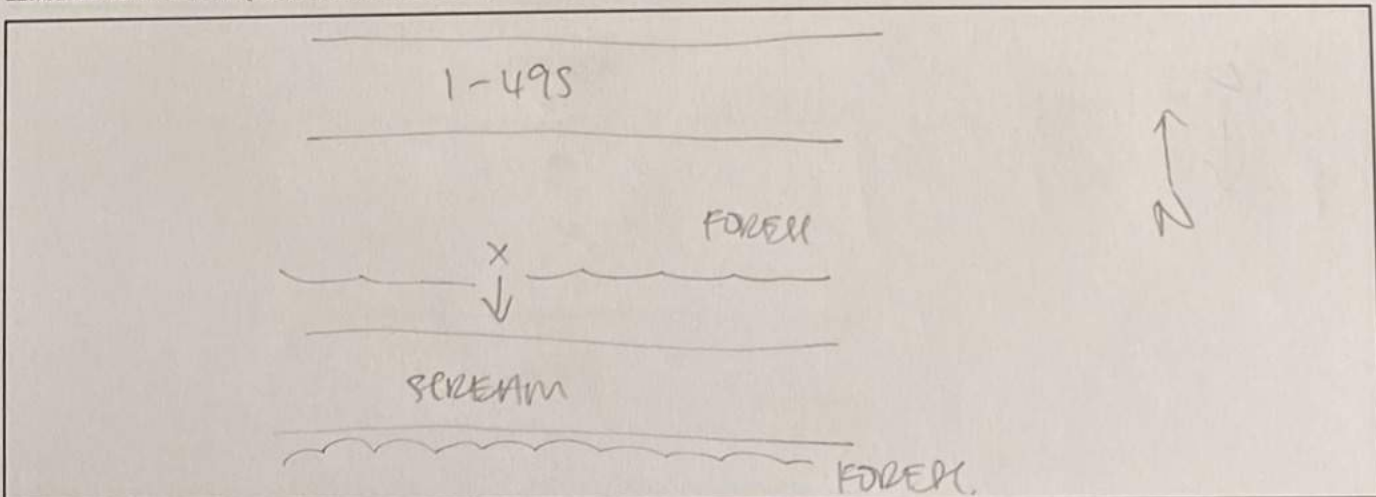
Survey Date: 06/18/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): FORESTED STREAM / FLOODPLAIN.

Description of Habitat:

FORESTED STREAM DOMINATED BY SIKAMORE. UNDERGROW
CONTAINS SENSITIVE FERN AND FALSE NETTLE

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONIX METER SM4BATMicrophone Brand & Model: SMM-V2Microphone Type: omnidirectionalType of Weatherproofing: N/AMicrophone Height Above Ground-level Vegetation: 3 metersDistance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): < 3 metersHorizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X5 State: MD County: MONTGOMERY
Site Address: APPROX. 0.1 mi S of meridian st and 150 ft W of I-495.
Site Owner: MNCPPC
Site Lat./Long. Coordinates: 39.0191599 N, 77.1084357 W
Site Photo Number: 6770
Person(s) Who Selected Acoustic Site: RCL/EYN
Person(s) who Deployed Detector: KS, EYG

Night 1 -

Survey Date: 7/6/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms ~7 PM, cleared up throughout the night.

Night 2 -

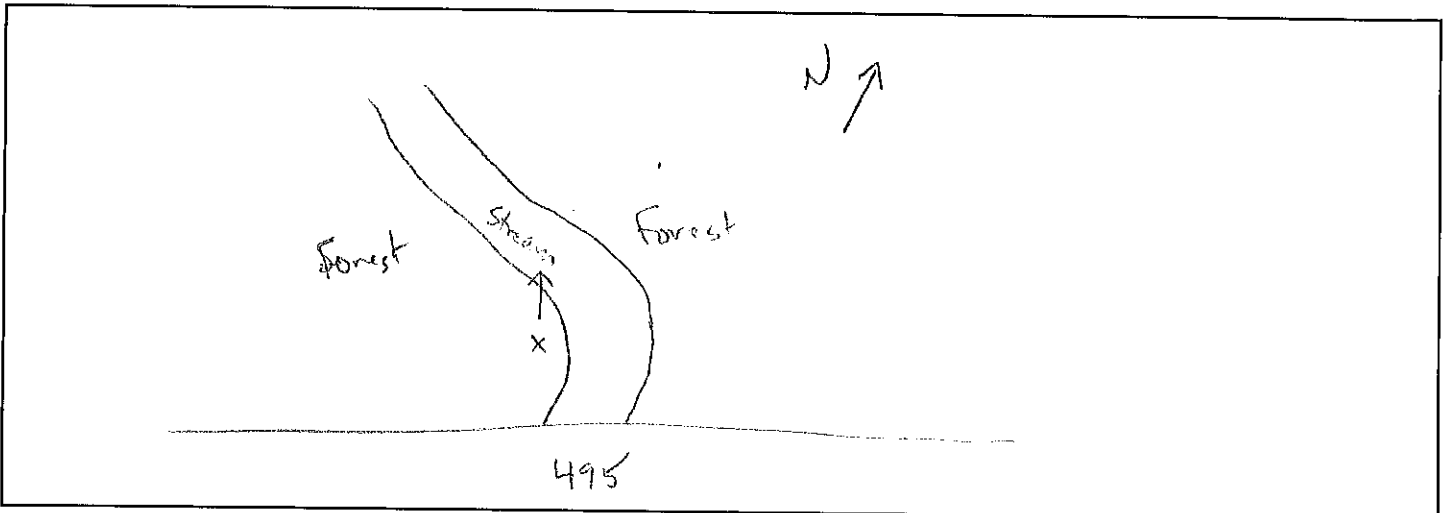
Survey Date: 7/7/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested Stream

Description of Habitat:

Forest consisting of beech, elm, red maple, and tuliptree. Sparse understory with spicebush. Very little herbaceous.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: songmeters sm4BAT FS

Microphone Brand & Model: smm-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: ~3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~20 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00m : 15 s
Compression	NONE



MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: X6 State: MD County: PRINCE GEORGES
Site Address: LOCATED 0.13 MI NE OF THE INTERSECTION OF NIAGARA PI AND EDGEMOOD
Site Owner: POUSH CLUB OF COLLEGE PARK.
Site Lat./Long. Coordinates: 39.0170009 N, 76.9131012 W
Site Photo Number: DON'T HAVE PHOTO WHEN SET UP, BUT PHOTO OF SITE WAS TAKEN.
Person(s) Who Selected Acoustic Site: RCL / EVG
Person(s) who Deployed Detector: EVG / SLV

Night 1 -

Survey Date: 06/29/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:45

General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

Survey Date: 06/30/20

Survey Start Time (military): 19:36 Survey End Time (military): 06:45

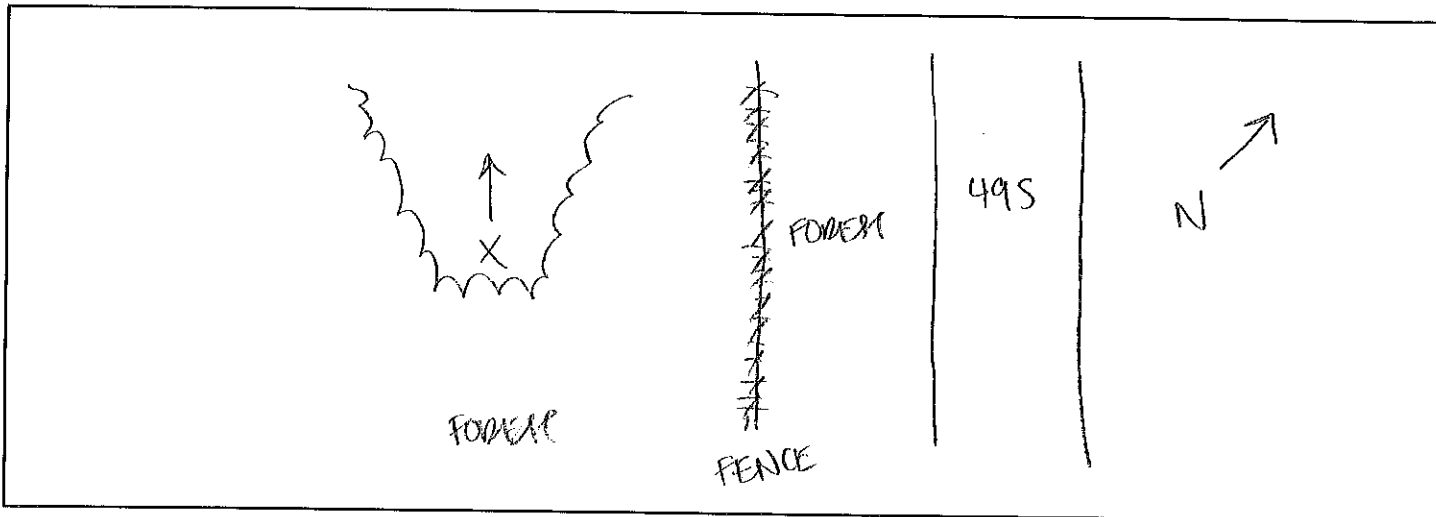
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): FOREST OPENING

Description of Habitat:

FORESTED HABITAT OPENING INTO EDGE. BEECH - OAK FOREST WITH OPEN UNDERSTORY.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONA METER SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~9 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m: 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X7 State: MD County: Prince Georges
Site Address: located within Ronca Frost Park and approx. 0.1 mi S of Woodloch Rd.
Site Owner: MNCPPC
Site Lat./Long. Coordinates: 38.9769094 N, 76.8732676 W
Site Photo Number: 0707
Person(s) Who Selected Acoustic Site: RCL/EVU
Person(s) who Deployed Detector: EYB, NLB

Night 1 -

Survey Date: 06/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

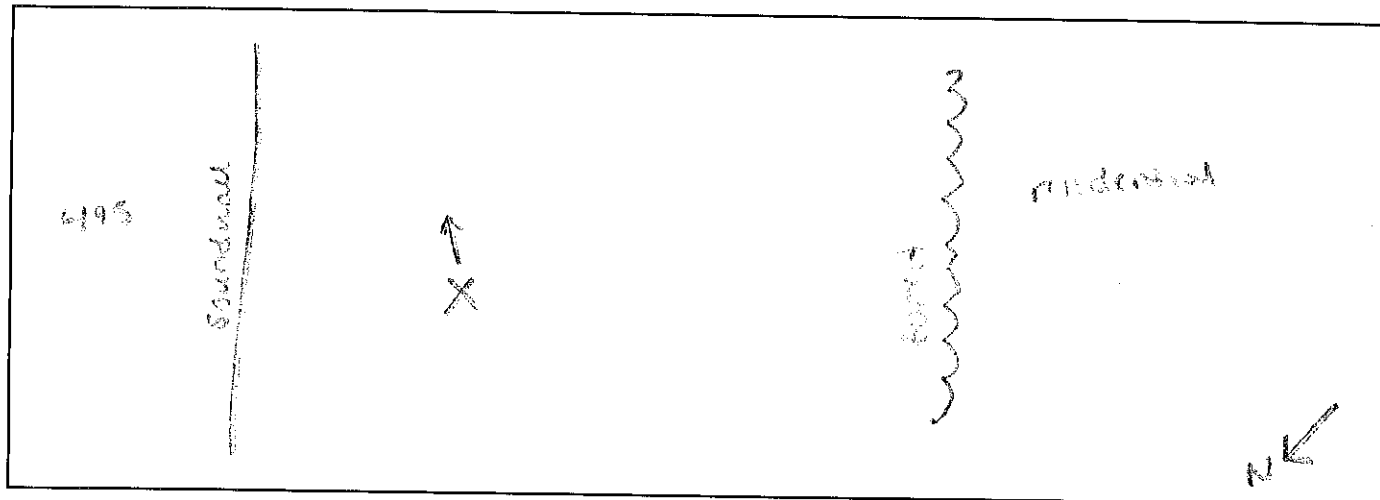
Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forested

