

BAMBOO BROOK
170 LONGVIEW ROAD
FAR HILLS, NJ 07931
908-234-1225
908-234-1189 (FAX)
info@njconservation.org
www.njconservation.org



September 12, 2016

VIA ELECTRONIC FILING

Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426
Attention: Kimberly D. Bose, Secretary

Re: Proposed PennEast Pipeline Project
FERC Docket No. CP15-558-000

Dear Secretary Bose:

I submit the following comments and data on behalf of New Jersey Conservation Foundation (NJ Conservation). We are an Intervenor in Docket Number CP15-558-000 regarding the proposed PennEast Pipeline. New Jersey Conservation Foundation (NJ Conservation) is writing to document significant deficiencies in the Draft Environmental Impact Statement (DEIS) regarding data concerning, and potential impacts to, federal and state wildlife and plant species of special concern.

Over the period of one year, NJ Conservation undertook biological survey work with a team of respected experts. With a limited budget and small team, we found 39 vernal pools, 24 distinct populations of 11 special concern and endangered plant species, including 13 populations of 3 state endangered plant species, and 52 rare wildlife sightings within the 400-foot study corridor for the proposed PennEast pipeline. These include at least 7 high-quality streams with populations of the state-threatened Long-Tailed Salamander, Northern Copperhead snake (state special concern but deemed by threatened by the NJ Endangered Species Advisory Committee) in a population crossed by over 4 miles of the pipeline, and evidence of the federally-endangered Indian Bat in five locations, among others. A summary of our findings is enclosed, along with several maps showing the general locations where species were sighted.

This is just a representative sample of the species of special concern, given that we did not have the resources to survey the entire proposed route. If proper surveys were conducted along the entire route, many additional rare species and locations would be discovered. The results already reveal that the proposed route would have significant and unavoidable impacts on a host of sensitive and protected species.

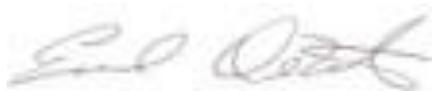
We undertook these surveys because we have little confidence in the ability of PennEast or its agents to accurately document the presence of such species based upon their track record of inaccurate and incomplete data collection and analysis in both the Resource Reports and DEIS.

In contrast, PennEast has failed to document the presence of or potential impacts to numerous species of special concern. The DEIS fails to take the required hard look at impacts required under the National Environmental Policy Act. The DEIS should be withdrawn and resubmitted for public review once it has complete information regarding impacts to plants and wildlife.

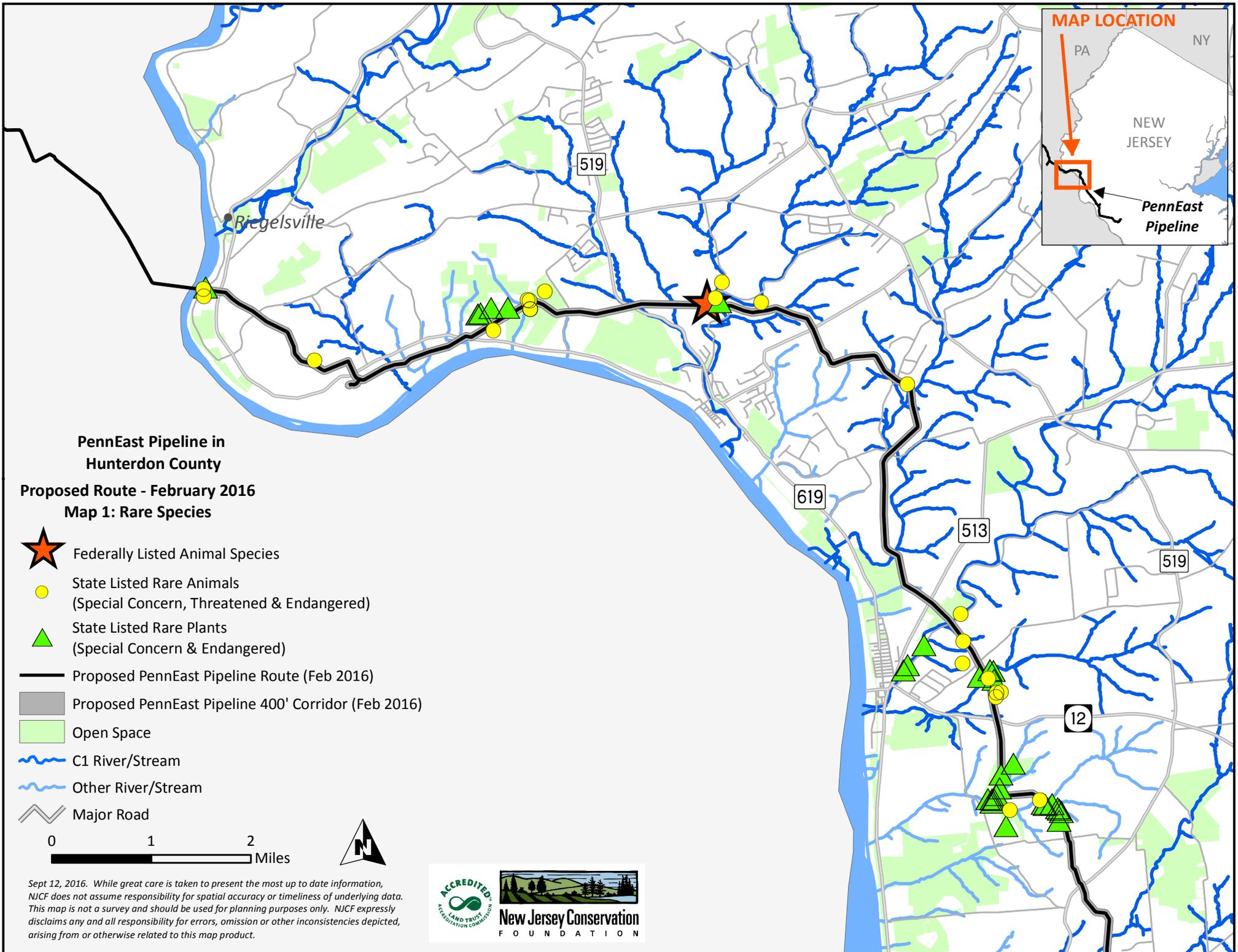
It should be noted that Natural Heritage and Rare Species report forms are being submitted regularly to the appropriate New Jersey Department of Environmental Protection (NJDEP) agencies so that the actual locations of these rare species can be added to the state's database.

Thank you for your consideration. Please contact me at 908-432-3419 with any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Emile DeVito". The signature is written in a cursive style and is positioned above the typed name and contact information.

Emile DeVito, Ph.D., Manager of Science & Stewardship
emile@njconservation.org





**PennEast Pipeline in
Hunterdon County**
Proposed Route - February 2016
Map 2: Rare Species

-  Federally Listed Animal Species
-  State Listed Rare Animals
(Special Concern, Threatened & Endangered)
-  State Listed Rare Plants
(Special Concern & Endangered)
-  Proposed PennEast Pipeline Route (Feb 2016)
-  Proposed PennEast Pipeline 400' Corridor (Feb 2016)
-  Open Space
-  C1 River/Stream
-  Other River/Stream
-  Major Road

0 1 2 Miles



Sept 9, 2016. While great care is taken to present the most up to date information, NJCF does not assume responsibility for spatial accuracy or timeliness of underlying data. This map is not a survey and should be used for planning purposes only. NJCF expressly disclaims any and all responsibility for errors, omission or other inconsistencies depicted, arising from or otherwise related to this map product.



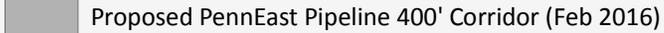
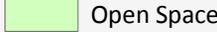
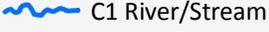
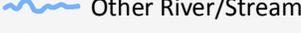
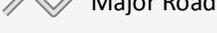
Lambertville



MAP LOCATION



**PennEast Pipeline in
Hunterdon & Mercer Counties
Proposed Route - February 2016
Map 3: Rare Species**

-  Federally Listed Animal Species
-  State Listed Rare Animals
(Special Concern, Threatened & Endangered)
-  State Listed Rare Plants
(Special Concern & Endangered)
-  Northern Copperhead Population
-  Proposed PennEast Pipeline Route (Feb 2016)
-  Proposed PennEast Pipeline 400' Corridor (Feb 2016)
-  Open Space
-  C1 River/Stream
-  Other River/Stream
-  Major Road

0 1 2 Miles



Sept 9, 2016. While great care is taken to present the most up to date information, NJCF does not assume responsibility for spatial accuracy or timeliness of underlying data. This map is not a survey and should be used for planning purposes only. NJCF expressly disclaims any and all responsibility for errors, omission or other inconsistencies depicted, arising from or otherwise related to this map product.



Lambertville

518

579

29

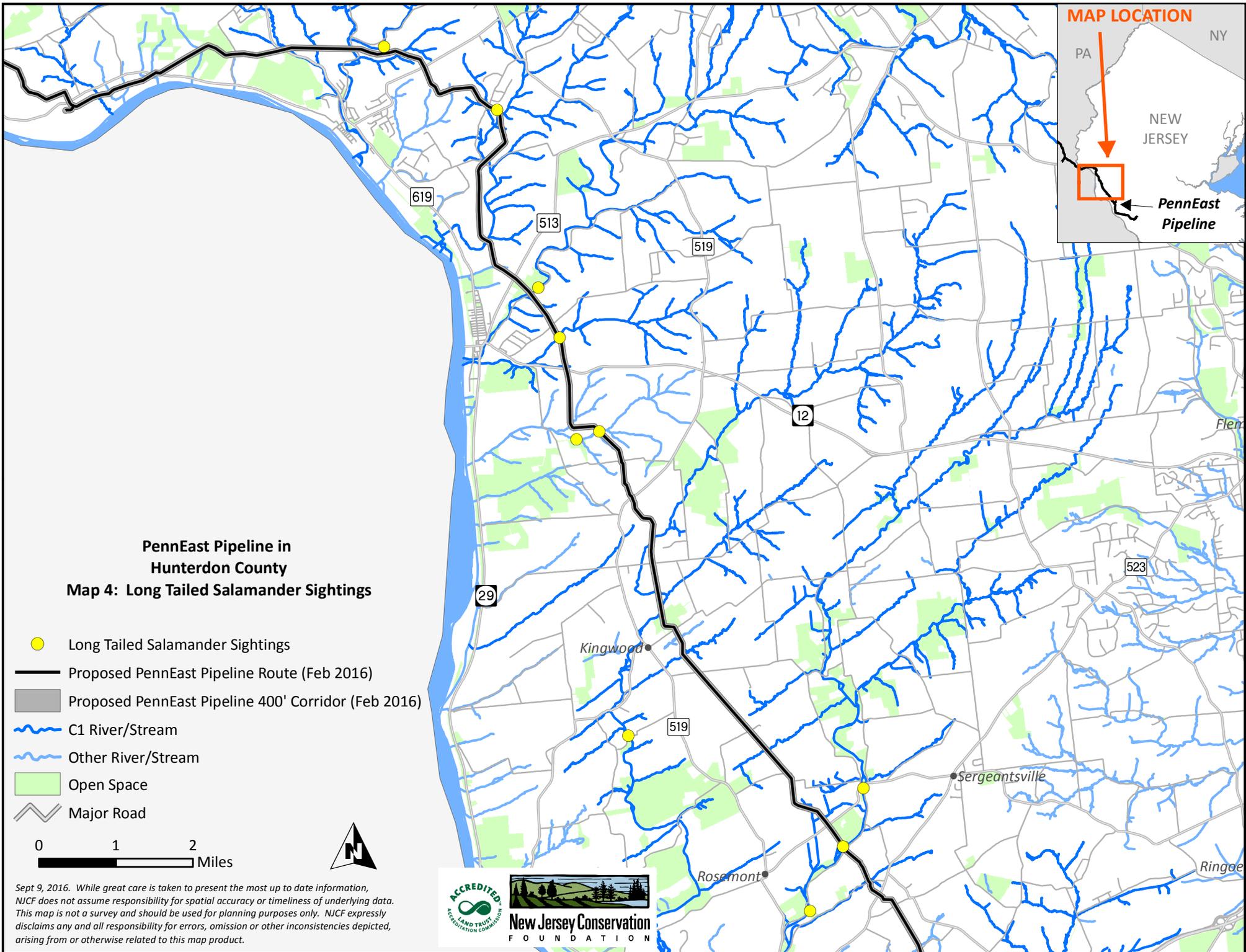
31

95

31

Harbourton

Pennington



**PennEast Pipeline in
Hunterdon County
Map 4: Long Tailed Salamander Sightings**

- Long Tailed Salamander Sightings
- Proposed PennEast Pipeline Route (Feb 2016)
- Proposed PennEast Pipeline 400' Corridor (Feb 2016)
- ~ C1 River/Stream
- ~ Other River/Stream
- Open Space
- Major Road

0 1 2
Miles



Sept 9, 2016. While great care is taken to present the most up to date information, NJCF does not assume responsibility for spatial accuracy or timeliness of underlying data. This map is not a survey and should be used for planning purposes only. NJCF expressly disclaims any and all responsibility for errors, omission or other inconsistencies depicted, arising from or otherwise related to this map product.



SUMMER BAT ACOUSTIC SURVEY

New Jersey Conservation Fund - July 2016



Acoustic Monitoring at FBRD_NORH

Bat Conservation and Management, Inc.
Carlisle, Pennsylvania

Summer Bat Acoustic Survey

Prepared by:



1263 Claremont Drive, Carlisle, PA 17015
Phone and Fax: (717) 241-2228 Cellular: (814) 442-4246
Website: www.batmanagement.com

Project Principal:

John Chenger

Bat Conservation and Management, Inc.

Surveyors, Datasheets, & Micrositing:

Blaine J. Rothausser

GZA GeoEnvironmental, Inc.

Photography by:

Blaine J. Rothausser

Report Prepared by:

John Chenger

10 September 2016

TABLE OF CONTENTS

BACKGROUND AND OBJECTIVE 4

METHODS 5

RESULTS AND DISCUSSION..... 8

CONCLUSIONS AND RECOMMENDATIONS 13

ATTACHMENT A 15

AUTOMATED CLASSIFIER RESULTS..... 15

ATTACHMENT B 18

ACOUSTIC SURVEY LOCATIONS..... 18

ATTACHMENT C..... 65

LUSO example from ALAU_CRK2 65

LUSO example from Site: JVRD_CREK..... 66

LUSO example from Site: LWCR_CREK..... 67

LUSO example from Site: RHPD_POND..... 68

LUSO example from Site: SFRD_POND..... 69

Background and Objective

The work to be accomplished consists of providing all technical expertise, labor, equipment, and supervision required for acoustic monitoring for bats at sites designated by New Jersey Conservation Foundation (NJCF). The federally endangered Indiana bat (*Myotis sodalis*) (IBAT) and northern long-eared bat (*Myotis septentrionalis*) (NLEB) was recently listed as federally threatened with an associated interim 4(d) rule (April 2, 2015) both are known to occur in New Jersey. Other regional bat species are also declining and are of secondary interest to this survey.

This effort will focus on determining the presence/absence of *Myotis*, particularly IBAT and NLEB, on sites designated by NJCF during the summer maternity season when pregnant/lactating females and their pups are most vulnerable. This survey will aid in designing best management practices and conservation measures for work conducted on NJCF property nearby the sampling sites.

The Indiana bat was listed as endangered in 1967 due to episodes of people disturbing hibernating bats in caves during winter, resulting in the death of large numbers of bats. Indiana bats are vulnerable to disturbance because they hibernate in large numbers in only a few caves (the largest hibernation caves support from 20,000 to 50,000 bats). Other threats that have contributed to the Indiana bat's decline include commercialization of caves, loss of summer habitat, pesticides and other contaminants, and most recently, the disease white-nose syndrome. Summering Indiana bats roost in trees in riparian, bottomland, and upland forests from approximately April 1 to October 15. Indiana bats may summer in a wide range of habitats, from highly altered landscapes to intact forests. Roost trees are typically found in patches of forests of varying size and shape, but have also been found in pastures, fence rows, and residential yards. In addition, they have been documented in various artificial roosts of opportunity including bridges, buildings, bat houses, artificial bark, and bat condos.