Description of Habitat:

mixed oak forest adjacent to 495 soundwall. dense vines,
moderate invasion.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONG METER SM4 BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 2 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 5 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12db
Trigger Window	3s
Max Length	00 m : 15s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X8 State: MD County: Prince Georges
Site Address: APPROX. 0.03 MI E OF POWNATION ST and W of I-495 S.
Site Owner: STRONG TOWER APOST CHURCH OF AMERICA
Site Lat./Long. Coordinates: 38.9671736 N, 76.8688380 W
Site Photo Number: 6766
Person(s) Who Selected Acoustic Site: RCL/ENY
Person(s) who Deployed Detector: ENY, NCB

Night 1 -

Survey Date: 06/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one) Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

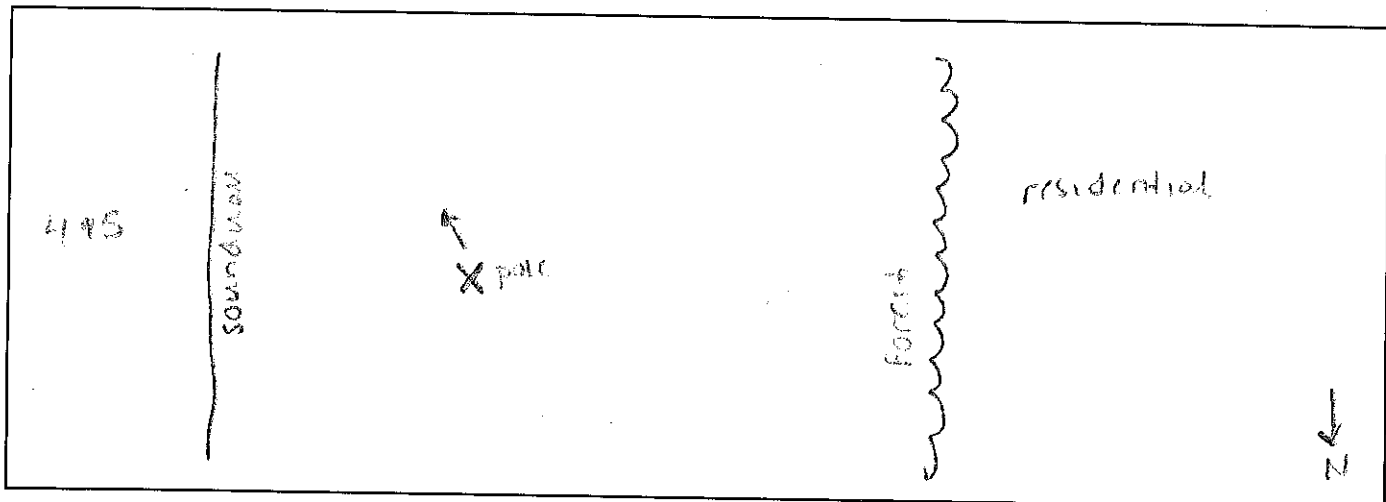
Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one) Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested

Description of Habitat:

swetbush/red maple forest adjacent to 495 corridor, some vines and invasives

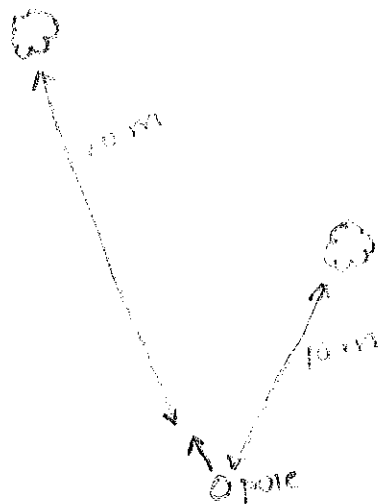
Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONG METER SM4 BAT FS
 Microphone Brand & Model: SMM-U2
 Microphone Type: OMNIDIRECTIONAL
 Type of Weatherproofing: N/A
 Microphone Height Above Ground-level Vegetation: 2 meters
 Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 10* meters
 Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °
 Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3 S
Max Length	00 m: 155
Compression	NONE



MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: X9 State: MD County: PRINCE GEORGES
 Site Address: APPROXIMATELY 0.9 mi NORTH OF IRONWOOD PI AND 0.24 mi SW OF THE I-495
 Site Owner: VERBA CORPORATION and US 50 interchange.
 Site Lat./Long. Coordinates: 38.9437563 N, 76.8614146 W
 Site Photo Number: 10
 Person(s) Who Selected Acoustic Site: RCL/EXG
 Person(s) who Deployed Detector: EXG/BLU

Night 1 -

Survey Date: 06/29/2020
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Night 2 -

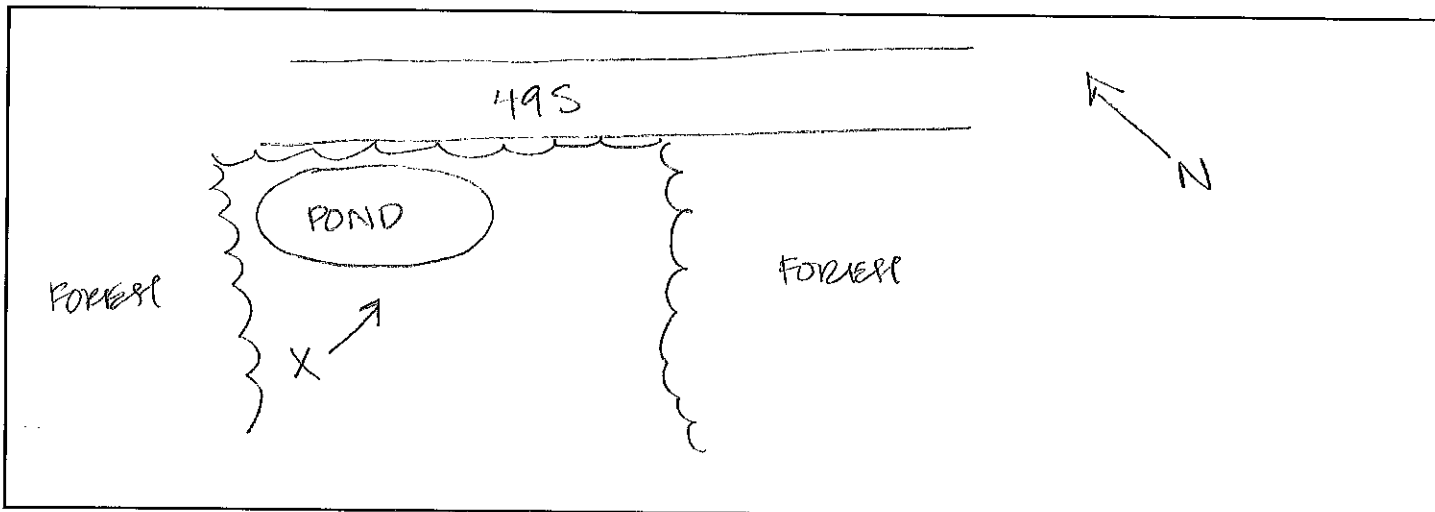
Survey Date: 06/30/2020
 Survey Start Time (military): 19:36 Survey End Time (military): 06:45
 General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
 Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): EDGE OF OPEN FIELD

Description of Habitat:

FORESTED EDGE OVERLOOKING OPEN FIELD NEARBY SWM POND

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METEK SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: Omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~6 meters

Horizontal Orientation of Microphone: 90 ° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 MS / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00m:15s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X10 State: MD County: PRINCE GEORGES
Site Address: APPROX. 360 ft E OF AMADOR DR and 150 ft W of I-495 S
Site Owner: PRINCE GEORGES COUNTY
Site Lat./Long. Coordinates: 38.9327161 N, 76.8553913 W
Site Photo Number: 6761-6762
Person(s) Who Selected Acoustic Site: EVA, RCL
Person(s) who Deployed Detector: EVA, NUB

Night 1 -

Survey Date: 06/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one) Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

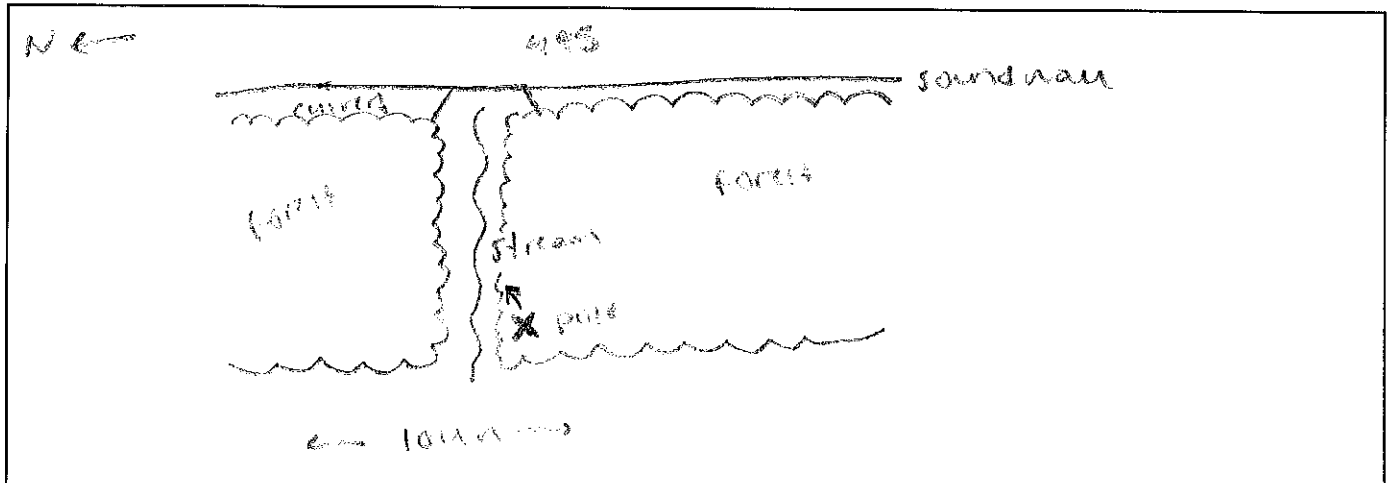
Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one) Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested stream

Description of Habitat:

Sweetgum/old maple/oak forest abutting 495. Perennial channel (concrete lined) bisects forest.

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-02

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

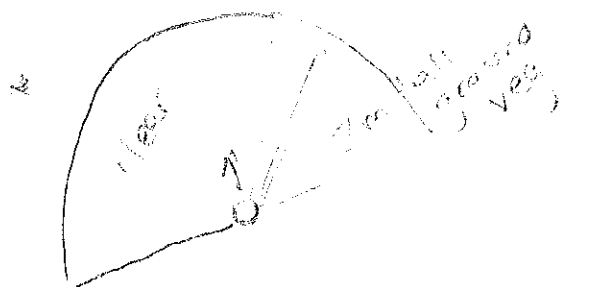
Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 15 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE



I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X11 State: MD County: PRINCE GEORGES
Site Address: APPDIX. D. 24 mi NE of INTERSECTION of BISHOP DEEDERS DR and BRIGHTSTAR RD.
Site Owner: RICHARDSON WILKINSON PROPERTIES LP
Site Lat./Long. Coordinates: 38.9097165 N, 76.8502305 W
Site Photo Number: 6757-6758
Person(s) Who Selected Acoustic Site: ELG, RCL
Person(s) who Deployed Detector: ELG, ALB

Night 1 -

Survey Date: 6/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

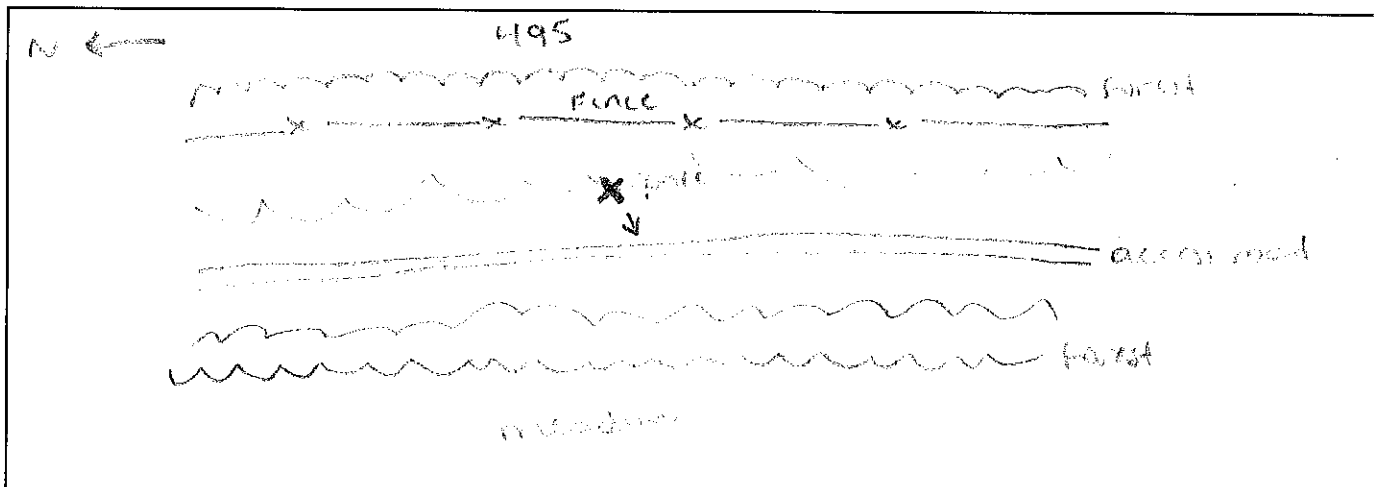
Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Forest

Description of Habitat:

Forest along 495 with water valve utility access road cutting through (red maple forest)

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters low ground veg

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 15 meters (tree)

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE.

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X12 State: MD County: Prince Georges
Site Address: Approx. 0.7 mi W of Harry S Truman Dr N and E of I-495 N
Site Owner: TYSONS TOWER
Site Lat./Long. Coordinates: 38.8982092 N, 76.8488343 W
Site Photo Number: 2705-2706 (7/14/20)
Person(s) Who Selected Acoustic Site: RCL/EYH
Person(s) who Deployed Detector: EYH, SP

Night 1 -

Survey Date: 7/13/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

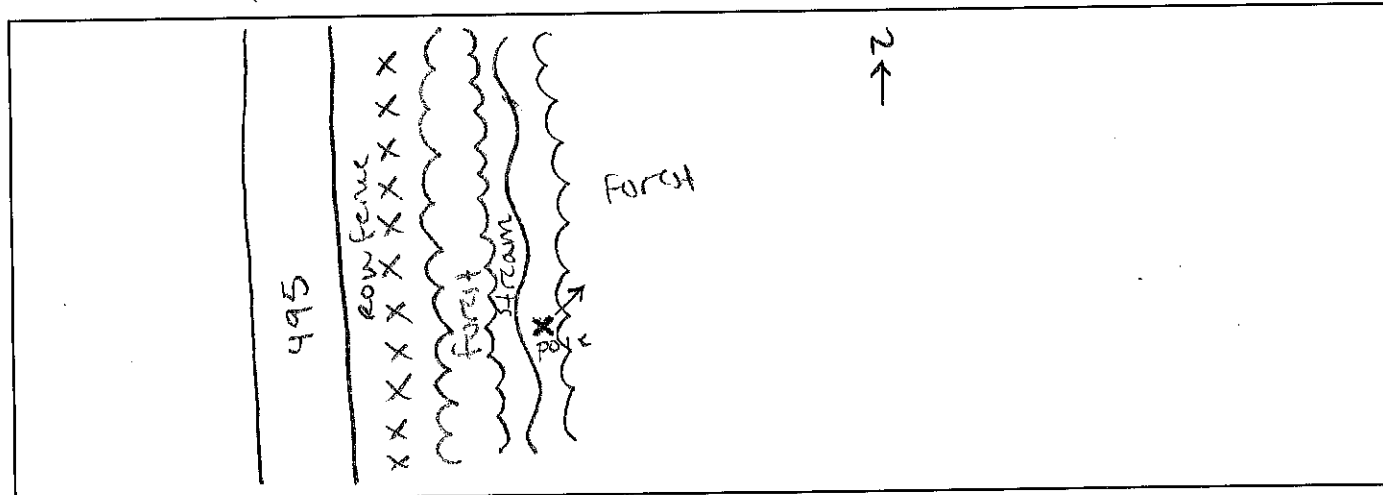
Survey Date: 7/14/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:51
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): forested stream

Description of Habitat:

forested stream running parallel to 495

Habitat Site Sketch (include north arrow):



Detector Brand & Model: Songmeter SM4BAT FS

Microphone Brand & Model: SMM-U2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): 4 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 kHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 kHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 m : 15 s
Compression	NONE

I-495 & I-270 Managed Lanes Study

Bat Acoustic Survey Record

Site ID Number: X13 State: MD County: PRINCE GEORGES
Site Address: West of I-495 south and approx 0.5 mi E of Hampton Park Blvd.
Site Owner: MDOT SHA
Site Lat./Long. Coordinates: 38.8757646 N, 76.8442927 W
Site Photo Number: 6756
Person(s) Who Selected Acoustic Site: RCL, EVER
Person(s) who Deployed Detector: EVN, NUB

Night 1 -

Survey Date: 06/24/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

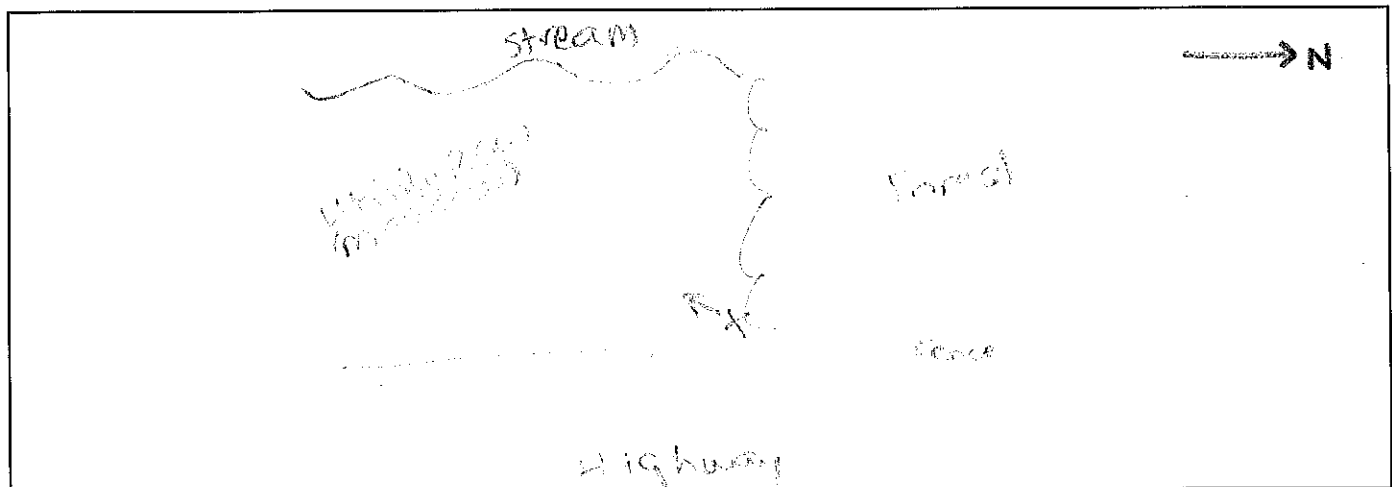
Night 2 -

Survey Date: 06/25/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:43
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): Meadow/utility easement adjacent to forest
Description of Habitat:

Sweetgum Forest with heavy vine and invasion along 495, borders a Category 1 utility easement/meadow

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONGMETER SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): > 30 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 dB
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 dB
Trigger Window	3 s
Max Length	00 m : 15 s
Compression	NONE

MANAGED LANE STUDY

Bat Acoustic Survey Record

Site ID Number: X14 State: MD County: PRINCE GEORGES.
Site Address: 0.03 mi W of off-ramp from PENNSYLVANIA AVE ONTO I-495 S
Site Owner: DOUGLAS DEVELOPMENT
Site Lat./Long. Coordinates: 38.8388062 N, 76.8699503 W
Site Photo Number: 09
Person(s) Who Selected Acoustic Site: RCL/EVG
Person(s) who Deployed Detector: EVG/SLY

Night 1 -

Survey Date: 06/29/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Night 2 -

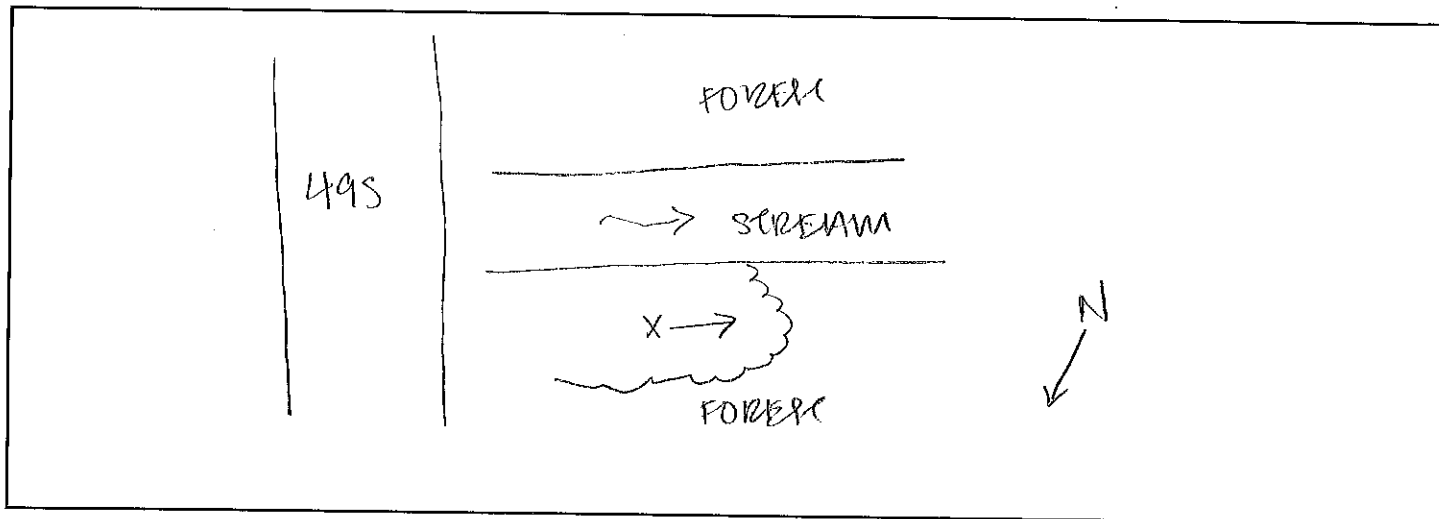
Survey Date: 06/30/20
Survey Start Time (military): 19:36 Survey End Time (military): 06:45
General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
Steady Rain; Thunderstorms

Habitat Type (e.g. forested stream, floodplain): OPEN FOREST ADJACENT TO OPEN FOREST.