Male Indiana bats are dispersed throughout the range in the summer, roosting individually or in small groups, but may favor areas near hibernaculum. In contrast, reproductive females form larger groups, referred to as maternity colonies. Female Indiana bats exhibit strong site fidelity to summer roosting and foraging areas, tending to return to the same summer range annually to bear their young. These traditional summer sites are essential to the reproductive success and persistence of local populations.

Indiana bats are known to use a wide variety of tree species for roosting, but structure (i.e., crevices or exfoliating bark) is probably most important in determining if a tree is a suitable roost site. Roost trees generally are dead, dying or live trees (e.g. shagbark hickory and oaks) with peeling or exfoliating bark which allows the bat to roost between the bark and bole of the tree, but Indiana bats will also use narrow cracks, split tree trunks and/or branches as roosting sites. Southern Michigan maternity roost trees are typically in open areas exposed to solar radiation. Roost trees vary considerably in size, but those used by Indiana bat maternity colonies usually are large relative to other trees nearby, typically greater than 9 inches dbh. Male Indiana bats have been observed roosting in trees as small as 3 inches dbh. Bats may switch roosts for predator avoidance, to reduce parasitic loads, or to take advantage of ephemeral insect and/or water resources. Therefore, roosts with high solar exposure, multiple available roosts (i.e., numerous deep crevices) and those located in close proximity to water sources and/or foraging resources are considered critical habitat for the survival of this species.

Flight behavior and echolocation styles for Indiana myotis are typical of bats that are “generalists” flying both above and beneath the canopy and both within wooded areas and along edge habitats. They visit

small to medium size streams and ponds to drink and forage. Morphologically, these bats have low wing loading and aspect ratios, making them highly maneuverable. They pursue and catch their insect prey by aerial hawking and feed predominantly on moths, true flies, and beetles. They produce frequency-modulated, broadband echolocation calls sweeping from a high of 90 kilohertz (kHz) to a low of 35 kHz (average sweeps of 81-38 kHz) that are of relatively high intensities to facilitate close-range target discrimination while in flight, including information about target size, shape and texture. Indiana bats and little brown bats (*Myotis lucifugus*) present call repertoires with substantial overlap rendering only a small portion of their repertoires with discriminating characteristics. These species require further investigation to determine whether this limited discriminating data space noted for this pair represents an artifact of a finite reference library or consistent interspecies differences and therefore cannot be reliably separated mathematically via software programs as of this writing. No test has been developed to determine the accuracy of manual vetting of unknown bat call recordings.

Indiana myotis overwinter predominantly in hibernacula consisting of caves and abandoned mines. For hibernation, they require cool, humid caves with stable temperatures, under 50° F but above freezing. Relatively few caves within the range of the species have these conditions.

Methods

Each site was monitored with a full-spectrum bat detector (Pettersson[®], Uppsala SWEDEN) for a period of at least one night and up to three nights between July 7-16, 2016. Monitoring began approximately 20 minutes after sundown each night and continued until approximately 20 minutes before sunrise the next morning. Photographs and GPS coordinates were taken at each detector deployment, as well as complete meta-data for the deployment including general location, habitat information, weather conditions during sampling, microphone height above ground and orientation, detector settings, and clutter conditions.

Acoustic surveys offer certain advantages over all other monitoring methods for this specific application. First and foremost, acoustics allow the ability to sample large areas of potential habitat that are impossible, difficult, or too time- and labor-intensive to observe visually while providing a permanent record of the bat activity, or lack thereof.

Second, acoustics do not require sampling equipment to be manned on-site, which could affect bat behavior at or near the roost site. Passive bat detectors do not generate sound or light during normal operation. Nor does the daylight placement of such passive detectors create undue noise at the potential roost site. Finally, acoustic methods also allow for greater spatiotemporal monitoring. Passive detectors can easily and efficiently monitor for multiple days, weeks, or months, throughout the entire night, each night. And, because most high-intensity 40 kHz bat echolocation call sequences can be detected from distances of 10-20 meters (Adams et al., 2012), a 300 m² site can be monitored easily by a single passive detector.

To maximize detection, acoustic deployment locations for this Project were selected along likely travel paths to and from presumed roosting and foraging resources (e.g., along linear landscape features linking potential roost sites with pooled sources of water for drinking and/or foraging). The bat detectors were placed in flight corridors with microphones oriented towards the largest volume of open air space. Each detector utilized external directional microphones that were elevated 2-5 m above ground, allowing echolocation calls to be recorded from bats traveling in line with, above, and below the microphone height; thereby, maximizing the volume of airspace covered by the monitoring devices at each site.

Because the sites where detectors were deployed contain many solid, flat surfaces with the potential to generate echoes, it is essential to raise the microphones significantly above echo-producing surfaces so that any echoes are sufficiently delayed and do not interfere with the original echolocation call pulse. Therefore, interloping species may be recorded during acoustic surveys, but if a species of interest is also traveling through the area, bat detectors will have the best chance of recording dis-ambiguous call sequences to confirm species of interest occupancy.

Eliminating any form of interference from recordings is essential to the collection of high-quality echolocation sequences and subsequently for confident species classification. Most northeastern myotis species produce echolocation calls with durations between 2-8 milliseconds (ms) or 0.002-0.008 seconds and inter-pulse intervals (IPIs) of between 30-130 milliseconds (0.03 and 0.13 seconds), so any echo must be delayed by at least 0.01 seconds so as not to interfere with the original call pulse, but to reside harmlessly in the IPI portion of the recording instead. This allows the recording of a higher quality echolocation call sequence that is capable of being classified more confidently to the species level. Additionally, because sound travels through air at approximately 330 meters per second, a desired delay of 0.01 seconds requires that a microphone be elevated at least 3.3 m above the echo-producing surface. Whenever possible, detector microphones placed less than 3.3 m high during this survey were located in areas with vegetative cover (e.g., grasses, shrubbery, moss, or leaves), which does not generate echoes along the edges of RHF's. All acoustic survey locations are described in **Attachment B**.

Digital recordings collected during the acoustic survey period were stored to on-board Compact-Flash memory cards. Recordings were off-loaded and attributed with the detector location, survey meta-data, and date, and also time-stamped with the actual time of the incoming bat call using the SonoBat™ D500x File Attributor utility (Arcata, California). Recordings were automatically filtered to eliminate noise files and non-bat high-frequency sound files using the SonoBat™ Batch Scrubber utility. After all recordings were post-processed in this manner, they were automatically assessed using two call analysis software programs; the SonoBat™ 4.1.0 signal analysis software, with the SonoBat Northeast species classifier, and Kaleidoscope Pro 3.1.8 with the North America Bats 3.1.0 classifier.

During the auto-classification process, the SonoBat software assigned a quality rating to each call pulse in a recording and used the 16 highest quality calls within the call sequence to determine a "species classification" decision for each call pulse in the sequence, and then tallied each species decision to determine a "sequence" classification, assigning a "discriminate probability" (DP) for the sequence classification. When both the "by vote" and "sequence" decisions match and the DP is ≥ 0.90 , the classification can be considered to be highly confident. But, because field recordings are imperfect and many bat species calls may contain considerable overlap, not all recordings can be confidently classified to the species level or to a species group during typical passive recording attempts. If a classification is rendered on a call sequence where < 5 calls in the sequence were considered and/or where a DP < 0.90 was calculated, the classification will not be accepted during manual vetting and the call file will be labeled as a high frequency species, low frequency species, ambiguous species guild, or unknown species. "High frequency" (HF) or "low frequency" (LF) labels are applied when the characteristic frequency (i.e., F_c , or the lowest slope of the echolocation call) is above or below approximately 35 kHz respectively. High-frequency species from the northeastern bat diversity assemblage include all myotis species, plus eastern red bats (*Lasiurus borealis*) and tri-colored bats (*Perimyotis subflavus*). For most HF classifications, these two non-myotis species can be distinguished manually from myotis call sequences. Species-guild labels and/or "unknown" classifications are applied to recordings when the software failed to measure parameters on a call, yet a manual review found a bat echolocation call to be present in attempts to arrive at consistent metrics for assessing overall bat activity among sites surveyed.

A subset of all recordings that received computer-generated classifications, were also manually reviewed. This allowed verification of the computer-generated classification, and to confirm species occupancy at each sampling station. This sub-set included all recordings with a consensus decision for any myotis species (e.g., *Myotis leibii*, *M. lucifugus*, *M. septentrionalis*, or *M. sodalis*). Also, it included all recordings with a consensus decision for an ambiguous *Myotis lucifugus/Myotis sodalis* classification (identified as "LuSo" by the software). Additionally, because several recordings received a "Cora" classification (for *Corynorhinus rafinesquii* (Rafinesque's big-eared bat), a species not known from the area) these recordings also were given manual attention to resolve this often-spurious result when approach-phase or acquisition-phase behaviors are recorded for certain myotis or LF species. Therefore the classifications also included "behavior" type assignments to differentiate between typical "search phase" type calls (commuting calls), which are more likely to contain species-specific characteristics for dis-ambiguous classification, and acquisition phase (approach phase or feeding buzz) type calls, which are less-species specific. Sequences were also reviewed to identify any directives or "social calls", which can be diagnostic when assigning confidence levels to species identification. Examples of spectrograms from confidently-identified myotis species are provided in **Attachment C**.

Classifications can also return spurious results especially in the case when multiple bats are recorded in a single call file. If more than one bat is determined to be present in a single recording, the file will be split and labeled "a" and "b" (and "c," if necessary) and each bat present will be verified to the species level, species group, or HF/LF, using the auto classifier and/or manual vetting as warranted. Unfortunately, most bats in the myotis genus can produce many call sequences that contain considerable overlap, which are difficult to disambiguate. Occasionally, ambiguous myotis recordings can be split into the following guilds: 40KMYO (ambiguous *Myotis leibii*, *Myotis lucifugus*, *Myotis sodalis*), LU/SO (ambiguous *Myotis lucifugus* and *Myotis sodalis*), and MYOSEP (*Myotis septentrionalis*).

Because of the high degree of variability among echolocation call repertoires for each bat species and the effects that behavior and/or presence with con-specifics or hetero-specifics have on echolocation style, the value of manually vetting automated acoustic results cannot be under-estimated. So, results of the manual classifications are therefore considered to be the most highly-confident species and/or species-guild determinations for the acoustic survey. Moreover, despite the apparent uncertainty of identifying confident recordings, sites that return no to very few myotis recordings of any species, ambiguous or not, provide ample evidence that the site is not being heavily used by MYLE. And, by extension, the absence of myotis recordings in general indicates absence of MYSO or MYSE activity at a site. For these reasons, all discussion, conclusions, and recommendations are based on the sub-set of manually vetted recordings collected during this survey.

Results and Discussion

Acoustic survey - Acoustic recordings collected from monitoring efforts at the 20 sites during the survey were identified to species using the automatic classifier available in the SonoBat™ 4.1 Northeast software (Arcata, California) and Kaleidoscope 3.1.8 (Concord, MA) and then manually vetted (using the quantitative and qualitative metrics described above) by John Chenger (BCM) to confirm (or reject) the computer classifications of all myotis species and any transient species of interest (e.g., *Corynorhinus rafinesquii*), to assign bat behaviors (e.g., approach-phase calls, feeding buzzes, or social calls), and to determine if more than one bat and/or species was present in the recording.

Unlike capture surveys, results from acoustic surveys indicate *indices* of bat activity, not *absolute numbers of individuals* present on the landscape. For example, if results report 78 “bat passes” from a myotis species, it does not mean that there were 78 individual bats echolocating over the microphones. There could have been a single bat, making 78 passes throughout the night, or 78 individuals each making a single pass, or anything in between. But when results are compared from site to site at a parcel, or from night to night, or between parcels, relative activities can be determined, especially when total monitoring time is consistent between sites, or accounted for with an appropriate multiplier. Moreover, acoustic surveys are biased towards bats that are easy to record (usually louder, lower-frequency bats) and easy to identify (bats with dis-ambiguous call characteristics). Nevertheless, acoustics provide an efficient survey tool for assessing broad areas of habitat, as in this survey. This is especially true when surveying for bat species that often switch roosts and therefore is may be important to document “activity areas” across a landscape, which can best be done with acoustics.

Therefore, when analyzing data from this survey, the sites with no conclusive Myotis species acoustic activity should be considered as unlikely high-priority Myotis habitat and therefore could be dropped from additional physical capture assessments for the species. Sites that do contain confidently identified Myotis-class activity can be recommended for future evaluation, including physical capture surveys to confidently document species that are otherwise acoustically ambiguous.

During this acoustic survey, 3,910 recordings containing bat calls were collected from the 20 sites. The two software tools confidently classified up to ten (10) species of northeastern bats. These recordings were then manually scrutinized to verify presence of each species at each site, with particular attention to any files belonging to myotis species or Myotis guilds. After manual vetting, BCM could confirm one (1) Myotis species guild (LUSO) is definitely present at 5 of the 20 sites sampled. The LUSO guild represents either *M. sodalis* or *M. lucifugus*, because their call repertoires contain substantial overlap rendering only a small portion of their repertoires with discriminating characteristics and may not be mathematically separable with current technology. **Table 1** provides a summary of the above-referenced acoustic survey results.

This said, results of the acoustic inventory indicated that for the vast majority of the Project survey area Myotis species were not abundant, comprising only 7% (SonoBat) to 13% (KaPRO) of the total recordings. Of particular note, the vast majority of Myotis-type recordings were obtained from Site SFRD_POND, where 70% of the bat activity was attributed to myotis species. The majority of these recordings were classified as belonging to the collectively ambiguous MYLU, MYSO, or LUSO guild, which could indicate significant MYSO activity at this site during the time of this survey. The sites where recordings were made containing Myotis-class recordings that were manually verified by BCM are ALAU_CRK2, JVRD_CREK, LWCR_CREK, RHPD_POND, and SFRD_POND.

Both software programs used (SonoBat and Kaleidoscope Pro) will calculate an estimated likelihood of

presence for each species known to the classifier based on the number of classified species and their known overlap and ambiguity of classification. The likelihood estimate provides a probabilistic estimate and does not convey certainty. Species MLE calculations reported for null hypothesis of absence, i.e., 0 infers probability of presence, 1 infers probability of absence. In many cases manual vetting of recordings by knowledgeable users may enable species presence confirmation from single files having distinctive characteristics, despite a low calculated likelihood. Large data sets will numerically favor a probabilistic outcome of likelihood for some undeserving species. The probabilistic calculation performs best with single night, single site data sets. Maximum likelihood estimates (MLE) of species presence as generated from the two software programs, SonoBat and Kaleidoscope, are provided in **Attachment A**, and also summarized in **Table 1**.

Table 1. Early July 2016 summary of bat presence based on maximum likelihood estimates of acoustic recordings using Kaleidoscope 3.1.8 and Sonobat 4.1.