Description of Habitat:

FORESTED STREAM HABITAT, SWEETGUM FOREST WITH THICK
UNDERSTORY

Habitat Site Sketch (include north arrow):



Detector Brand & Model: SONN METEK SM4BAT FS

Microphone Brand & Model: SMM-V2

Microphone Type: omnidirectional

Type of Weatherproofing: N/A

Microphone Height Above Ground-level Vegetation: 3 meters

Distance from Nearest Vegetation or Other Obstruction (apart from veg. on ground): ~6 meters

Horizontal Orientation of Microphone: 90° Vertical Orientation of Microphone: °

Calls Collected In (circle one): Full Spectrum; Zero Crossing

Detector Settings:

Sensitivity	
Gain	12 db
Data Division	N/A
16k High Filter	ON
Sample Rate	256 KHz
Min/Max Duration	1.5 ms / NONE
Min Trigger Frequency	16 KHz
Trigger Level	12 db
Trigger Window	3s
Max Length	00 m: 15s
Compression	NONE



APPENDIX E- PHOTOGRAPHIC LOG



Acoustic Location – 1



Acoustic Location – 1A



Acoustic Location – 1B



Acoustic Location – 1C



Acoustic Location – 1D



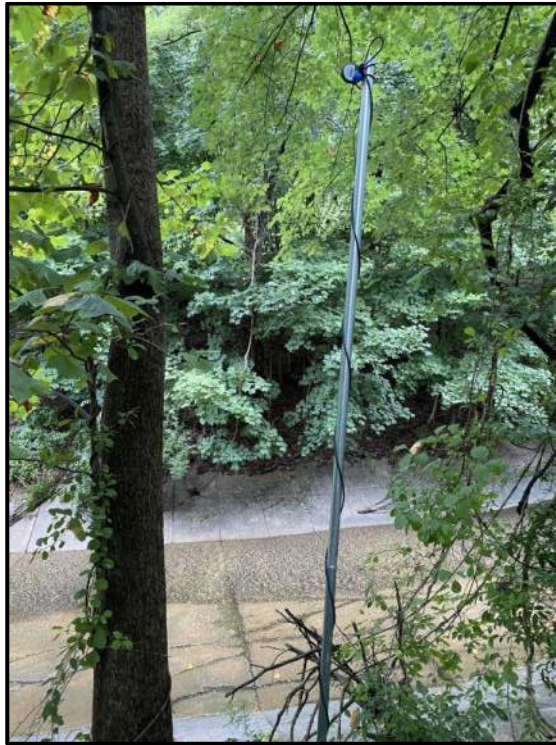
Acoustic Location – 2



Acoustic Location – 3



Acoustic Location – 3A



Acoustic Location – 4



Acoustic Location – 5



Acoustic Location – 5A



Acoustic Location – 6



Acoustic Location – 6A



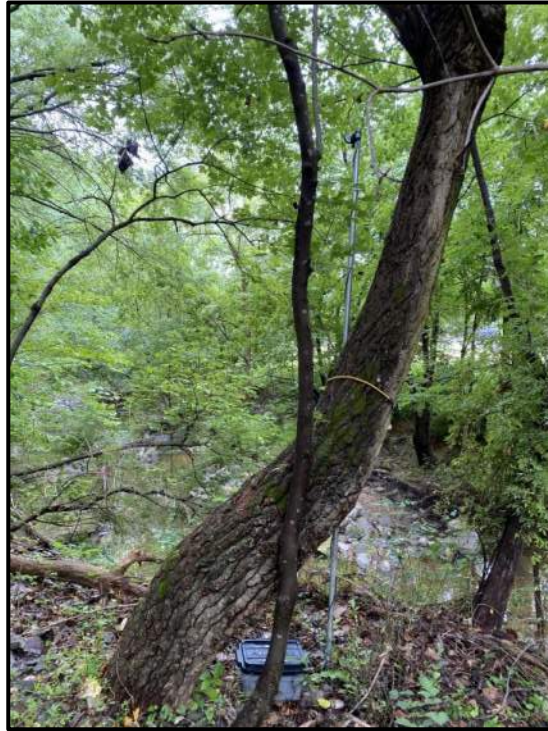
Acoustic Location – 8



Acoustic Location – 8A



Acoustic Location – 8B



Acoustic Location – 9



Acoustic Location – 11



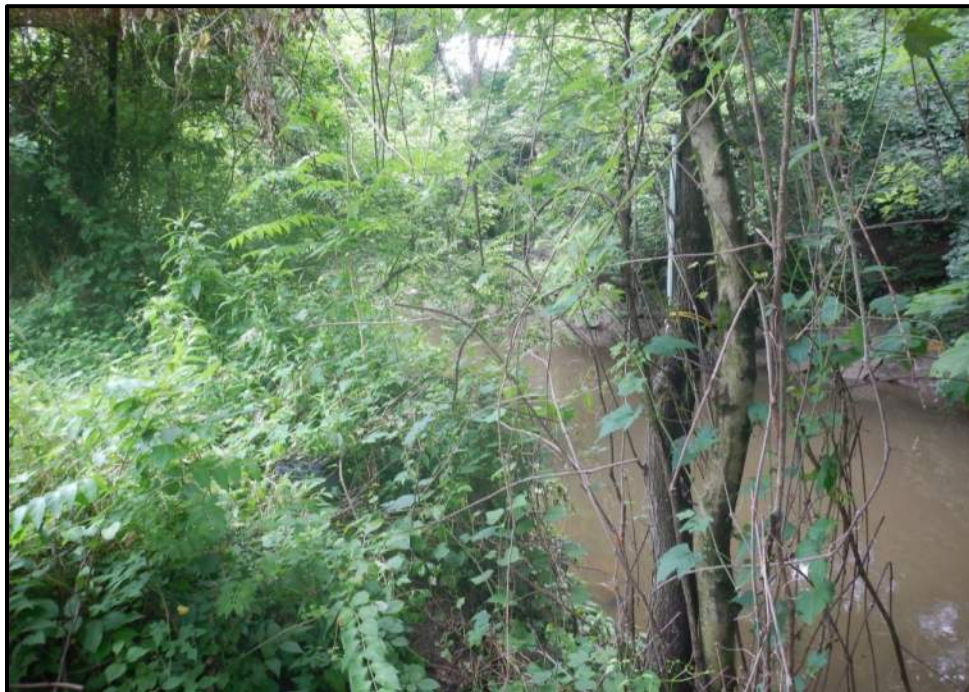
Acoustic Location – 11A



Acoustic Location – 12



Acoustic Location – 13



Acoustic Location – 13A



Acoustic Location – 14



Acoustic Location – 15



Acoustic Location – 16



Acoustic Location – 17



Acoustic Location – 18



Acoustic Location – 18A



Acoustic Location – 20



Acoustic Location – 22



Acoustic Location – 24



Acoustic Location – 24A



Acoustic Location – 24B



Acoustic Location – 25



Acoustic Location – 26



Acoustic Location – 27



Acoustic Location – 29



Acoustic Location – 30



Acoustic Location – 31A



Acoustic Location – 32



Acoustic Location – 33



Acoustic Location – 34A



Acoustic Location – 34B



Acoustic Location – 34C



Acoustic Location – 34D



Acoustic Location – 34E



Acoustic Location – 35



Acoustic Location – 35A



Acoustic Location – 35B



Acoustic Location – 36



Acoustic Location – 36A



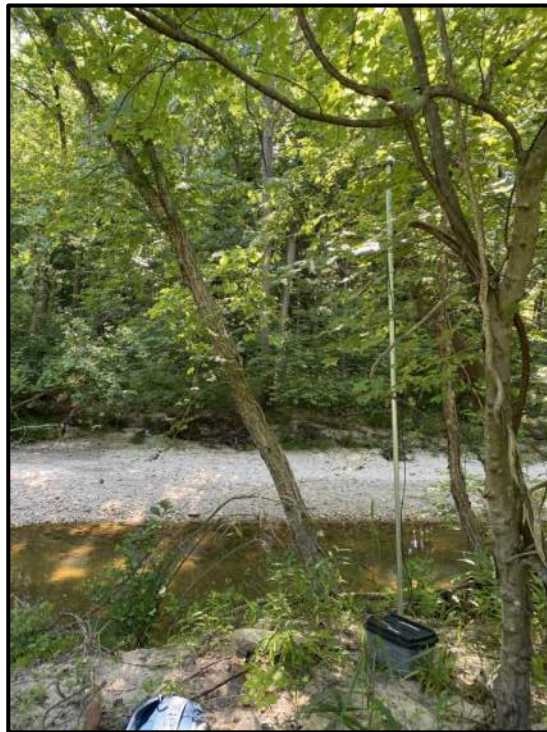
Acoustic Location – 36B



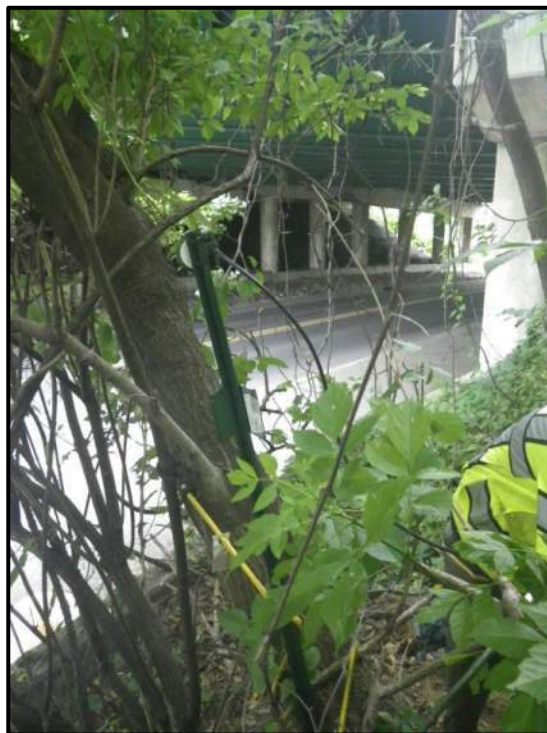
Acoustic Location – 36C



Acoustic Location – 36D



Acoustic Location – 38



Acoustic Location – 39 (Bridge – Seven Locks Road)



Acoustic Location – 40



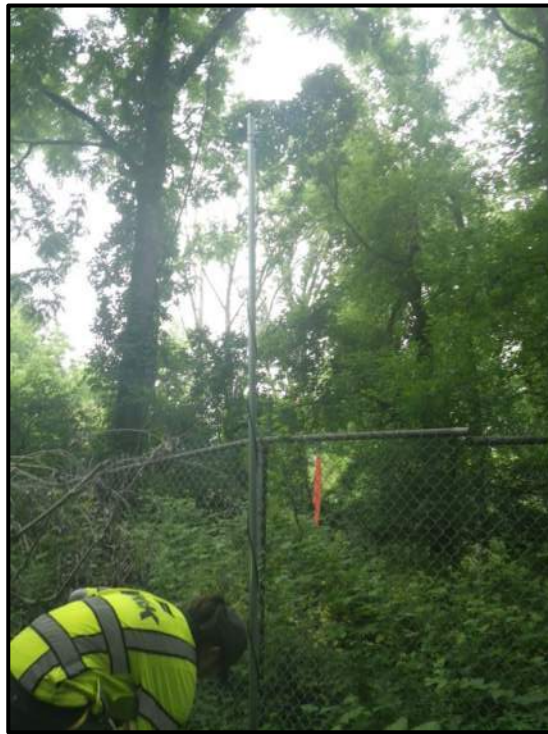
Acoustic Location – X1



Acoustic Location – X2



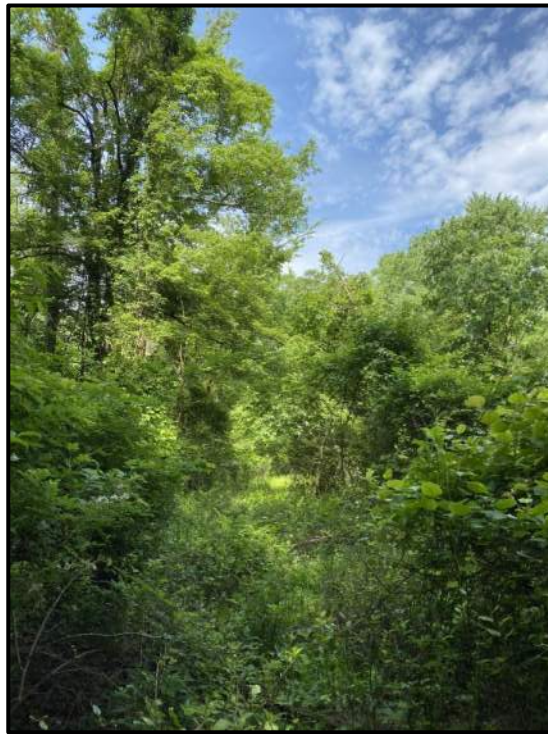
Acoustic Location – X3



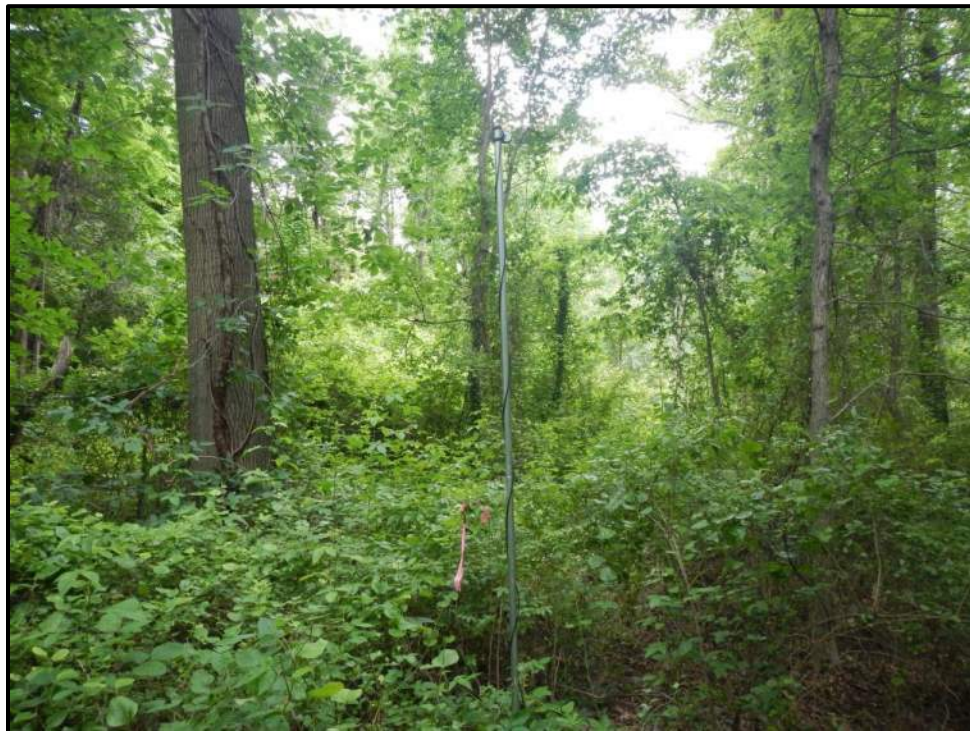
Acoustic Location – X4



Acoustic Location – X5



Acoustic Location – X6



Acoustic Location – X7



Acoustic Location – X8



Acoustic Location – X9



Acoustic Location – X10



Acoustic Location – X11



Acoustic Location – X12



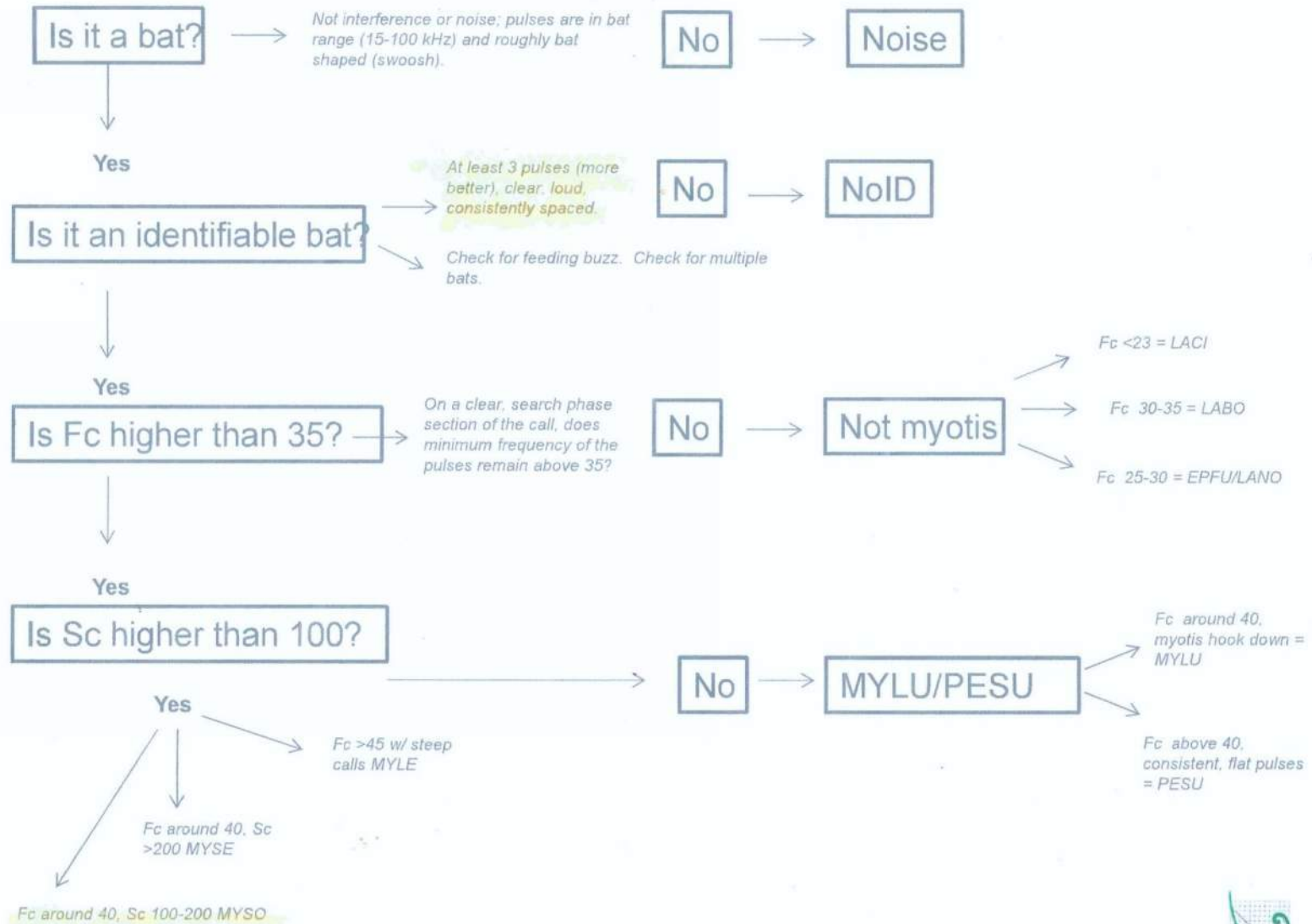
Acoustic Location – X13



Acoustic Location – X14



APPENDIX F- ERM VETTING KEY





APPENDIX G- MYOTIS VETTING TABLES

Myotis Vetting Appendix G-1											
Acoustic Location (PM)	Detector nights	# Detectors	Field Complete	Kpro Call Analysis KALEIDOSCOPE 5.1.0		Auto ID Manual Vetting Needed	Notes		Notes	Manual Vetting Complete	TE Species
				Night 1	Night 2	Night 1		Night 2			
1	2	1	x	X	X	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
1A	2	1	x	X	X	X- MYLU, MYSO	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO. ID'd MYSO call only had 2 pulses, 3 required.	X- MYLU, MYSO	MYSO-minimal pulses(3), P value of 1.	x	No
1B	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X- MYLU	Sc values are higher than 100, potential MYSO P-value 1 doesn't indicate MYSO.	x	No
1C	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
1D	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
2	2	1	x	X	X	X-MYLU	Sc values are higher than 100. P-values also indicate no MYSO	NA		x	No
3	2	1	x	X	X	X- MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
3A	2	1	x	X	X	X- MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X	No
4	2	1	x	X	X	X-MYLU	One call has 108 Sc however, only 2 pulses in the call sequecnce, 3 required. P-value does not indicate MYSO.	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
5	2	1	x	X	X	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
5A	2	1	x	X	X	NA		NA		x	No
6	2	1	x	X	X	X- MYSO	P-value suggests No, but Fc/Sc suggest yes.	MYSE	N2-Fc too low for both calls(33.7&35.2) Sc too low for both calls (145.2&171) P-value suggests Pres.	x	No
6A	2	1	x	X	X	X-MYLU	1 Sc value is higher than 100. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
8	2	1	x	X	X	X-MYLU	P values do not indicate MYSO.	NA		x	No
8A	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
8B	2	1	x	X	X	X-MYLU MYSO	MYLU-Fc of 47.4, too high for MYSO. MYSO- Sc too low-12.85 for MYSO. Sc should be higher than 100 for MYSO.	NA		x	No
9	2	1	x	X	X	NA		X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
11	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
11A	2	1	x	X	X	NA		X-MYLU	P values do not indicate MYSO.	x	
12	2	1	x	X	X	NA		NA		x	No
13	2	1	x	X	X	NA		NA		x	No
13A	2	1	x	X	X	NA		X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
14	2	1	x	X	X	NA		X - MYLUC	Fc too high(47.7) for MYSO, Sc too low(139.1) for MYSE. P-values do not indicate either species.	x	No
15	2	1	x	X	X	NA		X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
16	2	1	x	X	X	NA		X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
17	2	1	x	X	X	X - MYLU	P values do not indicate MYSO.	X - MYLU	P values do not indicate MYSO.		
18	2	1	x	X	X	X - MYLU, MYSE	MYSE- P value, 0.008, presence assumed. MYLU review for MYSO	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	YES
18A	2	1	x	X(N2)	X(N3)	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	NA		x	No
20	2	1	x	X	X	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
22	2	1	x	X	X	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X - MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
24	2	1	x	X	X	NA		NA			No
24A	2	1	x	X	X	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X- MYSE	P value indicates presence, 0.023. Sc Value supports MYSE, Fc value a little low, but MYSE assumed.	x	Yes
24B	2	1	x	X	X	NA		NA		x	No
25	2	1	x	X	X	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
26	2	1	x	X	X	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No

27	2	1	x	X	X	x-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	NA		x	No
29	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU MYSE	MYLU-Sc values rule out MYSO, along with P-value. MYSE- Ss too low for MYSE.	x	No
30	2	1	x	X	X	X-MYLU	Sc values warrant a second look for one call, Sc value within range of MYSO, but P-value 1.	NA		x	No
31A	2	1	x	X	X	NA		NA		x	No
32	2	1	x	X	X	NA		MYLU	P values do not indicate MYSO.	x	No
33	2	1	x	X	X	NA		MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
34A	2	1	x	X	X	X-MYLU	Some calls meeting MYSO Fc/ Sc requirements but P values do not indicate MYSO	X- MYSO	Some calls meeting MYSO Fc/ Sc requirements but P values do not indicate MYSO	x	No
34B	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	NA		x	No
34C	2	1	x	X	X	X-MYLU/MYSO	Some calls meeting MYSO Fc/ Sc requirements but P values do not indicate MYSO	X-MYSO	Some calls meeting MYSO Fc/ Sc requirements but P values do not indicate MYSO	x	No
34D	2	1	x	X	X	NA		MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
34E	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	NA		x	No
35	2	1	x	X	X	NA		X-MYLU	Sc values warrant a second look for one call	x	No
35A	2	1	x	X	X	NA		NA		x	No
35B	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
36	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	NA		x	No
36A	2	1	x	X	X	NA		NA		x	No
36B	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	NA		x	No
36C	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
36D	2	1	x	X	X	NA		NA		x	No
38	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
39	2	1	x	X	X	NA		NA		x	No
40	2	1	x	X	X	NA	NA	NA		x	No
X1	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
X2	2	1	x	X(N2)	X(N3)	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	Some calls meeting MYSO Fc/ Sc requirements but P values do not indicate MYSO	x	No
X3	2	1	x	X	X	NA		NA		x	No
X4	2	1	x	X	X	NA		X- MYSE	Fc/Sc match MYSE	x	Yes
X5	2	1	x	X	X	X-MYLU/MYSE	MYSE P value- pres, Fc values (36.8 & 34.6) do not support MYSE Pres.	X-MYLU	Sc values warrant a second look for calls-MYSO; P values do not indicate MYSO.	x	No
X6	2	1	x	X	X	X-MYLU/MYSE	P values do not indicate MYSE. Sc value too low for MYSE.	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
X7	2	1	x	X	X	X-MYLU	No calls with pulse minimum(3) with Sc over 100	NA		x	No
X8	2	1	x	X	X	X-MYLU	1 call with pulse minimum(3) with Sc over 100,Sc values warrant a second look for one call, P values do not indicate MYSO	NA		x	No
X9	2	1	x	X	X	NA		X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
X10	2	1	x	X	X	X-MYSE,MYLU	MYSE-P value indicates pres however, Sc/Fc values do not support this.	X-MYLU	Sc values warrant a second look for 3 calls. P value does not support pres of MYSO.	x	No
X11	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
X12	2	1	x	X	X	X-MYLU,MYSE	MYSE-P value indicates pres however, Sc/Fc values do not support this.	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no	x	No
X13	2	1	x	X	X	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	X-MYLU	No Sc values are higher than 100, this rules out MYSO for all the calls. P-values also indicate no MYSO	x	No
X14	2	1	x	X	X	X-MYSE	MYSE-P value indicates pres however, Sc/Fc values do not support this.	NA			
	142										
				A MLE p-value of 0.05 has been set as the threshold for assessing software accuracy with p-values ≤0.05 indicating a species is likely present and p-values >0.05 indicating probable absence.							
	132 detector night required										

Myotis Vetting Worksh Appendix G-2																																