Site Code	Latitude/ Longitude (WSG84)	KaPRO MLE Presence	KaPRO Actual Files Classified	SonoBat MLE Presence	SonoBat Actual Files Classified	BCM Manual Confirmation Review
ALAU CRK1	40°23'35.79" N 74°56'17.61" W	EPFU LABO	EPFU - 14 LABO - 4 LANO - 4 MYLU - 1	EPFU	EPFU - 8 LABO - 1 LACI - 1	EPFU EPFU/LANO LABO
ALAU CRK2	40°23'35.79" N 74°56'17.61" W	EPFU LABO MYLU MYSO	EPFU - 178 LABO - 12 LACI - 2 LANO - 22 MYLU - 9 MYSO - 10	EPFU LACI LANO (possible) MYLU (possible) MYSO	EPFU - 145 LABO - 2 LACI - 16 LANO - 4 MYLU - 7 PESU - 1	EPFU EPFU/LANO LACI LABO LUSO* PESU
BLBF ROW1	40° 34' 41.78" N 75° 08' 21.82" W	EPFU LABO	EPFU - 210 LABO - 3 LANO - 22	EPFU LANO (possible)	EPFU - 137 LABO - 1 LACI - 1 LANO - 23	EPFU EPFU/LANO LABO
BLBF ROW2	40° 34' 42.23" N 75° 08' 22.05" W	EPFU LABO LANO	EPFU - 355 LABO - 23 LACI - 2 LANO - 88 MYLU - 1 NYHU - 2	EPFU LABO LACI (possible) LANO	CORA - 1 EPFU - 283 LABO - 17 LACI - 3 LANO - 45 NYHU - 2	EPFU EPFU/LANO LABO LACI LANO NYHU
BLBF ROW3	40° 34' 42.16" N 75° 08' 19.99" W	EPFU LABO MYSO (possible)	EPFU - 333 LABO - 69 LACI - 3 LANO - 21 MYSO - 1 NYHU - 6	EPFU LABO LACI (possible) LANO (possible)	EPFU - 257 LABO - 38 LACI - 3 LANO - 27 NYHU - 1	EPFU EPFU/LANO LABO LACI LANO
BLBF ROW4	40° 34' 42.75" N 75° 08' 20.43" W	EPFU LABO	EPFU - 146 LABO - 8 LACI - 2 LANO - 8	EPFU LABO (possible)	EPFU - 102 LABO - 5 LACI - 4 LANO - 11 PESU - 1	EPFU EPFU/LANO LABO LACI LANO
BLVL POND	40° 24' 49.05" N 74° 57' 8.157" W	EPFU	EPFU - 3	n/a	EPFU - 2 LANO - 1	EPFU EPFU/LANO

Site Code	Latitude/ Longitude (WSG84)	KaPRO MLE Presence	KaPRO Actual Files Classified	SonoBat MLE Presence	SonoBat Actual Files Classified	BCM Manual Confirmation Review
CPCR NORH	40° 30' 41.50" N 75° 20' 20.67" W	EPFU LABO	EPFU - 38 LABO - 8 LANO - 6	EPFU LABO (possible)	EPFU - 32 LABO - 5 LANO - 5	EPFU EPFU/LANO LABO LANO
CPCR SOUH	40° 30' 41.40" W 75° 20' 20.52" N	EPFU LABO	EPFU - 35 LABO - 4 LANO - 5	EPFU LABO (possible)	EPFU - 29 LABO - 2 LANO - 4	EPFU EPFU/LANO
FBRD NORH	40° 28' 05.60" N 75° 00' 39.10" W	EPFU LABO	EPFU - 413 LABO - 8 LACI - 1 LANO - 5 MYLU - 1	EPFU LABO (possible)	EPFU - 467 LABO - 4 LACI - 1 LANO - 0	EPFU
HSFR CREK	40° 34' 15.00" N 75° 03' 18.37" W	EPFU	EPFU - 10 LANO - 2	EPFU	EPFU - 8 LANO - 1	EPFU EPFU/LANO
JVRD CREK	40° 34' 59.55" N 75° 05' 39.25" W	EPFU MYLU	EPFU - 8 MYLU - 8	EPFU MYLU (possible)	EPFU - 8 LUSO - 2 MYLU - 5	EPFU LUSO
LWCR CREK	40° 25' 56.96" N 74° 58' 13.47" W	EPFU MYLU MYSO	EPFU - 56 LABO - 2 LACI - 1 LANO - 3 MYLU - 12 MYSO - 9	EPFU MYLU (possible)	EPFU - 55 LABO - 1 LUSO - 4 MYLU - 9 PESU - 1	EPFU LABO LUSO PESU
PLVR CRK1	40° 20' 08.65" N 74° 53' 54.88" W	EPFU LANO	EPFU - 10 LANO - 7	EPFU LANO (possible)	EPFU - 6 LANO - 4	EPFU/LANO
PLVR CRK2	40° 20' 10.74" N 74° 53' 54.33" W	EPFU LABO LACI LANO	EPFU - 88 LABO - 6 LACI - 22 LANO - 89 NYHU - 1	EPFU LABO (possible) LACI LANO	EPFU - 54 LABO - 4 LACI - 27 LANO - 26	EPFU EPFU/LANO LACI LANO
PLVR ROW1	40° 20' 05.12" N 74° 53' 48.73" W	EPFU LABO	EPFU - 28 LABO - 4	EPFU	EPFU - 30	EPFU LABO LABO/NYHU

Site Code	Latitude/ Longitude (WSG84)	KaPRO MLE Presence	KaPRO Actual Files Classified	SonoBat MLE Presence	SonoBat Actual Files Classified	BCM Manual Confirmation Review
PLVR ROW2	40° 20'04.59" N 74° 53'47.17" W	EPFU LABO MYLU (possible)	EPFU - 30 LABO - 4 MYLU - 1	EPFU	EPFU - 38 LABO - 1	EPFU LABO
RHPD POND	40° 23' 40.83" N 74° 56'35.86" W	EPFU LABO LACI MYLU MYSO (possible) PESU	EPFU - 118 LABO - 4 LACI - 10 LANO - 26 MYLU - 25 MYSO - 3 PESU - 6	EPFU LACI LANO (possible) MYLU (possible) PESU	EPFU - 97 LABO - 1 LACI - 14 LANO - 16 LUSO - 4 NYHU - 1 MYLU - 2 MYSO - 1 PESU - 6	EPFU EPFU/LANO LACI LUSO PESU
SFRD POND	40° 27' 47.35" N 74° 59' 15.35" W	EPFU LACI MYLU MYSO	EPFU - 97 LABO - 9 LACI - 10 LANO - 25 MYLU - 367 MYSE - 1 MYSO - 61	EPFU LACI LANO MYLU	EPFU - 59 LABO - 1 LACI - 30 LANO - 25 LUSO - 35 MYLU - 188	EPFU LACI LABO LUSO
WRMN POND	40° 25' 32.12" N 74° 57' 52.18" W	EPFU LABO	EPFU - 242 LABO - 12 LACI - 2 LANO - 45 NYHU - 1	EPFU LABO LACI (possible) LANO (possible)	CORA - 1 EPFU - 178 LABO - 6 LACI - 8 LANO - 27	EPFU EPFU/LANO LABO

Abbreviations used in this table: **40KM**=40 kHz *Myotis species*; ambiguous between several *Myotis species*; **CORA**=*Corynorhinus rafinesquii*; **EPFU**=*Eptesicus fuscus*; **LABO**=*Lasiurus borealis*; **LACI**=*Lasiurus cinereus*; **LANO**=*Lasionycteris noctivagans*; **LUSO**=ambiguous *Myotis lucifugus/Myotis sodalis*; **MYLE**=*Myotis leibii*; **MYLU**=*Myotis lucifugus*; **MYSE**=*Myotis septentrionalis*; **MYSO**=*Myotis sodalis*; **NYCH**=*Nycticeius humeralis*; **PESU**=*Perimyotis subflavus*.

Conclusions and Recommendations

This inventory was intended only to detect areas of high *Myotis* mid-summer use. Five sites contained evidence of significant *Myotis* activity during the acoustic survey: ALAU_CRK2, JVRD_CREK, LWCR_CREK, RHPD_POND, and SFRD_POND. Recordings at these sites were manually reviewed to ensure the accuracy of the automated classification and confirm presence. Site SFRD_POND contained the most recordings of the species guild of interest, where up to 70% of the bat activity at that site can be attributed to *Myotis* species, likely either the *Myotis sodalis*, *Myotis lucifugus*, or both. Overall, the project area is dominated by *Eptesicus fuscus*. The next most common species is the *Myotis sodalis/lucifugus* guild, *Lasionycteris noctivagans*, and *Lasiurus borealis*. Smaller numbers of *Lasiurus cinereus*, *Perimyotis subflavus*, and possibly *Nycticeius humeralis* are present in the project area. Absent are *Myotis leibii*, *Myotis septentrionalis*, and *Corynorhinus rafinesquii*. At the overall project level, the automated classifiers report the following species breakdown:

3,910 Recordings total	SonoBat 4.1	Kaleidoscope 3.1.8	BCM Verified
CORA	0.05%	0%	Not present
EPFU	51.0%	62%	Present
LABO	2.3%	4.6%	Present
LACI	2.8%	1.4%	Present
LANO	5.6%	9.7%	Present
LUSO	1.2%	n/a	Present
MYLE	0%	0%	Not present
MYLU	5.4%	11.0%	Possible
MYSE	0%	0.03%	Not present
MYSO	0%	2.1%	Possible
NYHU	0.1%	0.3%	Present
PESU	0.2%	0.2%	Present
Unidentified*	31%	9.1%	--

* Unidentified means the software did not attempt to force a classification when the sound recordings did not meet certain developer-specific quality control tests.

Results of the site-by-site species activity are summarized in **Table 1** and examples of the spectrographs collected for these species appear in **Attachment C**. Digital copies of the corresponding .WAV audio files for these spectrographs are available from BCM upon request.

The results of these surveys suggest there is low summer occupancy of myotis species in general within the Project study area, occurring at 5 (20%) of the 20 sites sampled. The survey was conducted at most sites for only one night, with a maximum of three nights at some sites. This abbreviated survey length dilutes the confidence that any subsequent single, one-night survey in any given location is likely to detect a species of interest. Typically 5-10 nights of survey may be required before encountering 90% of the species in an area. For a species of interest such as the federally endangered Indiana bat, limitations of current acoustic monitoring technology can only tell us that either the *Myotis sodalis* and/or *Myotis lucifugus* is present in the results above. Therefore, if further refinement of the species level classification is desired, a qualified biologist should conduct physical capture surveys in the areas of concern at the appropriate time of year, with an appropriate

level of effort coupled with additional simultaneous acoustic monitoring, and be prepared to photo document all bat captures.

ATTACHMENT A

Automated Classifier Results

Kaleidoscope 3.1.8 maximum likelihood of presence estimate, as generated by the developer's reference data when compared to the field data. Results closer to 0, highlighted in dark green, suggest presence of that species in the dataset. As of this writing, this software is one of three recommended by the US Fish and Wildlife Service to establish presence of the federally endangered Indiana bat (*Myotis sodalis*).

	B	C	D	E	F	G	H	I	J	K	L	N	O	R	S	T	U	V	W	X	Y	Z	AA
1	KALEIDOSCOPE 3.1.8	Bats of North America 3.1.0 S/A:-1											Presence P-Values:										
2		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	MYSO	NYHU	PESU	NOID	NOISE	EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	MYSO	NYHU	PESU
3	*	2412	180	55	378		427	1	84	11	6	2	354	0.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00
4	ALAU_CRK1	14	4		4		1						0	2	0.00	0.00	1.00	0.84	1.00	0.61	1.00	1.00	1.00
5	ALAU_CRK2	178	12	2	22		9		10				0	23	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00
6	BLBF_ROW1	210	3		22								0	19	0.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	BLBF_ROW2	355	23	2	88		1			2			0	37	0.00	0.00	1.00	0.25	1.00	1.00	1.00	1.00	1.00
8	BLBF_ROW3	333	69	3	21				1	6			0	15	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.33	1.00
9	BLBF_ROW4	146	8	2	8								0	13	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	BLVL_POND	3											0	0	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	CPCR_NORH	38	8		6					1			0	7	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	CPCR_SOUH	35	4		5								0	5	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	FBRD_NORH	413	8	1	5		1						1	87	0.00	0.00	1.00	1.00	1.00	0.94	1.00	1.00	1.00
14	HSFR_CREK	10			2								0	4	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15	JVRD_CREK	8					8						0	10	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
16	LWCR_CREK	56	2	1	3		12		9				0	3	0.00	0.75	0.97	1.00	1.00	0.00	1.00	0.00	1.00
17	PLVR_CRK1	10			7								0	3	0.00	1.00	1.00	0.06	1.00	1.00	1.00	1.00	1.00
18	PLVR_CRK2	88	6	22	89					1			0	12	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
19	PLVR_ROW1	28	4										0	7	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	PLVR_ROW2	30	4				1						0	13	0.00	0.00	1.00	1.00	1.00	0.61	1.00	1.00	1.00
21	RHPD_POND	118	4	10	26		27		3		6		1	20	0.00	0.85	0.00	1.00	1.00	0.00	1.00	0.51	1.00
22	SFRD_POND	97	9	10	25		367	1	61				0	40	0.00	1.00	0.00	0.91	1.00	0.00	1.00	0.00	1.00
23	WRMN_POND	242	12	2	45					1			0	34	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

SonoBat 4.1 maximum likelihood of presence estimate, as generated by the developer’s reference data when compared to the field data. Results closer to 0, highlighted in dark green, suggest presence of that species in the dataset. As of this writing, the US Fish and Wildlife Service has not officially approved this program for sole use for Indiana bat surveys due to the agency lacking enough full spectrum data which to conduct tests., despite being in development for 20+ years and a worldwide user base. Regardless, it represents the only North America bat call auto classifier able to fully take advantage of full spectrum sound data recorded in this project, and provides an additional tool for locating potential species of interest in large datasets.

	A	B	C	D	E	G	H	I	J	K	L	M	N	O	P	Q	S	T	U	V	W	X	Y	Z	AA	AB	AC	
1	Site	Date	HIF p	LoF pa	total p	Myle	Myse	Myso	Mylu	Pesu	Nyhu	Labo	Epfu	Lano	Cora	Laci	#Myle	#Myse	#Myso	#Mylu	#Pesu	#Nyhu	#Labo	#Epfu	#Lano	#Cora	#Laci	
2	PAS_NJCF16_ALAU_CRK1	20160710	6	21	27	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.08	1.00	1.00	0.68	0	0	0	0	0	0	0	1	8	0	0	1
3																												
4	PAS_NJCF16_ALAU_CRK1	all nights	6	21	27	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.08	1.00	1.00	0.68	0	0	0	0	0	0	0	1	8	0	0	1
5																												
6																												
7	PAS_NJCF16_ALAU_CRK2	20160710	36	227	263	1.00	1.00	1.00	0.41	0.82	1.00	0.73	0.00	0.31	1.00	0.02	0	0	0	7	1	0	2	145	4	0	16	
8																												
9	PAS_NJCF16_ALAU_CRK2	all nights	36	227	263	1.00	1.00	1.00	0.41	0.82	1.00	0.73	0.00	0.31	1.00	0.02	0	0	0	7	1	0	2	145	4	0	16	
10																												
11																												
12	PAS_NJCF16_BLBF_ROW1	20160711	6	110	116	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.00	0.64	1.00	0.68	0	0	0	0	0	0	0	1	67	9	0	1
13	PAS_NJCF16_BLBF_ROW1	20160712	2	82	84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.54	1.00	1.00	0	0	0	0	0	0	0	0	52	2	0	0
14	PAS_NJCF16_BLBF_ROW1	20160713	1	52	53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.01	0.10	1.00	1.00	0	0	0	0	0	0	0	0	18	12	0	0
15																												
16	PAS_NJCF16_BLBF_ROW1	all nights	9	244	253	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.00	0.21	1.00	0.68	0	0	0	0	0	0	0	1	137	23	0	1
17																												
18																												
19	PAS_NJCF16_BLBF_ROW2	20160712	33	205	238	1.00	1.00	1.00	1.00	1.00	1.00	0.08	0.00	0.13	1.00	0.68	0	0	0	0	0	0	0	8	124	24	0	1
20	PAS_NJCF16_BLBF_ROW2	20160713	10	169	179	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.45	1.00	1.00	0	0	0	0	0	0	0	0	98	14	0	0
21	PAS_NJCF16_BLBF_ROW2	20160714	19	101	120	1.00	1.00	1.00	1.00	1.00	1.00	0.84	0.09	0.00	0.81	0.63	0.37	0	0	0	0	0	2	9	61	7	1	2
22																												
23	PAS_NJCF16_BLBF_ROW2	all nights	62	475	537	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.01	0.00	0.05	0.77	0.37	0	0	0	0	0	2	17	283	45	1	3
24																												
25																												
26	PAS_NJCF16_BLBF_ROW3	20160712	57	91	148	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.00	0.00	0.90	1.00	0.68	0	0	0	0	0	1	30	63	6	0	1
27	PAS_NJCF16_BLBF_ROW3	20160713	5	79	84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.00	0.31	1.00	0.68	0	0	0	0	0	0	1	50	3	0	1
28	PAS_NJCF16_BLBF_ROW3	20160714	33	210	243	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.11	0.00	0.46	1.00	0.68	0	0	0	0	0	0	7	144	18	0	1
29																												
30	PAS_NJCF16_BLBF_ROW3	all nights	95	380	475	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.00	0.00	0.44	1.00	0.37	0	0	0	0	0	1	38	257	27	0	3
31																												
32																												
33	PAS_NJCF16_BLBF_ROW4	20160712	7	94	101	1.00	1.00	1.00	1.00	1.00	1.00	0.39	0.00	0.31	1.00	0.37	0	0	0	0	0	0	0	3	65	4	0	2
34	PAS_NJCF16_BLBF_ROW4	20160714	8	75	83	1.00	1.00	1.00	1.00	0.82	1.00	0.73	0.00	0.62	1.00	0.86	0	0	0	0	1	0	2	37	7	0	2	
35																												
36	PAS_NJCF16_BLBF_ROW4	all nights	15	169	184	1.00	1.00	1.00	1.00	0.82	1.00	0.29	0.00	0.78	1.00	0.90	0	0	0	0	1	0	5	102	11	0	4	
37																												
38																												
39	PAS_NJCF16_BLVL_POND	20160708	0	3	3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75	0.77	1.00	1.00	0	0	0	0	0	0	0	0	2	1	0	0
40																												
41	PAS_NJCF16_BLVL_POND	all nights	0	3	3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75	0.77	1.00	1.00	0	0	0	0	0	0	0	0	2	1	0	0
42																												
43																												
44	PAS_NJCF16_CPCR_NORH	20160707	12	50	62	1.00	1.00	1.00	1.00	1.00	1.00	0.21	0.00	0.71	1.00	1.00	0	0	0	0	0	0	0	5	32	5	0	0
45																												
46	PAS_NJCF16_CPCR_NORH	all nights	12	50	62	1.00	1.00	1.00	1.00	1.00	1.00	0.21	0.00	0.71	1.00	1.00	0	0	0	0	0	0	0	5	32	5	0	0
47																												
48																												
49	PAS_NJCF16_CPCR_SOUH	20160707	7	44	51	1.00	1.00	1.00	1.00	1.00	1.00	0.53	0.00	0.82	1.00	1.00	0	0	0	0	0	0	0	2	29	4	0	0
50																												
51	PAS_NJCF16_CPCR_SOUH	all nights	7	44	51	1.00	1.00	1.00	1.00	1.00	1.00	0.53	0.00	0.82	1.00	1.00	0	0	0	0	0	0	0	2	29	4	0	0
52																												

Continues on next page...

Attachment B

Acoustic Survey Locations

Date	07/06/2016
Site Name/Location	ALAU2 Alexaukin Creek- Geri's Farm
Lat/Long	40°23'35.79" N 74°56'17.61" W 99' elevation
Weather Conditions Set up	Sunny, hot, humid, partially cloudy. Temp: 83°
Mic Facing Direction	10% below horizontal, mic elevation of: 12 ft Facing 60°
Temp. Set Temp. Rise Survey Conditions	83° 73° Clear / No Rain Humidity +/-53%
Total Hours Operated	9 hours
Files Recorded	26 files recorded
Settings	Gain = 40 , Trig = 160 Interval = 0



Acoustic Site Description:

The site is set up over Alex Aukin Creek, which is about 35ft wide, and 6in average depth. It is slow moving and has a low base flow. River has abundant rock algae. The surrounding forest is a closed forest edge. Rocks on site are sedimentary fluvial deposits - mostly shales and mudstones.

80% open

Flora observed around creek:

Russian olive
Wild Carrot
Sycamore
Barberry
White snakeroot
Poison Ivy
Reed grass
Japanese Hops
Polygonums
Clearweed

Forested Edges

95% closed canopy



Aerial Location Map:

Cannot find exact location on google maps



Fauna Observed during Site Visits

Dragonflies	Herptiles	Butterflies
Widow Skimmer	Green Frog	Appalachian Eyed Brown
Powdered Dancer		Cabbage White
Ebony Jewel Wing		Eastern Swallowtail
Slaty Skimmer		
Common White tail		
Birds		
Red-eyed vireo		
Yellow Warbler		
Titmice		
House Sparrow		
Cardinal		
Blue Jay		
Common yellow throat		

Date	07/06/2016
Site Name/Location	BRHL Brookville Hollow Road, Delaware Township
Lat/Long	40° 24' 49.05"N 74° 57' 8.157"W
Weather Conditions Set up	Sunny but partially cloudy, hot and humid
Mic Facing Direction	Facing N-NE horizontal Mic Elevation of : 8ft horn attached
Temp. Set	84°
Temp. Rise	76°
Survey Conditions	Clear / No Rain Humidity +/-53%
Site Elevation	271 ft. elevation
Total Hours Operated	9 hours
Files Recorded	0 files recorded
Settings	Gain = 40 , Trig = 160 Interval = 0



Acoustic Site Description:

The site is in an open meadow. The unit is set up over slow moving stream which has a rocky bottom. The stream is about 3ft wide and 4 inches in depth. It is stilt grass dominated with cat sod lawn areas extensive. There are sporadic mature trees; the site has forested edges.

Flora observed around creek:

Bass wood
White Wood Aster
Japanese Barberry
Black Walnut
Oriental Bittersweet
Reed Canary Grass



Aerial Location Map:



Fauna Observed during Site Visits

Birds
Screech Owl – distance
Catbird
Crow
Titmouse
Barn Swallow
<u>Damselfly</u>
Ebony Jewelwing
Eastern Forktail

Date Deployed	07/11/2016 To 7/14/2016
Site Name/Location	BLBF1: Billfold Bluffs Property Owner: Schwartz
Lat/Long	40° 34' 41.78" N 75° 08' 21.82" W
Weather Conditions Set up	Hot, sunny, humid. Temp: 86°
Mic Facing Direction	10% below horizontal, mic elevation of: 18 ft, 247°SW
Temp. Set Temp. Rise Survey Conditions	77° - Average start 62° Average Finish Clear / No Rain Humidity +/-53%
Total Hours Operated	26 hours
Files Recorded	300 files recorded
Settings	Gain = 60, Trig = 160 Interval = 0



Acoustic Site Description:

Unit is set up western edge of transmission line canopy 95% open.
Mugwort dominates throughout ROW field.

FOREST EDGES

Flora observed around and interior to site:

White Oak
Red Maple
Walnut
Tulip Tree
White Pine

NOTE: Rain during deployment < .25'



Looking Down Grade from Monitor

Aerial Location Map Showing Mic Location and Direction:



Fauna Observed during Site Visits (All four deployments at BLBF 7.1.16:

Birds	Moths	Butterflies
Red tailed Hawk	Hummingbird Moth	Cabbage White
Indigo Buntings		Great Spangled Fritillary
Field Sparrow		
Catbird	Dragonflies	
Robin	Common White tail	
Grackle		
Tufted Titmouse		
Chickadee		

Date Deployed	07/11/2016 To 7/14/2016
Site Name/Location	BLBF2: Billfold Bluffs Property Owner: Schwartz
Lat/Long	40° 34' 42.23" N 75° 08' 22.05" W
Weather Conditions Set up	Hot, sunny, humid. Temp: 86°
Mic Facing Direction	15% below horizontal, mic elevation of : 17ft , 247°SW
Temp. Set	77°
Temp. Rise	62°
Survey Conditions	Clear / No Rain Humidity +/-53%
Total Hours Operated	26 hours
Files Recorded	517 files recorded
Settings	Gain = 60, Trig = 160 Interval = 0



Acoustic Site Description:

Unit is set up western edge of transmission line canopy 95% open.

Mugwort dominates throughout ROW field. Dogbane, multiflora rose, highbush blackberry, goldenrod sp., aster sp., russian olive

FOREST EDGES

Flora observed around and interior to site:

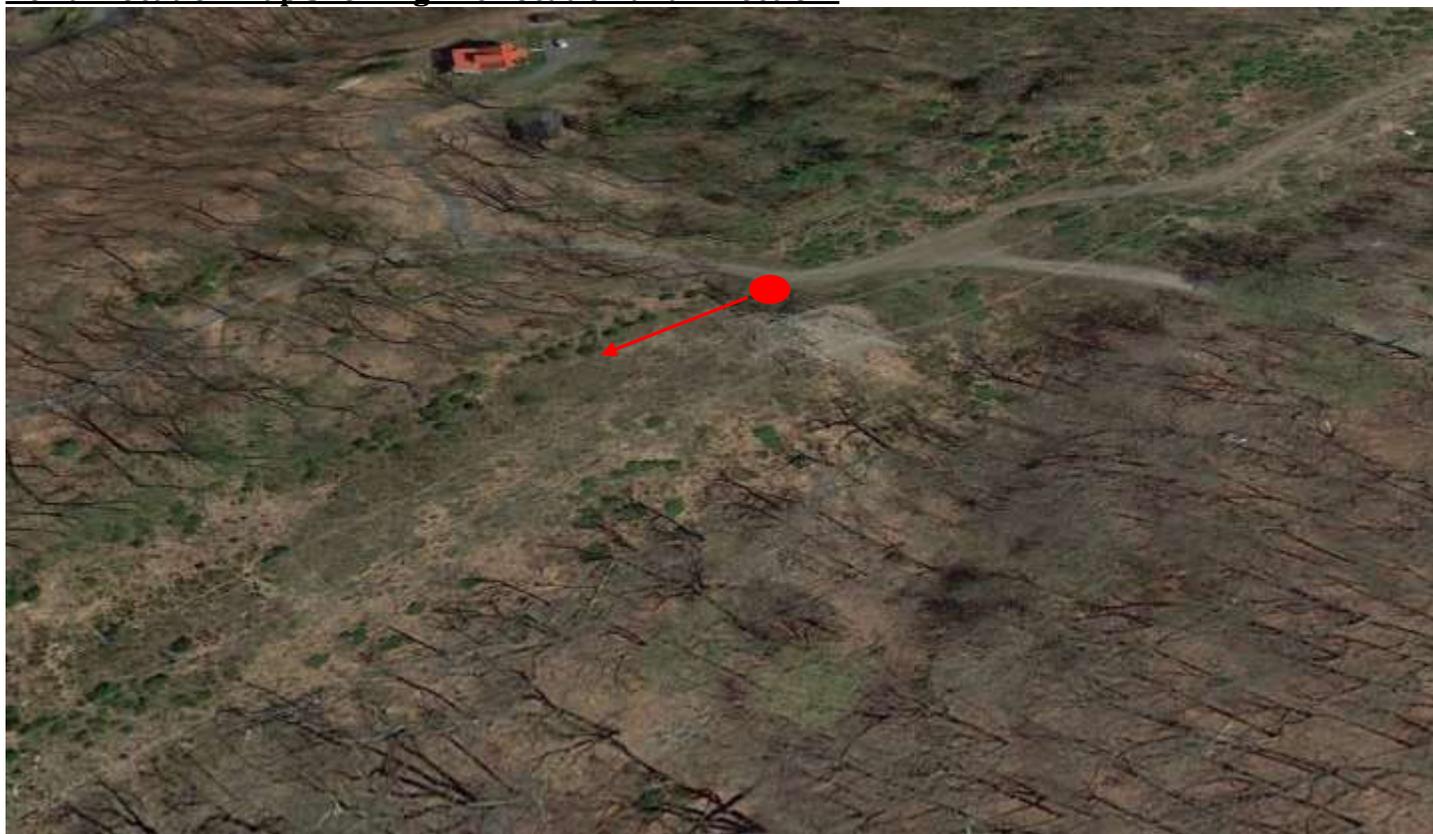
White Oak
Red Maple
Walnut
Tulip Tree
White Pine

NOTE: Rain during deployment < .25'



Looking Down Grade from Monitor

Aerial Location Map Showing Mic Location and Direction:



Fauna Observed during Site Visits (All four deployments at BLBF 7.1.16:

Birds	Moths	Butterflies
Red tailed Hawk	Hummingbird Moth	Cabbage White
Indigo Buntings		Great Spangled Fritillary
Field Sparrow		
Catbird	Dragonflies	
Robin	Common White tail	
Grackle		
Tufted Titmouse		
Chickadee		

Date Deployed	07/11/2016 To 7/14/2016
Site Name/Location	BLBF3: Billfold Bluffs Property Owner: Schwartz
Lat/Long	40° 34' 42.16" N 75° 08' 19.99" W
Weather Conditions Set up	Hot, sunny, humid. Temp: 86°
Mic Facing Direction	15% below horizontal, mic elevation of : 21ft , 248°SW
Temp. Set	77°
Temp. Rise	62°
Survey Conditions	Clear / No Rain Humidity +/-53%
Total Hours Operated	26 hours
Files Recorded	479 files recorded
Settings	Gain = 60, Trig = 160 Interval = 0



Acoustic Site Description:

Unit is set up eastern edge of transmission line canopy 95% open. Mugwort dominates throughout ROW field. Multiflora rose, highbush blackberry, horse nettle, russian olive, goldenrod sp., Aster sp., milkweed, dogbane

FOREST EDGES

Flora observed around and interior to site:

White Oak
Red Maple
Walnut
Tulip Tree
White Pine

NOTE: Rain during deployment < .25'

Looking Down Grade from Monitor



Aerial Location Map

Showing Mic Location and Direction:



Fauna Observed during Site Visits (All four deployments at BLBF 7.1.16:

Birds	Moths	Butterflies
Red tailed Hawk	Hummingbird Moth	Cabbage White
Indigo Buntings		Great Spangled Fritillary
Field Sparrow		
Catbird	Dragonflies	
Robin	Common White tail	
Grackle		
Tufted Titmouse		
Chickadee		

Date Deployed	07/11/2016 To 7/14/2016
Site Name/Location	BLBF4: Billfold Bluffs Property Owner: Schwartz
Lat/Long	40° 34' 42.75" N 75° 08' 20.43" W
Weather Conditions Set up	Hot, sunny, humid. Temp: 86°
Mic Facing Direction	15% above horizontal, mic elevation of : 20 ft , 22°NE
Temp. Set	77°
Temp. Rise	62°
Survey Conditions	Clear / No Rain Humidity +/-53%
Total Hours Operated	26 hours
Files Recorded	181 files recorded
Settings	Gain = 60, Trig = 160 Interval = 0



Acoustic Site Description:

Unit is set up western edge of transmission line NE - canopy 95% open.

Mugwort dominates throughout ROW field. Multiflora rose, highbush blackberry, horse nettle, russian olive, goldenrod sp., Aster sp., milkweed, dogbane

FOREST EDGES

Flora observed around and interior to site:

White Oak
Red Maple
Walnut
Tulip Tree
White Pine

NOTE: Rain during deployment < .25'

Looking Down Grade from Monitor



Aerial Location Map Showing Mic Location and Direction:



Fauna Observed during Site Visits (All four deployments at BLBF 7.1.16:

Birds	Moths	Butterflies
Red tailed Hawk	Hummingbird Moth	Cabbage White
Indigo Buntings		Great Spangled Fritillary
Field Sparrow		
Catbird	Dragonflies	
Robin	Common White tail	
Grackle		
Tufted Titmouse		
Chickadee		

Date	07/08/2016 to 07/11/16
Site Name/Locaton	BKVL POND Brookville Hollow Road, Delaware Township
Lat/Long	40° 24' 49.05"N 74° 57' 8.157"W
Weather Conditions Set up	Sunny but partially cloudy, hot and humid
Mic Facing Direction	Facing N-NE horizontal Mic Elevation of: 12ft horn attached Facing: 81° SW
Temp. Set Temp. Rise Survey Conditions	{ 84° Average Start } { 76° Average Finish } Clear / No Rain except less than .2 inches 7/10 Humidity +/-53%
Site Elevation	271 ft. elevation
Total Hours Operated	26 hours
Files Recorded	789 files recorded
Settings	Gain = 60, Trig = 160 Interval = 0



Acoustic Site Description:

The site is over an open meadow at the edge of a man made pond.