DATE	TIME	DATE-12	AUTO ID*	PULSES	MATCHING	MATCH RATIO	MARGIN	ALTERNATE	ALTERNATE	Fc	Sc	Dur	Fmax	Fmin	Fmean	TBC	Fk	Tk	S1	Tc	Qual	FILES	Site	Night	Kaleidoscope P-value (MYSE/MYSO)	ID Notes						Vetted ID
Wildlife Acoustics KALEIDOSCOPE 5.1.0																																
Site 18																																
7/9/2020	20:56:54	7/9/2020	MYOSEP	12	7	0.583	0.10817	MYOSOD		37.846	170.53	3.178	60.827	35.046	44.589	140.191	42.205	1.898	401.96	2.71	4.15	1	18	1	0.008	MYSE					MYSE	
7/9/2020	22:23:23	7/9/2020	MYOSEP	6	3	0.5	0.14473	MYOLUC	MYOSOD	36.939	99.66	3.643	64.049	35.917	46.348	164.182	40.054	2.637	438.08	3.493	1.59	1	18	1	0.008	MYSE					MYSE	
Site 29																																
7/15/2020	4:32:33	7/14/2020	MYOSEP	5	2	0.4	0.13215			35.712	141.02	2.53	47.424	34.128	39.467	68.6	40.271	1.123	313.72	2.257	1.01	1	29	2	0.144	MYSE	Sc too low for MYSE				LABO	
Site 34C																																
6/25/2020	1:50:59	6/24/2020	MYOLUC	72	24	0.333	0.14196	MYOSOD	LASBOR	41.158	103.06	2.976	58.985	40.595	46.577	151.403	44.87	1.723	416.05	2.843	14.77	1	34C	1	0.829909	MYSO?	Many calls here meet MYSO requirements.	MYLU				
6/25/2020	0:09:15	6/24/2020	MYOLUC	87	19	0.218	0.113	MYOSOD		40.011	117.03	2.995	59.12	39.264	45.829	167.609	43.879	1.733	387.32	2.845	18.9	1	34C	1	0.829909	MYSO?	However, P-Values do not show presence.	MYLU				
6/25/2020	2:22:03	6/24/2020	MYOLUC	41	17	0.415	0.15719	MYOSOD	LASBOR	41.29	101.46	2.981	58.921	40.502	46.441	139.241	44.533	1.741	403.63	2.766	9.5	1	34C	1	0.829909	MYSO?	Likely MYLU Calls				MYLU	
6/25/2020	5:05:11	6/24/2020	MYOLUC	51	11	0.216	0.12467	MYOSOD	LASBOR	41.693	105.24	3.044	61.001	41.036	47.56	178.682	45.475	1.858	384.79	2.915	11.12	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:00:53	6/24/2020	MYOLUC	21	8	0.381	0.15658	MYOSOD	LASBOR	40.376	106.82	2.988	58.171	39.943	45.846	112.944	43.869	1.761	434.83	2.867	4.43	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	2:21:30	6/24/2020	MYOLUC	24	8	0.333	0.12591	MYOSOD		41.168	118.63	3.001	62.197	40.65	47.638	183.462	45.052	1.855	440.68	2.899	5.81	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:58:16	6/24/2020	MYOLUC	53	8	0.151	0.10614	MYOSOD	LASBOR	40.368	109.23	3.098	59.135	39.984	46.216	219.39	43.982	1.857	403.9	2.995	11.16	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:32:50	6/24/2020	MYOLUC	54	8	0.148	0.09261	MYOSOD		41.239	116.29	2.621	56.909	40.695	46.139	256.392	44.844	1.475	360.08	2.47	11.93	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:32:50	6/24/2020	MYOLUC	54	8	0.148	0.09261	MYOSOD		41.239	116.29	2.621	56.909	40.695	46.139	256.392	44.844	1.475	360.08	2.47	11.93	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:32:50	6/24/2020	MYOLUC	54	8	0.148	0.09261	MYOSOD		41.239	116.29	2.621	56.909	40.695	46.139	256.392	44.844	1.475	360.08	2.47	11.93	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:46:32	6/24/2020	MYOLUC	16	5	0.313	0.12229	MYOSOD		40.255	117.36	3.023	57.96	39.249	45.706	463.579	45.198	1.561	404.56	2.844	3.95	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:42:24	6/24/2020	MYOLUC	27	5	0.185	0.12899	MYOSOD	LASBOR	40.041	102.71	2.999	57.312	39.543	45.564	278.744	43.557	1.74	282.5	2.891	6.11	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:59:46	6/24/2020	MYOLUC	10	4	0.4	0.19465	MYOSOD	LASBOR	40.668	107.07	2.79	55.88	40.067	45.534	323.52	44.554	1.503	282.9	2.641	1.76	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:48:48	6/24/2020	MYOLUC	11	4	0.364	0.19055	LASBOR	MYOSOD	41.08	123.17	3.266	61.982	40.473	47.311	370.649	45.888	1.777	461.75	3.053	2.58	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:42:52	6/24/2020	MYOLUC	13	4	0.308	0.13897	MYOSOD	LASBOR	40.328	111.35	3.337	60.581	39.848	46.494	285.027	44.41	1.797	371.97	3.116	3.67	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:47:37	6/24/2020	MYOLUC	14	4	0.286	0.17358	MYOSOD		40.327	125.15	2.889	58.768	39.998	46.471	399.22	44.905	1.601	365.58	2.816	3.64	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:50:08	6/24/2020	MYOLUC	14	4	0.286	0.17866	MYOSOD	LASBOR	39.153	100.95	3.226	56.002	38.837	44.474	279.093	42.738	1.88	381.11	3.132	2.4	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	22:00:57	6/24/2020	MYOLUC	15	4	0.267	0.18936	MYOSOD		40.894	118.02	3.315	61.866	40.044	46.877	292.523	45.069	1.822	305.86	3.071	2.89	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:39:42	6/24/2020	MYOLUC	20	4	0.2	0.09966			38.956	113.64	2.924	56.488	38.686	44.679	190.048	42.076	1.795	423.08	2.813	4.42	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:44:08	6/24/2020	MYOLUC	12	3	0.25	0.13744	MYOSOD	LASBOR	39.333	125.29	3.252	59.982	39.006	45.989	146.476	43.603	1.951	448.65	3.15	2.94	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:02:24	6/24/2020	MYOLUC	14	3	0.214	0.16933	MYOSOD	LASBOR	41.131	104.5	2.526	55.185	40.655	45.425	354.925	43.966	1.494	415.33	2.384	2.89	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:54:54	6/24/2020	MYOSOD	26	12	0.462	0.13085	MYOLUC	LASBOR	40.197	106.69	2.778	55.57	39.73	44.962	215.506	43.922	1.559	381.61	2.667	6.46	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:09:50	6/24/2020	MYOSOD	20	10	0.5	0.13141	MYOLUC		40.554	113.71	2.863	58.799	40.254	46.427	267.676	44.581	1.666	485.21	2.813	4.65	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	0:19:50	6/24/2020	MYOSOD	6	3	0.5	0.21649	MYOLUC		40.174	111.13	2.163	51.697	40.108	44.107	341.792	44.271	0.988	346.7	2.146	1.25	1	34C	1	0.829909	MYSO?					MYLU	
6/24/2020	21:52:12	6/24/2020	MYOSOD	5	2	0.4	0.13011	MYOLUC		40.84	138.62	2.412	56.989	40.598	46.148	382.408	45.258	1.222	421.98	2.313	1.18	1	34C	1	0.829909	MYSO?					MYLU	
6/25/2020	22:03:58	6/25/2020	MYOLUC	30	10	0.333	0.13303	MYOSOD	LASBOR	40.811	105.79	2.608	55.615	40.562	45.535	135.419	44.671	1.416	431.83	2.514	6.65	1	34C	2	0.4403029	MYSO?	Many calls here meet MYSO requirements.	MYLU				
6/25/2020	21:59:56	6/25/2020	MYOLUC	32	6	0.188	0.08534	MYOSOD		37.165	109.48	2.738	53.766	36.51	42.055	224.694	39.962	1.654	454.15	2.593	7.1	1	34C	2	0.4403029	MYSO?	However, P-Values do not show presence.	MYLU				
6/25/2020	21:23:38	6/25/2020	MYOLUC	14	4	0.286	0.1205	LASBOR		38.982	109.86	2.934	55.62	38.675	44.079	254.939	43.043	1.637	418.23	2.854	3.2	1	34C	2	0.4403029	MYSO?	Likely MYLU Calls				MYLU	
6/25/2020	23:28:29	6/25/2020	MYOLUC	20	4	0.2	0.07877	MYOSOD	LASBOR	41.114	113.18	2.613	56.005	40.591	45.583	220.868	44.942	1.385	388.28	2.466	4.37	1	34C	2	0.4403029	MYSO?					MYLU	
6/25/2020	21:56:18	6/25/2020	MYOLUC	3	1	0.333	0.11274	MYOSOD	MYOSEP	39.563	132.32	2.283	53.515	39.373	44.475	506.485	43.557	1.287	399.96	2.248	1.08	1	34C	2	0.4403029	MYSO?					MYLU	
6/26/2020	0:41:28	6/25/2020	MYOSOD	18	11	0.611	0.19744	MYOLUC		41.875	120.61	2.593	57.278	40.775	46.327	213.116	46.174	1.268	402.42	2.366	3.63	1	34C	2	0.4403029	MYSO?					MYLU	
6/26/2020	1:14:15	6/25/2020	MYOSOD	6	5	0.833	0.24118	MYOLUC		40.756	136.99	2.807	63.956	40.685	47.676	129.82	46.272	1.458	627.49	2.791	1.24	1	34C	2	0.4403029	MYSO?					MYLU	
Site X4																																
6/19/2020	2:39:46	6/18/2020	MYOSEP	8	5	0.625	0.1786			35.676	241.74	3.519	68.986	32.785	45.287	104.557	42.504	1.89	531.3	2.994	1.29	1	X4	2	0.0619461	MYSE	P-value very close to 0.05, Presence Assum	MYSE				
Site 24A																																
6/24/2020	4:26:21	6/23/2020	MYOSEP	6	4	0.667	0.22812			35.126	193.82	2.464	53.087	32.781	40.507	86.29	40.52	1.268	472.62	2.141	1.42	1	24A	2	0.0233266	MYSE					MYSE	