Pond is shallow and algae dominated – clarity limited

There are sporadic mature trees; the site has forested edges.

Edges dominated by Jewelweed, Polygonums, reed canary grass, Blue Vervain, Joe-Pye weed

Flora observed around Pond in forested edges

Bass wood

White Wood Aster

Japanese Barberry

Black Walnut

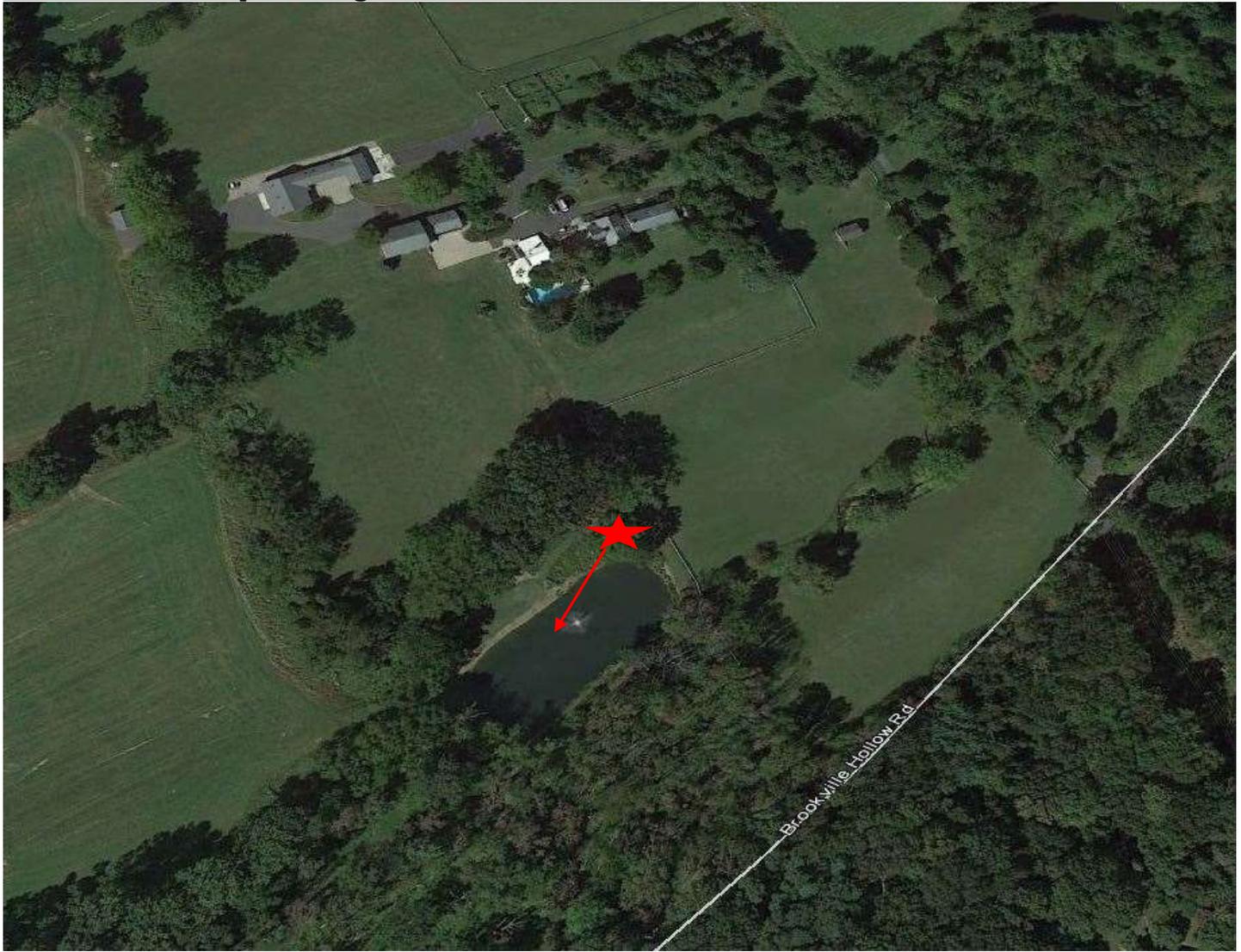
Oriental Bittersweet

Red Maple

White Oak

Red Oak

Aerial Location Map Showing Direction of Monitor:



Fauna Observed during Site Visits

Birds
Catbird
Crow
Titmouse
Barn Swallow
Robin
Yellow Warbler
Common Yellowthroat
<u>Damselfly</u>
Ebony Jewelwing
Violet Dancer
<u>Dragonfly</u>
Common White Tail
Eastern AmberWing



Date Deployed:	07/07/2016
Site Name/Location	CPCR1 Copper Creek, Kingwood
Lat/Long	40° 30'41.503" 75°20'20.671"
Weather Conditions Set up	Cloudy, humid, scattered showers day. Temp: 88°
Mic Facing Direction	15° above Horizontal Mic Elevation of: 10' ft Mic Facing: 340 °
Temp. Set	81°
Temp. Rise	71°
Survey Conditions	Clear / No Rain Humidity +/-53%
Total Hours Operated	9 hours
Files Recorded	62 files recorded
Settings	Gain = 40 , Trig = 160 Interval = 0

Acoustic Site Description:

The mic is facing copper creek which 100% open and uncluttered.

It is a shrub scrub habitat.

Stream is about 1 inch / 1-2 inch in depth.

The creek is covered in silty argillite and fine grained sandstones.

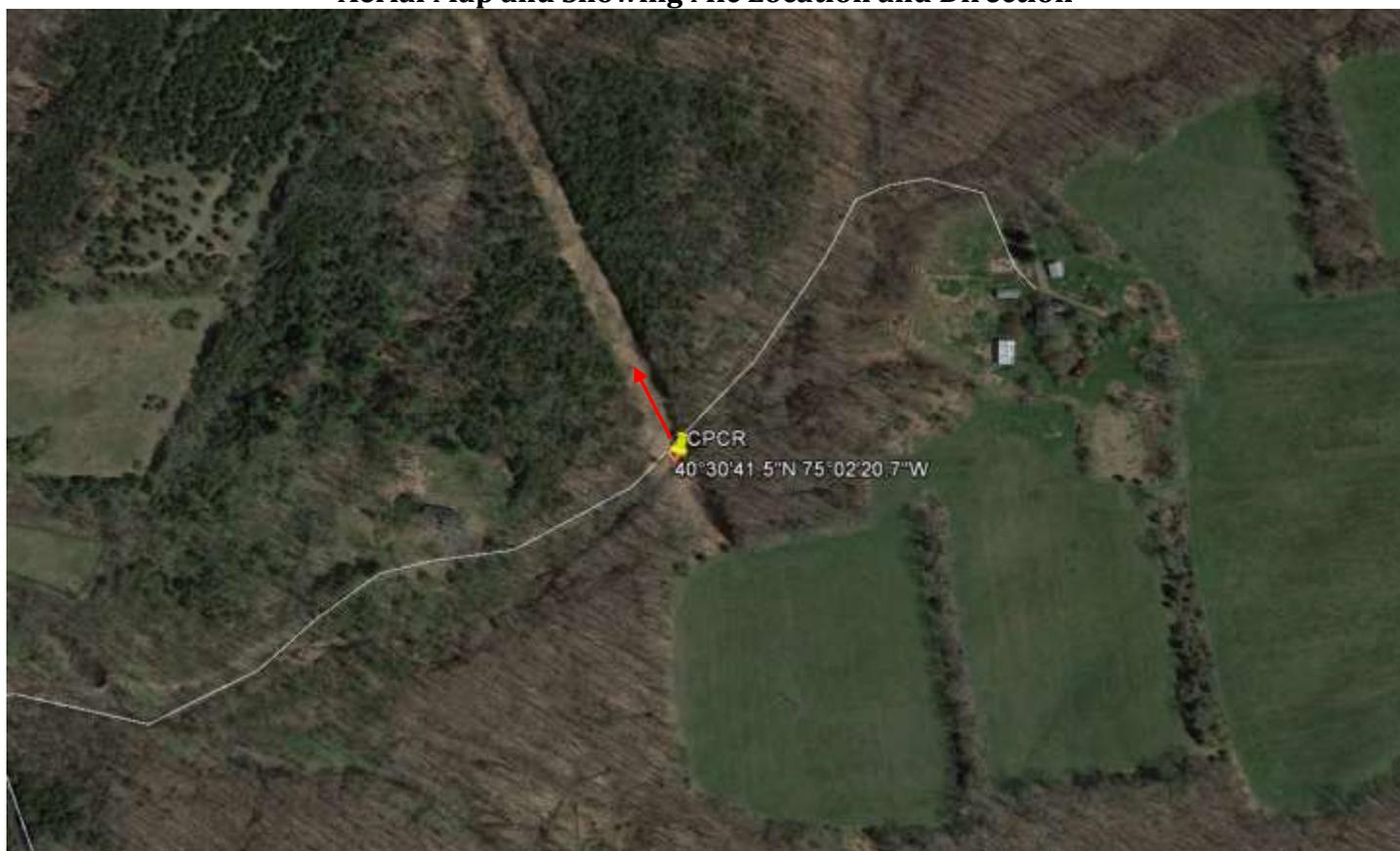
The site is red maple dominated, green ash and red oak sub-dominant

Flora observed around creek:

Wineberry
Russian Olive
New York Fern
Goldenrod sp.
Honeysuckle sp.
Pokeberry
Mullien
Beardtongue
Yarrow
Thistle
Multi-flora rose



Aerial Map and Showing Mic Location and Direction



Birds	Butterflies
Carolina Wren	Cabbage Whites
House Wren	Fritillary Great Spangled
Red-Eyed Vireo	Silver spotted Skipper
Yellow Throated Vireo	
Cat Bird	
Green Frog - stream	

Date Deployed:	07/07/2016
Site Name/Location	CPCR2 Copper Creek, Kingwood Opposite Side of CPR1
Lat/Long	40° 30' 41.40" W 75° 20' 20.52" N
Weather Conditions Set up	Day: Cloudy, humid, scattered showers day. Temp: 88°
Mic Facing Direction	15° above Horizontal Mic Elevation of: 12' Mic Facing: 157°
Temp. Set Temp. Rise Survey Conditions	81° 71° Clear / No Rain Humidity +/-53%
Total Hours Operated	9 hours
Files Recorded	49 files recorded
Settings	Gain = 40 , Trig = 160 Interval = 0



Acoustic Site Description:

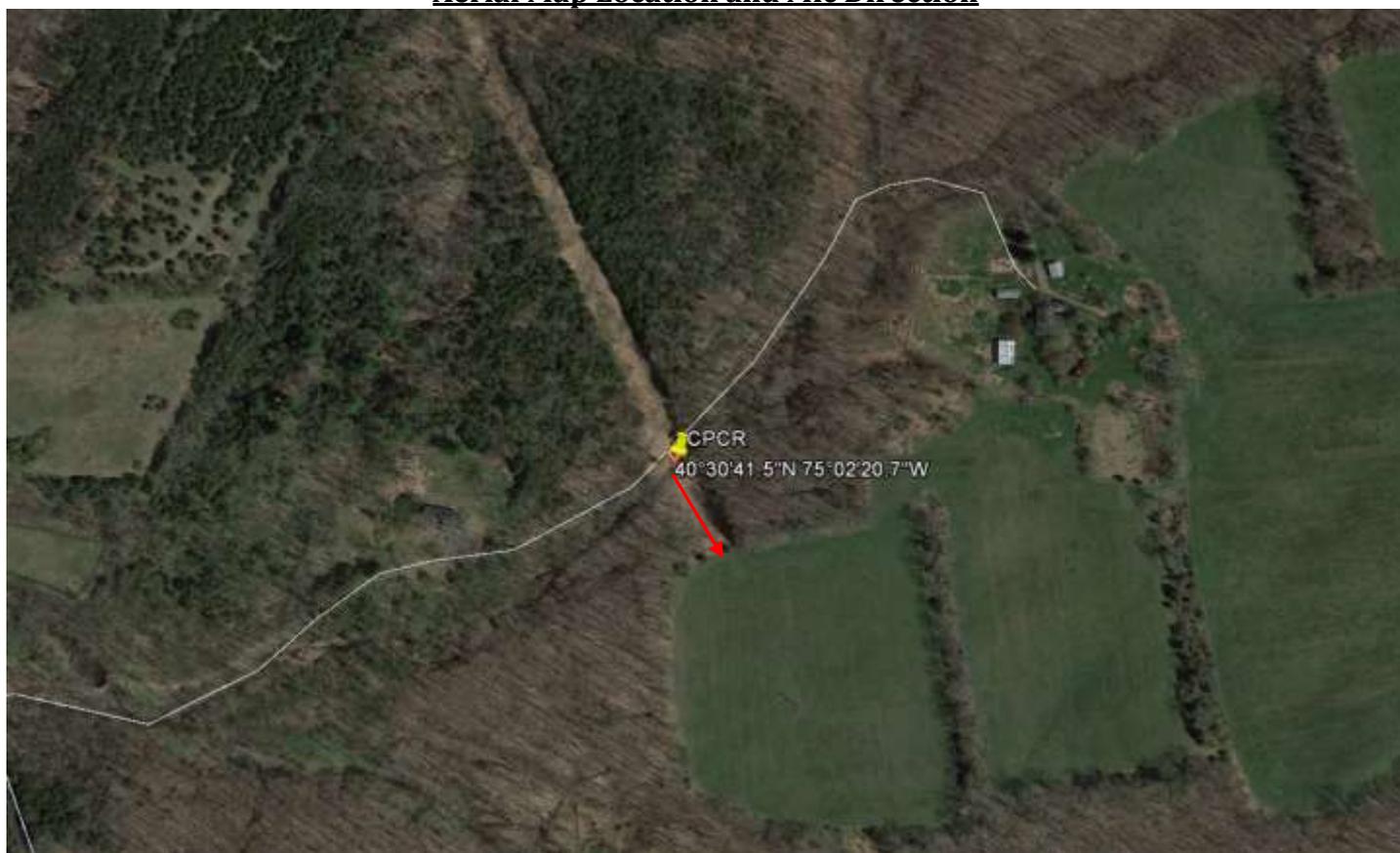
The mic is facing south of copper creek which 100% open and uncluttered. Positioned in shoulder of Dirt Road. It is a shrub scrub habitat. Forested on either side of ROW
The site forest edges are red maple dominated, green ash and red oak sub-dominant

Flora observed around creek:

Russian Olive
Hay scented Fern
Goldenrod sp.
Honeysuckle sp.
Pokeberry
Mullien
Beardtongue
Yarrow
Thistle - abundant
Multi-flora rose
Stilt grass

NOTE: First 6 wav. And log file not recorded – equipment or operator failure

Aerial Map Location and Mic Direction



Birds	Butterflies
Carolina Wren	Cabbage Whites
House Wren	Fritillary Great Spangled
Red-Eyed Vireo	Clouded Sulphur
Common Yellowthroat	Silver spotted Skipper
Cat Bird	Least Skipper

Date Deployed	08/05/16 To 08/08/2016
Site Name/Location	FBRD1: Featherbed Road Property Owner: Kager
Lat/Long	40° 28' 05.60" N 75° 00' 39.10" W
Weather Conditions Set up	Hot, sunny, humid. Temp: 80°
Mic Facing Direction	5% below horizontal, mic elevation of : 22 ft , 45°NE
Temp. Set Temp. Rise Survey Conditions	71-74° 63 -68° Clear / No Rain during deployment Humidity +/-53%
Total Hours Operated	28.5 hours
Files Recorded	3174 files recorded
Settings	Gain = 45, Trig = 160 Interval = 0



Acoustic Site Description:

Sedge/rush line stream, Polygonums, reed canary grass – mic pointing into cluttered forest interior (85% canopy closure)

11' wide stream 4" depth slow moving, 1.5' bank on both sides

FOREST EDGES

Flora observed around and interior to site:

- White Oak
- Red Maple
- Red Oak
- Green Ash
- Pin Oak
- White Pine

NOTE: Rain during deployment < .15'

ROW:

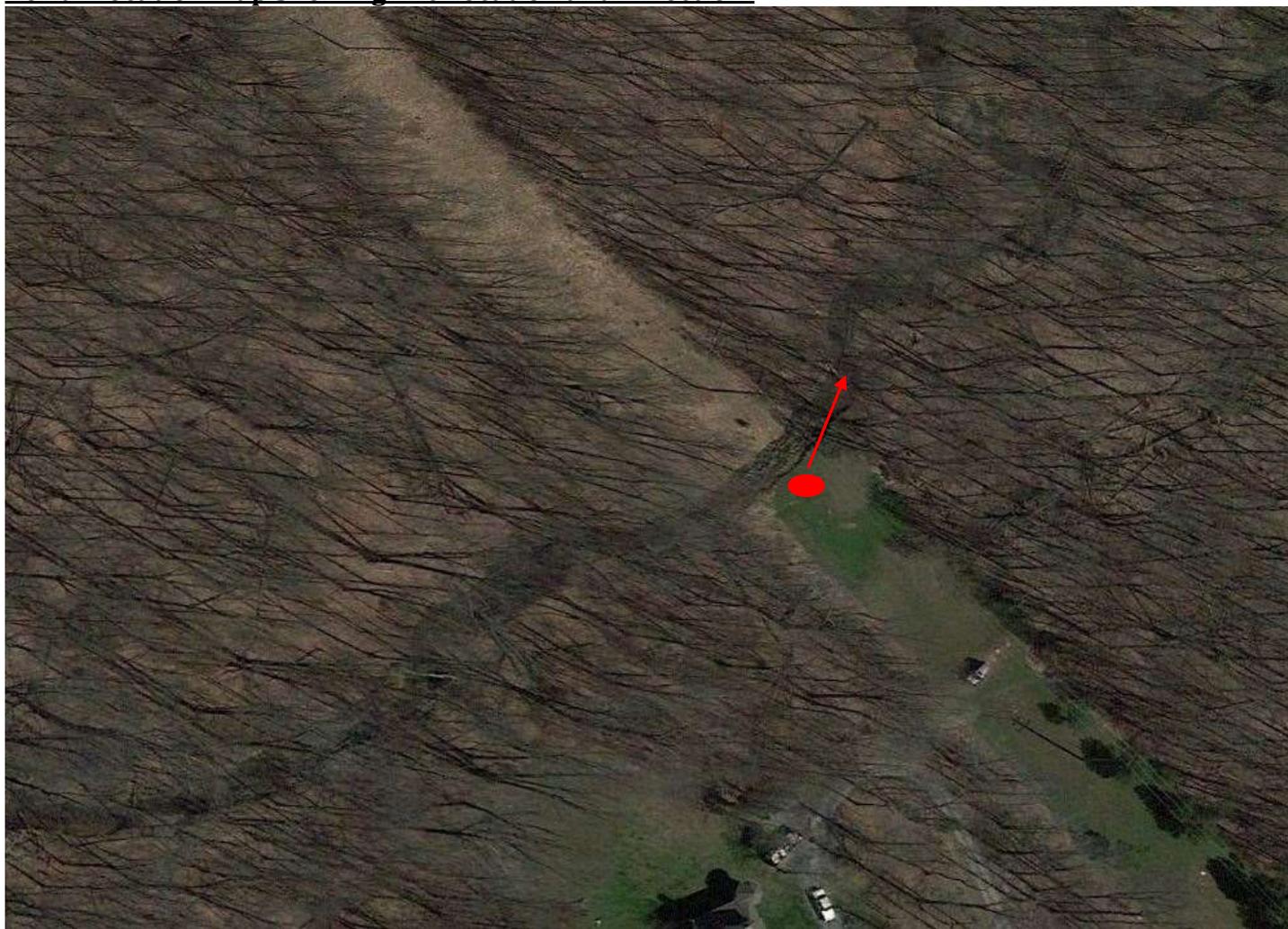
Sedges, rushes, reed canary timothy, orchard grass, HB Blackberry

Looking Down ROW from Monitor



gr.

Aerial Location Map Showing Mic Location and Direction:



Fauna Observed during Site Visits:

Birds	Moths	Butterflies
Red tailed Hawk	Elegant grass veneer	Cabbage White
Indigo Buntings		Least Skipper
Red-headed Woodpecker Adults		
Catbird	Dragonflies	
Robin	Common White tail	
	Slaty Skimmer	
	Green Darner	

Date	07/011/2016
Site Name/Location	HSFR = Homestead Farm Road Along Harihokake Creek
Lat/Long	40° 34'15.00" N 75° 03'18.37" W
Weather Conditions Set up	Sunny, hot, partially cloudy. Temp: 87°
Mic Facing Direction	10% below horizontal, mic elevation of : 21'ft facing South 190°
Temp. Set	85°
Temp. Rise	68°
Survey Conditions	Clear / No Rain Humidity +/-53%
Total Hours Operated	9 hours
Site Elevation	175'
Files Recorded	0 files recorded
Settings	Gain = 40 , Trig = 160 Interval = 0



Acoustic Site Description:

Monitor set up in a cluttered and partially closed riparian corridor of the Harihokake Creek (60% closed) – pointing over stream 25'ft

wide, banks steep, deep pools, slow moving , cobble bottom, log strewn

Flora observed around creek:

95% canopy cover

Reed canary grass
Green Bullrush
Soft rush
Forget-me-not
Glyceria grass
Scattered Barberry
Black Walnut
Red Maple
Green Ash
Shagbark Hickory
White Oak
Phlox



Aerial Location Map Showing Direction of Mic:



Date	07/11/2016
Site Name/Location	JVRD: Javes Road, Holland Township Along Hakihokaki Creek
Lat/Long	40°34'59.55" N 75°05'39.25" W
Weather Conditions Set up	Clear, partial clouds. Temp: 86°
Mic Facing Direction	10% below horizontal, mic elevation of : 18ft , 285° W-NW
Temp. Set	77°
Temp. Rise	62°
Survey Conditions	Clear / No Rain Humidity +/-53%
Total Hours Operated	9 hours
Files Recorded	30 files recorded
Settings	Gain = 60, Trig = 160, Interval = 0



Acoustic Site Description:

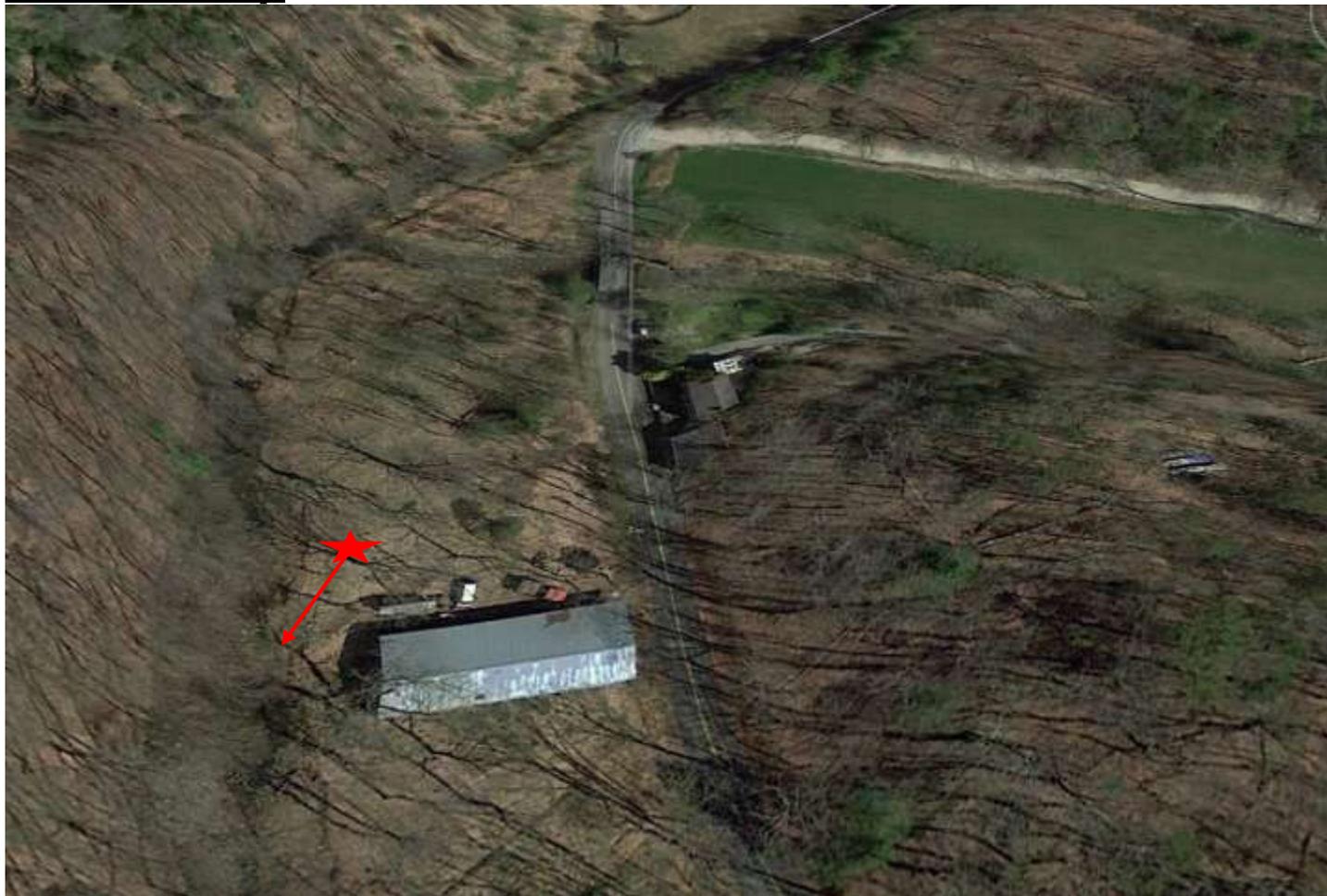
The unit is set up over a 40' wide flowing creek next to 220' vegetated bank that is sycamore dominated. The flood plain is dominated by stilt grass / sedge meadow, and the bank is filled with abundant vegetation.

Flora observed around creek:

Sycamore
Walnut
Ash
Maple
White Snakeroot
Black Cherry
Multiflora Rose
Dames Rocket



Aerial Location Map:



Fauna Observed during Site Visits

Birds	Dragonflies	Butterflies	Herptiles
House Wren	Ebony Jeweled Wing	Cabbage White	Two Lined Salamander
Blue Gray Gnat Catcher	Common Whitetail	Least Skipper	
Cardinal		Great Spangled fritillary	
American Crow			
Scarlet Tanager			
House Finch		<u>8-spotted forester - Moth</u>	

Date	07/06/2016
Site Name/Location	LWCR: Lower Creek, Kingwood/Stockton, NJ
Lat/Long	40° 25'56.965" N 74° 58'13.473" W
Weather Conditions Set up	Sunny, hot, humid, partially cloudy. Temp: 87° 67% humidity.
Mic Facing Direction	Horizontal, mic elevation of : 8ft SW 225° mic direction
Temp. Set Temp. Rise Survey Conditions	83° 76° Clear / No Rain / Wind < 3mph Humidity +/-65%
Total Hours Operated	9 hours
Site Elevation	45.52ft
Files Recorded	87 files recorded
Settings	Gain = 40 , Trig = 160 , Interval = 0



Acoustic Site Description:

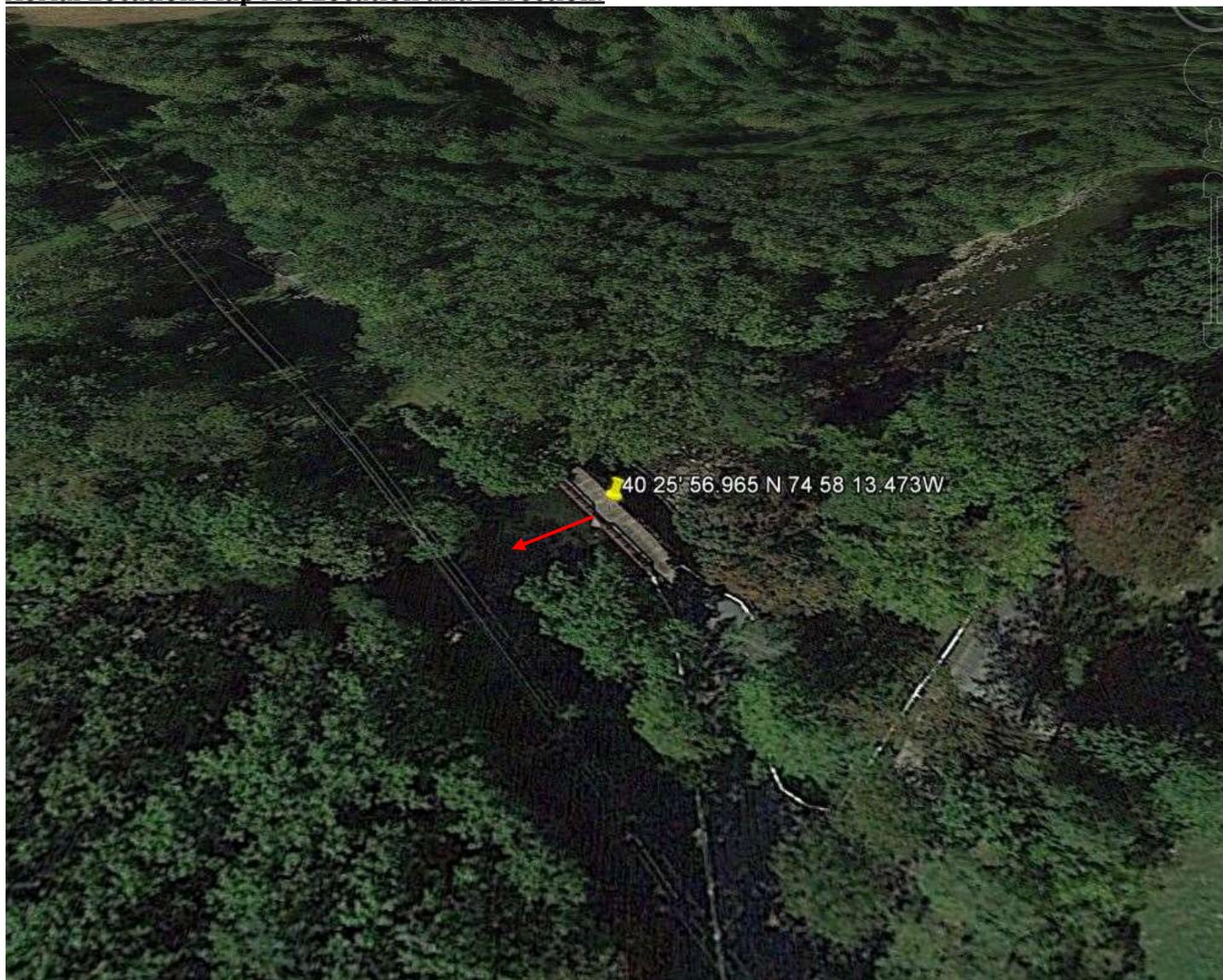
The mic is set up over a creek from on top of driveway bridge – effective height 25' water height of 3-4 inches in creek - banks ranging from 4ft to 30ft in some localized areas. There is abundant red oak, red maple, and sycamore across the mic set up. 65% closed system over water – cluttered. The river bottom is an argillite rock – sandstone – mud shales. Stream flow is slow – water low.

Flora observed in riparian edges of creek:

Sycamore
Red Maple
Red Oak
Sweet Birch
Rhododendron – Mtn.
Laurel
Christmas Fern
Green Ash
Flowering dogwood
Sycamore
Water Plaintain
Stiltgrass
Sugar maple



Aerial Location Map Mic Location and Direction:



Fauna Observed during Site Visits

Birds
Cardinal
Wood Pee Wee
Wood Thrush
Catbird
Rose breasted grosbeak
Northern Flicker
Yellowthroat Common
Downy Woodpecker
Baltimore Oriole
Cowbird

Date	07/15/2016 to 07/17/16
Site Name/Location	PLVR1 = Pleasant Valley Road, Mercer Co. Top of ROW
Lat/Long	40° 20' 05.12" N 74° 53' 48.73" W
Weather Conditions Set up	Sunny, very hot, partially cloudy. Temp: 92°
Mic Facing Direction	10% below horizontal, mic elevation of : 21'ft facing WNW 290°
Temp. Set Temp. Rise Survey Conditions	85° Ave. 68° Ave. Clear / No Rain – (light rain few hours of deployment Humidity +/-58% Ave.
Total Hours Operated	26.5 hours
Site Elevation	145'
Files Recorded	3,171 files recorded
Settings	Gain = 45 , Trig = 160 Interval = 0



Acoustic Site Description:

ROW within Baldpate Mtn Preserve – Set up facing downslope of south side of Baldpate Mtn.