APPENDIX H- RESUMES



RYAN LEIBERHER

SENIOR BIOLOGIST PROJECT MANAGER

Education

BS/ Environmental
Biology/Edinboro University / 2000
AS/ Wildlife Technology/ Penn
State University / 1998

Years of Experience

20+

Areas of Expertise

Natural Resources Departmental
Management
Threatened / Endangered Species
Wetlands & Watercourses
Permitting
NEPA

Registration/Certification

USFWS Certified/ Approved Bat
Surveyor Region 5

Professional Societies/Affiliates

Pennsylvania Chapter of the Wildlife
Society
NEBWG-North Eastern Bat working
Group

Specialized Training

2017- ERM/Wildlife Acoustics- Bat
Acoustics Training Course
2004- Bat Conservation International
Workshop
Acoustical Monitoring Bat Training
2001- Bat Conservation
International Workshop
2000- Present: Continual Infield
bat training with the PGC

Mr. Leiberher has more than 20 years of professional experience as a natural resources biologist. His project work has required multi-office interactions and coordination with regional and national clients. He has been involved in many projects for oil and gas, transportation, infrastructure, commercial, industrial and residential development that have required strong client working relationships. Mr. Leiberher has experience interacting with federal and state agencies on a variety of natural resources topics including Threatened and Endangered Species surveys. He has experience with the Endangered Species Act (ESA) and the Section 7 consultation process associated with projects affecting the Indiana bat and other bat species in the northeast.

Mr. Leiberher has experience writing various wildlife survey reports, wetland identification and delineation reports, environmental assessment forms, joint permit applications, general permits and is familiar with the 404/105 process. In addition, he has excellent working relationships with various state and federal agencies.

T&E Bat Experience

Responsible for the coordination and implementation of many T&E bat species surveys. Specific tasks include: mist netting, acoustics, harp trapping, habitat assessment, radio telemetry, hibernacula surveys, expert peer review, agency coordination, conducts T&E bat surveying training, and conducts T&E bat presentations (public and private). He has experience identifying all bat species known to occur in the northeastern US.

Wildlife Biologist – Various Confidential Clients, Pennsylvania, New York, West Virginia, Maryland, Virginia, New Jersey: Indiana Bat (*Myotis sodalis*) and Northern Long Eared bat (*Myotis septentrionalis*): Assessments

Lead T&E bat surveyor for numerous projects- responsible for the identification of potential T&E bat habitat, management plans, study plans, habitat conservation plans, and state and federal agency coordination.

Lead Biologist – Shell Appalachia Falcon Pipeline Project, West Virginia: Acoustic Bat Survey

Responsible for the location and identification of the T&E Bat Habitat, the creation of a study plan following USFWS protocol and acoustic surveys conducted at the site. Conducted acoustical call analysis using Kaleidoscope Pro Software in addition to manual call vetting.

Lead Biologist – Dupont Nursery Properties Project, Waynesboro, Virginia: Acoustic Bat Survey

Responsible for the location and identification of the T&E Bat Habitat, a habitat assessment, the creation of a study plan following USFWS protocol and acoustic surveys conducted at the site. Conducted acoustical call analysis using Kaleidoscope Pro Software in addition to manual call vetting.

Project Manager / Lead Biologist – Waste Management Landfill Expansion Project, Rochester, New York: Acoustic Bat Survey

Responsible for the location and identification of the T&E Bat Habitat, the creation of a study plan following USFWS protocol and acoustic surveys conducted at the site. Conducted acoustical call analysis using Kaleidoscope Pro Software in addition to manual call vetting.

Lead Biologist- Long Boat Key Bat Bridge (FLDOT), FL: Bat Colony Survey

Responsible for bat habitat assessment, the creation of a study plan, and implementation of the study plan for a for a bridge replacement project that impacted a large bat colony. The project involved a bat identification, location and exclusion effort for a high density bat colony underneath a bridge crossing long boat pass.

Lead Biologist - Cabot Oil and Gas Project, Susquehanna County, PA: Indiana Bat (*Myotis sodalis*) Mist Net Survey

Lead USFWS Indiana bat surveyor for the project and worked in conjunction with URS Corporation, the prime consultant on the project, responsible for the identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan.

Lead Biologist – EQT Sunrise Project, Wetzel and Doddridge County, WV and Greene County, PA: Indiana Bat (*Myotis sodalis*) Mist Net Survey

Mr. Leiberher was responsible for the identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan. URS Corporation, the prime consultant on the project, was responsible for conducting Indiana bat mist netting surveys working in conjunction with ESI Corporation.

Lead Biologist - Indiana Bat Survey - Monfayette Transportation Project, Allegheny County, PA

Responsible for preliminary and detailed mine opening surveys as well as mist netting surveys. Mine opening suitability was determined using Pennsylvania Game Commission, "Criteria for determining whether abandoned coal mines provide potentially suitable bat habitat." Detailed harp trap surveys were conducted upon completion of the preliminary surveys.

Lead Biologist – Natrium Project, Marshall County, WV: Indiana Bat (*Myotis sodalis*) Mist Net Survey

Mr. Leiberher was responsible for the identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan and conducted the Indiana bat mist netting surveys, and agency coordination for the project.

Project Manager / Biologist- Knight Road Bat Bridge (PENNDOT), Montgomery County, PA: Indiana Bat (*Myotis sodalis*) Maternity Colony Survey

Responsible for agency coordination, the creation of a study plan, and implementation of the study plan for a for a bridge replacement project that impacted a bat maternity colony. The project involved a trapping effort for a high density maternity roost colony underneath a bridge. The effort consisted of an emergence count followed by an extensive harp trapping within the entire bridge span in order to estimate bat population size and species distribution.

Lead Biologist / Instructor - Indiana Bat Regulatory Training – PENNDOT Training Course

Responsible for the creation and presentation of a regulatory training program specific to the Indiana bat. This program included information related to Indiana bat Biology and the Indiana bat related to the regulatory process.

Lead Biologist - Indiana Bat Expert Peer Reviewer - S.R. 22 Blair County, PA

Acted as a professional reviewer of the ESA Section 7 Biological Assessment for the project, created to comply with the requirements of the ESA.

Lead Biologist - Indiana Bat Surveys – South Valley Parkway Project, Luzerne County, PA

Responsible for the location and identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan including detailed habitat assessments, preliminary survey plans, and coordination with the USFWS for the project, also responsible for preliminary and detailed mine opening surveys as well as mist netting surveys for the project.

Wildlife Biologist - Route 15 Project, Tioga County, PA

Responsible for the location and identification of the Indiana Bat Habitat and the creation of a study plan following USFWS protocol and Indiana bat mist netting surveys, also responsible for studies concerning the Osprey, Great Blue Heron, and Vernal Pool Habitat.