An open, 100% , field ROW dominated by meadow forbs/shrubs 120' wide in most places – closed deciduous mid-seral forest on both north and south sides.

Dominant Flora in ROW:

Multi
flora

rose
Yarrow
Highbush blackberry
Barberry Jap.
Honeysuckle sp.
Russian Olive
Pokeberry
Staghorn Sumac
Timothy
Orchard Grass
Deer Tongue Grass
Giant Foxtail

North and South Forest Edge:



White and red oak, Red maple Green Ash, Honey Locust

Aerial Location Map Showing Direction of Mic:



Fauna Observed during Site Visits:

Birds	Moths	Butterflies
Red tailed Hawk	Elegant grass veneer	Cabbage White
Indigo Buntings	Early Fanfoot	Least Skipper
Cedar Waxwings		Silver Spotted Skipper
Catbird	Dragonflies	
Robin	Common White tail	
House Finch		
Yellow Warbler	Green Darner	
Chestnut Sided-Warbler		

Date	07/15/2016 to 07/17/16
Site Name/Location	PLVR2 = Pleasant Valley Road, Mercer Co. Top of ROW
Lat/Long	40° 20'04.59" N 74° 53'47.17" W
Weather Conditions Set up	Sunny, very hot, partially cloudy. Temp: 92°
Mic Facing Direction	10% below horizontal, mic elevation of : 21'ft facing ESE 110°
Temp. Set	85° Ave.
Temp. Rise	68° Ave.
Survey Conditions	Clear / No Rain – (light rain few hours of deployment Humidity +/-58% Ave.
Total Hours Operated	26.5 hours
Site Elevation	144'
Files Recorded	3,403 files recorded
Settings	Gain = 45, Trig = 160 Interval = 0



Acoustic Site Description:

ROW within Baldpate Mtn Preserve – Set up facing downslope of south side of Baldpate Mtn.

An open, 100% , field ROW dominated by meadow forbs/shrubs 120' wide in most places – closed deciduous mid-seral forest on both north and south sides.

Dominant Flora in ROW:

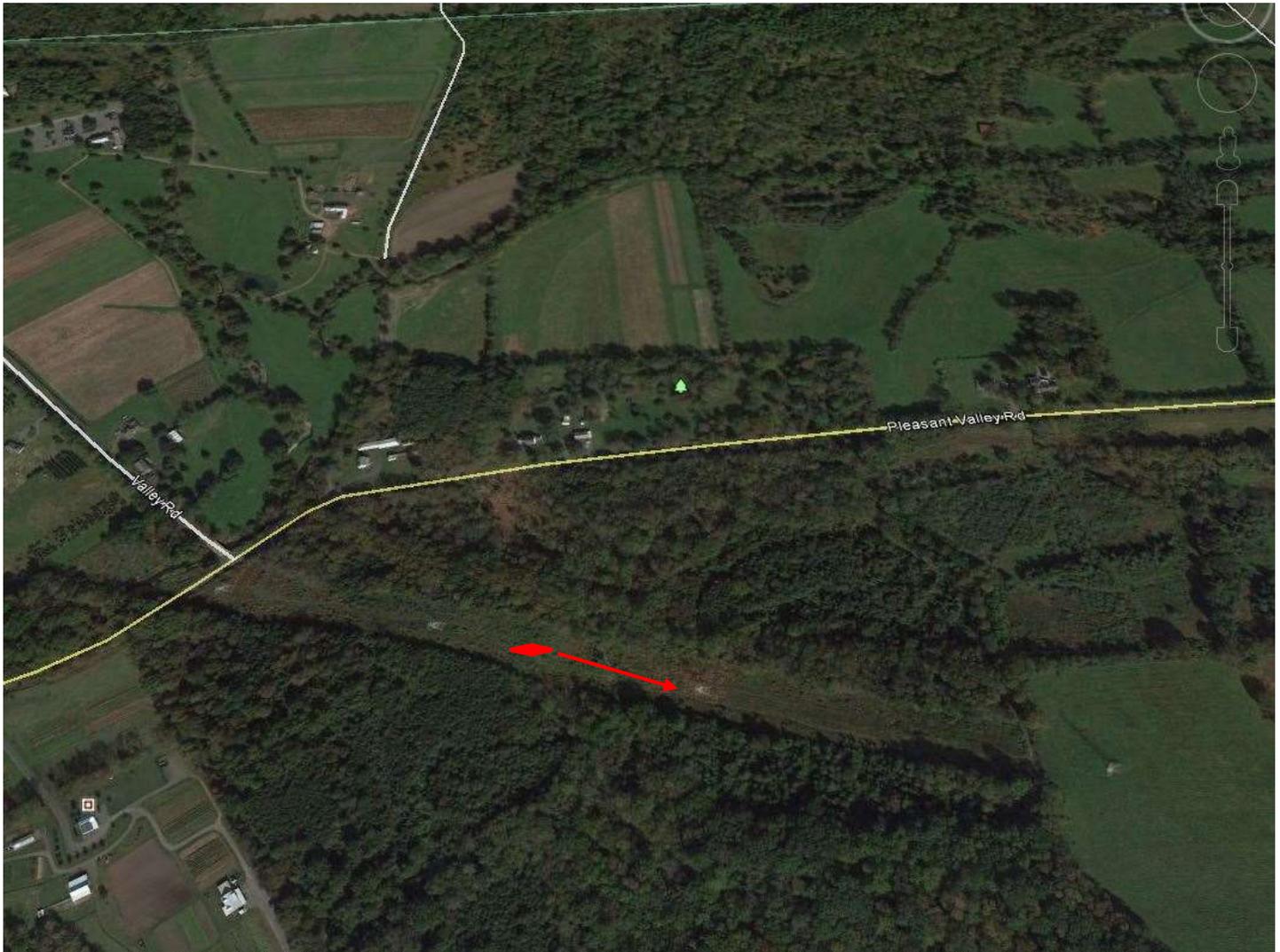
Multi flora rose
Yarrow
Highbush blackberry
Barberry Jap.
Honeysuckle sp.
Russian Olive
Pokeberry
Staghorn Sumac
Timothy
Orchard Grass
Deer Tongue Grass
Giant Foxtail

North and South Forest Edge:



White and red oak, Red maple Green Ash, Honey Locust

Aerial Location Map Showing Direction of Mic:



Fauna Observed during Site Visits:

Birds	Moths	Butterflies
Red tailed Hawk	Elegant grass veneer	Cabbage White
Indigo Buntings	Early Fanfoot	Least Skipper
Cedar Waxwings		Silver Spotted Skipper
Catbird	Dragonflies	
Robin	Common White tail	
House Finch		
Yellow Warbler	Green Darner	
Chestnut Sided-Warbler		

Date	07/15/2016 to 07/17/16
Site Name/Location	PLVR3 = Pleasant Valley Road, Mercer Co. Over Moore's Creek
Lat/Long	40° 20' 08.65" N 74° 53' 54.88" W
Weather Conditions Set up	Sunny, very hot, partially cloudy. Temp: 92°
Mic Facing Direction	5% below horizontal, mic elevation of: 18'ft facing WSW 240°
Temp. Set Temp. Rise Survey Conditions	85° Ave. 68° Ave. Clear / No Rain - (light rain few hours of deployment Humidity +/-58% Ave.
Total Hours Operated	26.5 hours
Site Elevation	71'
Files Recorded	26 files recorded
Settings	Gain = 45, Trig = 160 Interval = 0



Acoustic Site Description:

Stream bed corridor – partially cluttered – 35% canopy over stream – mic facing open water

Sandy shoals and shallow water – stream 15' wide in most areas – slow flow



Image of Habitat along Stream corridor

Dominant Flora in riparian zone:

Multi flora rose, Polygonums Species, Honeysuckle sp., Russian Olive, Pokeberry
 Staghorn Sumac, Mugwort, V. Creeper, Poison Ivy, Sedge sp.

Aerial Location Map Showing Direction of Mic:



Fauna Observed during Site Visits:

Birds	Moths	Butterflies
	Delicate Cyncia	Eastern Tailed Blues
Common yellowthroat		Appalachian Eyed brown
Cedar Waxwing		
Catbird	Dragonflies	
Blue Jay	Common White tail	
House Finch	Great Blue Skimmer	
Yellow Warbler	Green Darner	

Date	07/15/2016 to 07/17/16
Site Name/Location	PLVR4 = Pleasant Valley Road, Mercer Co. Over Moore's Creek
Lat/Long	40° 20' 10.74" N 74° 53' 54.33" W
Weather Conditions Set up	Sunny, very hot, partially cloudy. Temp: 88°
Mic Facing Direction	horizontal, mic elevation of: 19'ft facing W 265°
Temp. Set Temp. Rise Survey Conditions	85° Ave. 68° Ave. Clear / No Rain - (light rain few hours of deployment Humidity +/-58% Ave.
Total Hours Operated	26.5 hours
Site Elevation	73'
Files Recorded	225 files recorded
Settings	Gain = 45, Trig = 160 Interval = 0



Acoustic Site Description:

Base sitting on side of stream bank – mic 8' above ground level overlooking farm field - 100% open



Image of Habitat where monitored

Dominant Flora in open field:

Multi flora rose, Reed Canary Grass, Canada thistle, Tearthumb Polygonum, Sedge sp.

Forested Edges: Sycamore, Wineberry, Wild Grape, mile-a-minute, Russian Olive, Red Oak, Red Maple
Multiflora rose

Aerial Location Map Showing Direction of Mic:**Fauna Observed during Site Visits:**

Birds	Moths	Butterflies
	Delicate Cynia	Eastern Tailed Blues
Common yellowthroat		Appalachian Eyed brown
Cedar Waxwing		
Catbird	Dragonflies	
Blue Jay	Common White tail	
House Finch	Great Blue Skimmer	
Yellow Warbler	Green Darner	

Date	07/15/2016 to 07/17/16
Site Name/Location	PLVR4 = Pleasant Valley Road, Mercer Co. Over Moore's Creek
Lat/Long	40° 20' 10.74" N 74° 53' 54.33" W
Weather Conditions Set up	Sunny, very hot, partially cloudy. Temp: 88°
Mic Facing Direction	horizontal, mic elevation of: 19'ft facing W 265°
Temp. Set Temp. Rise Survey Conditions	85° Ave. 68° Ave. Clear / No Rain - (light rain few hours of deployment Humidity +/-58% Ave.
Total Hours Operated	26.5 hours
Site Elevation	73'
Files Recorded	225 files recorded
Settings	Gain = 45, Trig = 160 Interval = 0



Acoustic Site Description:

Base sitting on side of stream bank – mic 8' above ground level overlooking farm field - 100% open



Image of Habitat where monitored

Dominant Flora in open field:

Multi flora rose, Reed Canary Grass, Canada thistle, Tearthumb Polygonum, Sedge sp.

Forested Edges: Sycamore, Wineberry, Wild Grape, mile-a-minute, Russian Olive, Red Oak, Red Maple
Multiflora rose

Aerial Location Map Showing Direction of Mic:**Fauna Observed during Site Visits:**

Birds	Moths	Butterflies
	Delicate Cynia	Eastern Tailed Blues
Common yellowthroat		Appalachian Eyed brown
Cedar Waxwing		
Catbird	Dragonflies	
Blue Jay	Common White tail	
House Finch	Great Blue Skimmer	
Yellow Warbler	Green Darner	

Date	07/08/2016 To 7/10/2016
Site Name/Location	RHPD Rolling Hill Pond - Geri/Kohler (RHPD)
Lat/Long	40° 23' 40.83" N 74° 56' 35.86" W
Weather Conditions Set up	Sunny, hot, humid, partially cloudy. Temp: 90°
Mic Facing Direction	10% below horizontal, mic elevation of : 18' Facing: 32°
Temp. Sun Set Sun Rise Survey Conditions	81°Average 73°Average Clear / No Rain 7/9 night: light rain Humidity +/-53%
Total Hours Operated	26 hours
Files Recorded	46 files recorded
Settings	Gain = 40 Trig = 160 Interval = 0

No Image of monitor setup but was raised to 18' and set up farther back from pond shoreline in shrub/scrub field.

Acoustic Site Description:

The site is a pond about 295'x178' and has a bordering mid-seral stage forest.

The pond is 100% open and has abundant green algae.

The water is stagnant and has no flow.

Mucky Farm Pond surrounded by shrub/scrub field and maturing forest

Flora observed around and interior to pond:

Black Willow

Duckweed

Green Ash

Black Walnut

Russian Olive

American Elm

Wineberry

Aerial Location Map:





Fauna Observed during Site Visits

Birds	Dragonflies	Butterflies
Robin	Widow Skimmer	Cabbage Whites
Song Sparrow	Black Saddlebag	Least Skipper
Carolina Wren	Eastern Amberwing	Silver spotted Skipper
Catbird	Slaty Skimmer	
Red Winged Blackbird	<u>Herptiles</u>	
Canada Geese	Painted turtle	
Titmouse Group		
Nuthatch		
Blue Jay		
Swamp Sparrow		

Date	07/06/2016
Site Name/Location	SFRD: Mackey Pond 66 Sanford Road, Stockton NJ
at/Long	40° 27' 47.35" N 74° 59' 15.357" W
Weather Conditions Setup	Sunny but partially cloudy, hot and humid. 90° F, no wind.
Temp. Sset Temp. Srise Survey Conditions	88° 74° Clear/ No Rain Humidity +/- 53%
Mic Facing Direction	Facing 19° N-NE 10° off horizontal Mic elevation of: 11
Site Elevation	260'
Total Hours Operated	8.75 hr.
Files Recorded	641
Settings	Gain = 40, Trig = 160, Interval = 0



Acoustic Site Description:

The site is 100% open pond with mid-seral stage to late seral stage surrounding deciduous Highland Geophysiographic Forest.

Pond surrounded by 100% closed canopy forest.

About ¼ of pond is emergent vegetation and ¾ pond is open water. Mic facing emergent vegetation side of pond.

Flora found around and interior to Pond:

Stinging nettle, Sensitive fern, Marsh fern

Red maple, Green Ash, Grey birch

Woolgrass, Carex stricta, Jewelweed, Polygonum sp., shinning willow, carex sp., pondweeds

Pond dimensions are **468' x 211'**
"Carla's Pond" or "Macky's Pond"



Aerial Location Map:**Fauna Observed During Site Visits:**

Birds	Dragonflies	Herptiles
Red-shouldered Hawk (St. Th.)	Widow Skimmer	Green Frog
Red-tailed Hawk	Blue Dasher	Pickerel Frog
Red-headed Woodpecker (St. Eng.)	Eastern Amberwing	Spring Peeper
Downy Woodpecker	Green Darner	Painted Turtle
Eastern Wood Pee Wee	12-Spotted Skimmer	
Eastern Phoebe	Common Whitetail	
Catbird	Slaty Skimmer	
Cardinal	Eastern Pondhawk	
Red-eyed vireo		
Common Yellowthroat		
Yellow Warbler		

Date	07/06/2016
Site Name/Location	WRMN
Lat/Long	40° 25' 32.12" N 74° 57' 52.18" W
Weather Conditions Set up	Sunny but partially cloudy, hot and humid. Wind under 5mph
Mic Facing Direction	Facing 269° horizontal Mic Elevation of : 8ft
Temp. Set	84°
Temp. Rise	76°
Survey Conditions	Clear / No Rain Humidity +/-53%
Site Elevation	175.45 ft elevation
Total Hours Operated	9 hours
Files Recorded	343 files recorded
Settings	Gain = 40 , Trig = 160 Interval = 0



Acoustic Site Description:

The pond is relatively small surrounded by broad leaf cattail and shining willow.