Lead Biologist / Aquatic Resource Assistant Central Susquehanna Valley Transportation Improvement Project, Snyder County, PA - Indiana Bat Survey

Conducted Indiana bat surveys including mist netting and mine opening surveys, including harp trapping, and internal mine opening assessment for the Indiana bat and other bat species, responsible for locating the habitat of the Eastern Spadefoot Toad in the project area, assisted in FGM stream work in the project area, and assisted in location and identification of the Rough Green Snake and its habitat.

Project Manager / Lead Biologist - Indiana Bat Habitat Assessment and Bat habitat Management plan Creation and Implementation- Gettysburg Commons Project, Gettysburg PA

Responsible for the location and identification of Indiana bat habitat, creation of a habitat management plan, and implementation of the management plan for the project. Worked closely with USFWS PA FO to develop management plan details.

Lead Biologist - Scranton Lackawanna Industrial Building Company (SLIBCO), Lackawanna County, PA: Indiana Bat (*Myotis sodalis*) Mist Net/Hibernacula Survey

Responsible for the identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan. Conducted summer habitat mist net surveys as well as fall hibernacula emergence trapping associated with the project in Lackawanna County, PA.

Lead Biologist- State Route 2 Widening Project (WVDOT), Jefferson County, WV: Indiana Bat (*Myotis sodalis*) Mist Net Survey

Responsible for the identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan. Conducted an extensive mist net survey for the Route 2 road widening project for the West Virginia Department of Transportation.

Project Manager / Lead Biologist - Development Authority of the North Country Expansion Project, Rodman, New York: Indiana Bat Survey

Responsible for the identification of Indiana bat habitat, the development of a study plan for the project and the completion of an Indiana bat mist netting survey required by NYDEC and the USFWS as part of Section 7 Consultation for the project.

Lead Biologist - Indiana Bat Survey - Falcon Project, Beaver County, PA

Responsible for the identification of Indiana bat habitat, the development of a study plan for the project and the completion of an Indiana bat mist netting survey required by USFWS as part of consultation for the project.

Lead Biologist / Instructor - Indiana Bat Regulatory Training – Williams Midstream Training Course

Responsible for the creation and presentation of a regulatory training program specific to the Indiana bat and other bat species of the

Lead Biologist– Pennsylvania Department of Transportation (PENNDOT): Indiana Bat (*Myotis sodalis*) Habitat Assessment, New Stanton Project

Lead USFWS Indiana bat surveyor- responsible for the identification of potential Indiana bat habitat, management plans, study plan, habitat conservation plans, and state and federal agency coordination.

Wildlife Biologist – Frey Wind farm Project, PA: Bat Identification

Mr. Leiberher was responsible for the identification of bat species carcasses collected at the project site.

Project Manager / Lead Biologist - Lowe's Companies Inc., Sussex and Orange County, NJ: Indiana Bat Survey

Responsible for the identification of Indiana bat habitat, the creation of a study plan, and implementation of the study plan, which included an Indiana bat mist netting survey following New Jersey Department of Environmental Protection (NJDEP) & USFWS protocol.

Lead Biologist- Purple Line MTA, Maryland – Bat Protection Plan

Worked in conjunction with Maryland USFWS, FTA and MTA to develop a T&E bat protection plan. Conducted ESA Section 7 agency coordination and created a desktop habitat suitability model for determination of Threatened and Endangered bat species within the impact area, characterized forested areas and other features according to suitability as habitat for Indiana bat and Northern long-eared bat in the Purple Line impact area.

Volunteer Experience- PGC:

Wildlife Biologist – Canoe Creek Mine Internal Survey and Bat Counts- Assisted PGC with internal surveys and bat counts in the pre-white nose syndrome era.

Wildlife Biologist – Canoe Creek Mine Harp Trapping Surveys- Assisted PGC with harp trapping surveys during the pre- white nose syndrome era.

Wildlife Biologist – Canoe Creek Church/Condo Internal Survey and Bat Counts- Assisted PGC with internal roost surveys and bat counts in the pre-white nose syndrome era.

Wildlife Biologist – Canoe Creek Radio Telemetry Surveys- Assisted PGC with *Myotis lucifugus* foraging and travel telemetry in the pre-white nose syndrome era.

Wildlife Biologist – Canoe Creek Route 22 Bat Crossing Counts and morality surveys- Assisted PGC with internal bat counts and traffic related mortality surveys in the pre-white nose syndrome era.

Wildlife Biologist – Glen Lyon Mine Internal Survey and Bat Counts- Assisted PGC with internal surveys and bat counts in the pre-white nose syndrome era.



APPENDIX I- SITE COORDINATES

Surveyed Point Coordinates and Dates

SITE ID	LAT	LONG	SURVEY DATES AND TIME			
			NIGHT 1		NIGHT 2	
			DATE	TIME	DATE	TIME
1	38.970321	-77.179342	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
1A	38.970179	-77.179042	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
1B	38.969966	-77.179862	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
1C	38.968151	-77.179281	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
1D	38.968285	-77.180026	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
2	38.983994	-77.158877	6/17/2020-6/18/2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
3	38.985514	-77.159178	6/17/2020-6/18-2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
3A	38.990166	-77.159054	6/17/2020-6/18/2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
4	38.993044	-77.15816	7/23/2020-7/24/2020	19:36-06:51	7/24/2020-7/25/2020	19:36-06:51
5	39.018273	-77.14716	6/15/2020-6/16/2020	19:36-06:43	6/16/2020-6/17/2020	19:36-06:43
5A	39.032325	-77.142243	6/15/2020-6/16/2020	19:36-06:43	6/16/2020-6/17/2020	19:36-06:43
6	39.038186	-77.146453	6/15/2020-6/16/2020	19:36-06:43	6/16/2020-6/17/2020	19:36-06:43
6A	39.038376	-77.145258	6/15/2020-6/16/2020	19:36-06:43	6/16/2020-6/17/2020	19:36-06:43
7	39.052504	-77.153843	-		-	
8	39.052681	-77.152171	7/9/2020-7/10/2020	19:36-06:51	7/10/2020-7/11/2020	19:36-06:51
8A	39.069825	-77.158858	7/7/2020-7/8/2020	19:36-06:51	7/8/2020-7/9/2020	19:36-06:51
8B	39.100322	-77.178227	7/22/2020-7/23/2020	19:36-06:51	7/23/2020-7/24/2020	19:36-06:51
9	39.123345	-77.200785	7/25/2020-7/26/2020	19:36-06:51	7/26/2020-7/27/2020	19:36-06:51
10	39.124289	-77.199345	-		-	
11	39.032937	-77.13722	6/15/2020-6/16/2020	19:36-06:43	6/16/2020-6/17/2020	19:36-06:43
11A	39.028872	-77.117535	6/17/2020-6/18/2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
12	39.016725	-77.096923	7/6/2020-7/7/2020	19:36-06:51	7/7/2020-7/8/2020	19:36-06:51
13	39.013177	-77.09343	7/7/2020-7/8/2020	19:36-06:51	7/8/2020-7/9/2020	19:36-06:51
13A	39.011182	-77.089439	7/6/2020-7/7/2020	19:36-06:51	7/7/2020-7/8/2020	19:36-06:51
14	39.007073	-77.08496	7/7/2020-7/8/2020	19:36-06:51	7/8/2020-7/9/2020	19:36-06:51
15	39.007253	-77.079254	7/7/2020-7/8/2020	19:36-06:51	7/8/2020-7/9/2020	19:36-06:51
16	39.007327	-77.06866	7/7/2020-7/8/2020	19:36-06:51	7/8/2020-7/9/2020	19:36-06:51
17	39.011732	-77.064371	7/9/2020-7/10/2020	19:36-06:51	7/10/2020-7/11/2020	19:36-06:51
18	39.014701	-77.059262	7/9/2020-7/10/2020	19:36-06:51	7/10/2020-7/11/2020	19:36-06:51
18A	39.013546	-77.057182	7/23/2020-7/24/2020	19:36-06:51	7/24/2020-7/25/2020	19:36-06:51
19	39.015386	-77.032446	-		-	
20	39.014599	-77.031979	7/9/2020-7/10/2020	19:36-06:51	7/10/2020-7/11/2020	19:36-06:51
21- Bridge- NW Branch	39.017731	-76.994322	-		-	
22	39.017002	-76.993901	7/9/2020-7/10/2020	19:36-06:51	7/10/2020-7/11/2020	19:36-06:51
23	39.02029	-76.98296	-		-	
24	39.019475	-76.983615	7/9/2020-7/10/2020	19:36-06:51	7/10/2020-7/11/2020	19:36-06:51
24A	39.018917	-76.966916	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
24B	39.019498	-76.959311	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
25	39.02427	-76.950308	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
26	39.026704	-76.951113	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
27	39.019933	-76.948244	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
28	39.020347	-76.932842	-		-	
29	39.019375	-76.933545	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51
30	39.01182	-76.903173	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51
31	39.011227	-76.903896	-		-	
31A	39.003366	-76.89285	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51
32	38.996932	-76.875361	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
33	38.989374	-76.886312	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
34	38.982267	-76.891663	-		-	
34A	38.982588	-76.893933	6/22/2020-6/23/2020	19:36-06:43	6/23/2020-6/24/2020	19:36-06:43
34B	38.958038	-76.867089	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
34C	38.950732	-76.859956	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
34D	38.947294	-76.841284	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
34E	38.925059	-76.854271	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
35	38.889168	-76.84517	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51
35A	38.860262	-76.848691	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51
35B	38.850351	-76.860622	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51

SITE ID	LAT	LONG	SURVEY DATES AND TIME			
			NIGHT 1		NIGHT 2	
			DATE	TIME	DATE	TIME
36	38.830814	-76.872853	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
36A	38.829223	-76.876497	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
36B	38.823774	-76.884609	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
36C	38.819806	-76.895725	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
36D	38.819891	-76.916071	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
37	38.819776	-76.930791	-		-	
38	38.818029	-76.931255	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
39- Bridge-Seven Locks Road	38.983773	-77.160555	6/17/2020-6/18/2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
40- Bridge-Macarthur Blvd/Clara Barton Westbound	38.975416	-77.178263	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
X1	38.982135	-77.172286	7/15/2020-7/16/2020	19:36-06:51	7/16/2020-7/17/2020	19:36-06:51
X2	39.009289	-77.152381	7/23/2020-7/24/2020	19:36-06:51	7/24/2020-7/25/2020	19:36-06:51
X3	39.012758	-77.147143	6/17/2020-6/18/2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
X4	39.016389	-77.114379	6/17/2020-6/18/2020	19:36-06:43	6/18/2020-6/19/2020	19:36-06:43
X5	39.019171	-77.108434	7/6/2020-7/7/2020	19:36-06:51	7/7/2020-7/8/2020	19:36-06:51
X6	39.017007	-76.913091	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
X7	38.976909	-76.873268	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
X8	38.967182	-76.868858	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
X9	38.943794	-76.861428	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43
X10	38.932718	-76.855395	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
X11	38.90972	-76.850227	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
X12	38.898213	-76.848816	7/13/2020-7/14/2020	19:36-06:51	7/14/2020-7/15/2020	19:36-06:51
X13	38.875774	-76.844325	6/24/2020-6/25/2020	19:36-06:43	6/25/2020-6/26/2020	19:36-06:43
X14	38.83882	-76.869957	6/29/2020-6/30/2020	19:36-06:43	6/30/2020-7/1/2020	19:36-06:43

*All sites were surveyed for 12 hours each night