The pond is 350 x 250; an approximately round pond.

It is surrounded by open meadow/hay meadow with a forested edge that is red maple dominated.

Flora observed around and interior to pond:

Bass wood
White Wood Aster
Japanese Barberry
Black Walnut
Oriental Bittersweet
Reed Canary Grass



Aerial Location MapShowing position

and direction of monitor:



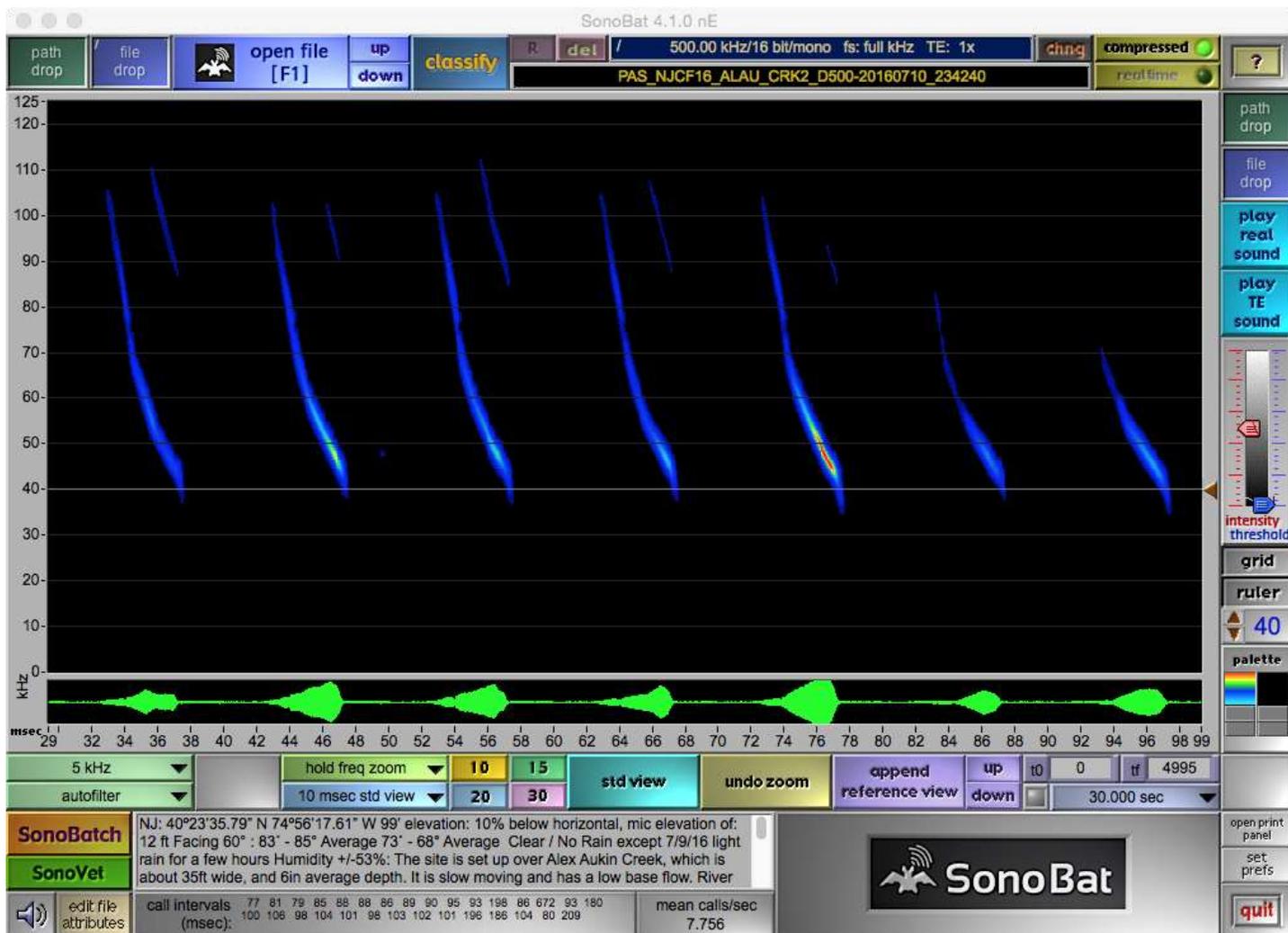
Fauna Observed during Site Visits

Birds	Dragonflies	Herptiles
Red Bellied Woodpecker	Widow Skimmer	Green Frog
Phoebe	Green- Blue Darner	
Baltimore Oriole	Blue Dasher	
Titmouse		

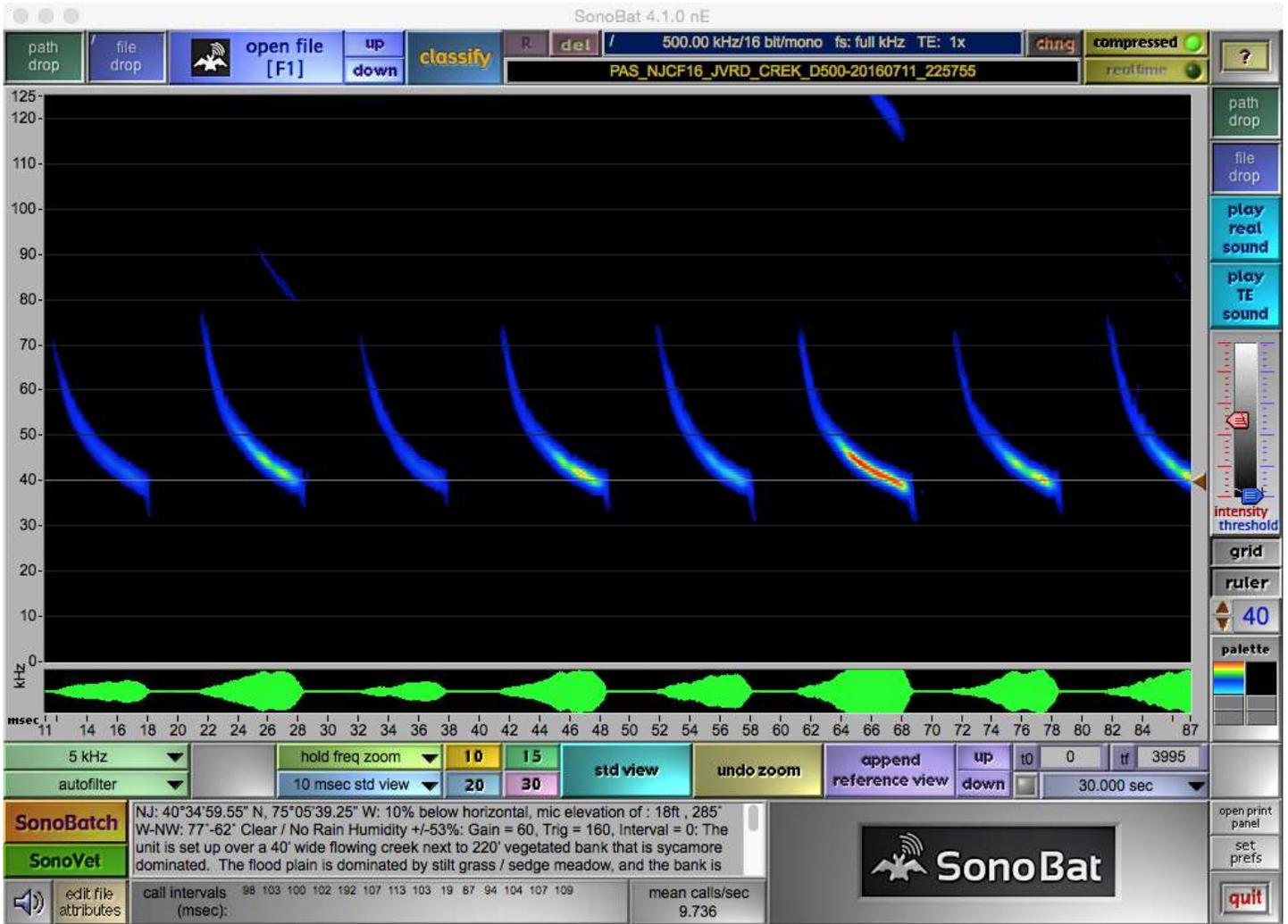
ATTACHMENT C

Examples of spectrograms from confidently classified LUSO ambiguous myotis species guild

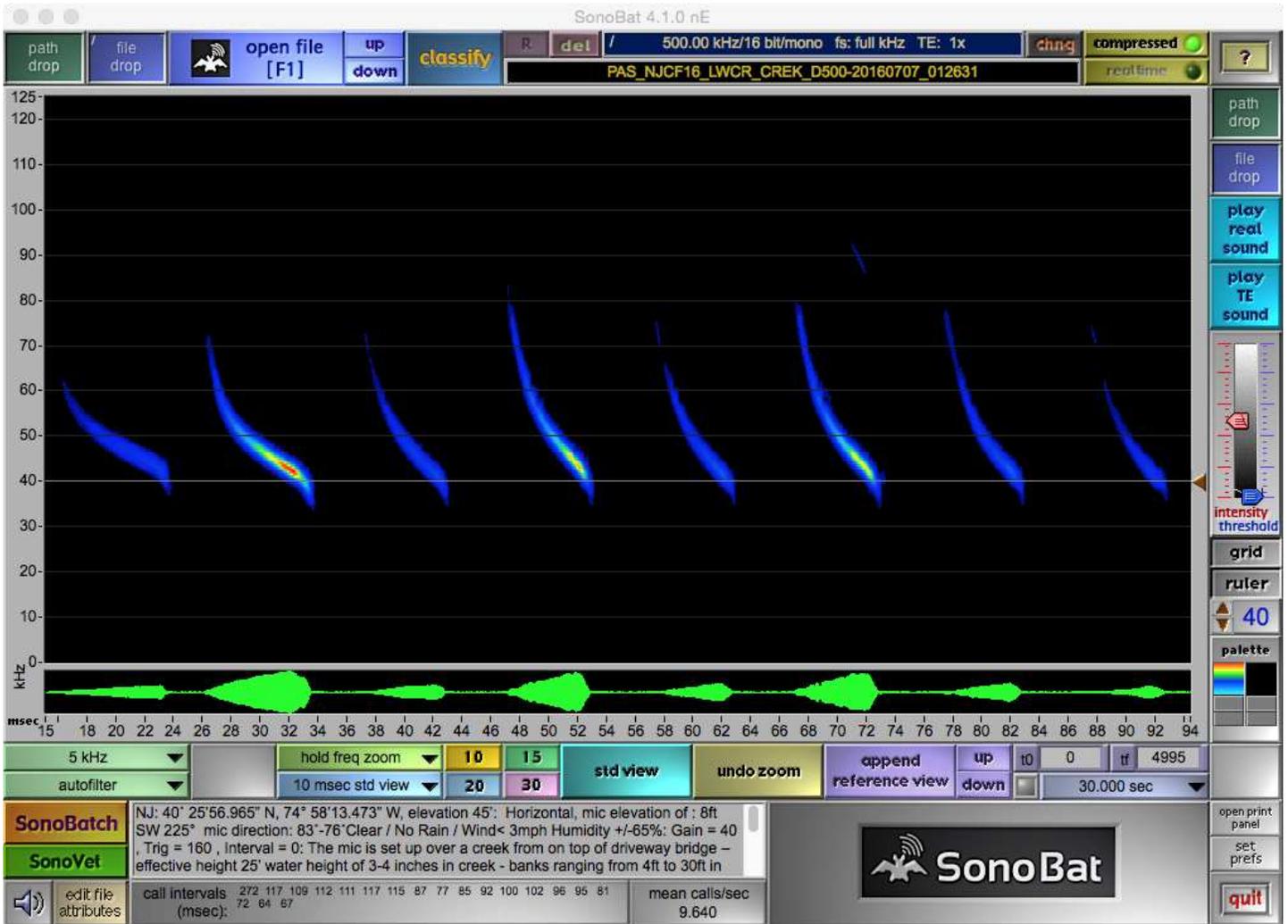
LUSO example from ALAU_CRK2



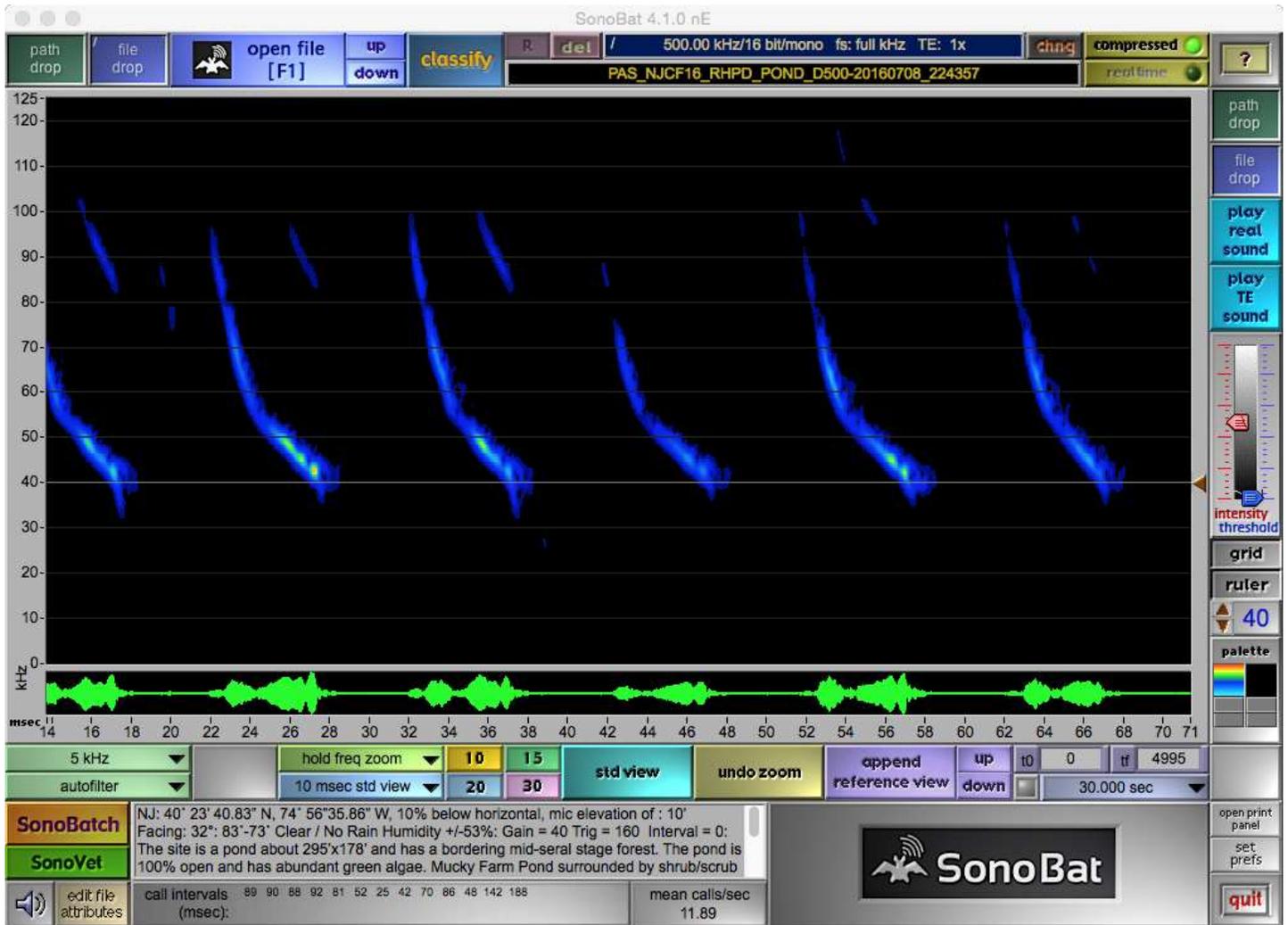
LUSO example from Site: JVRD_CREK



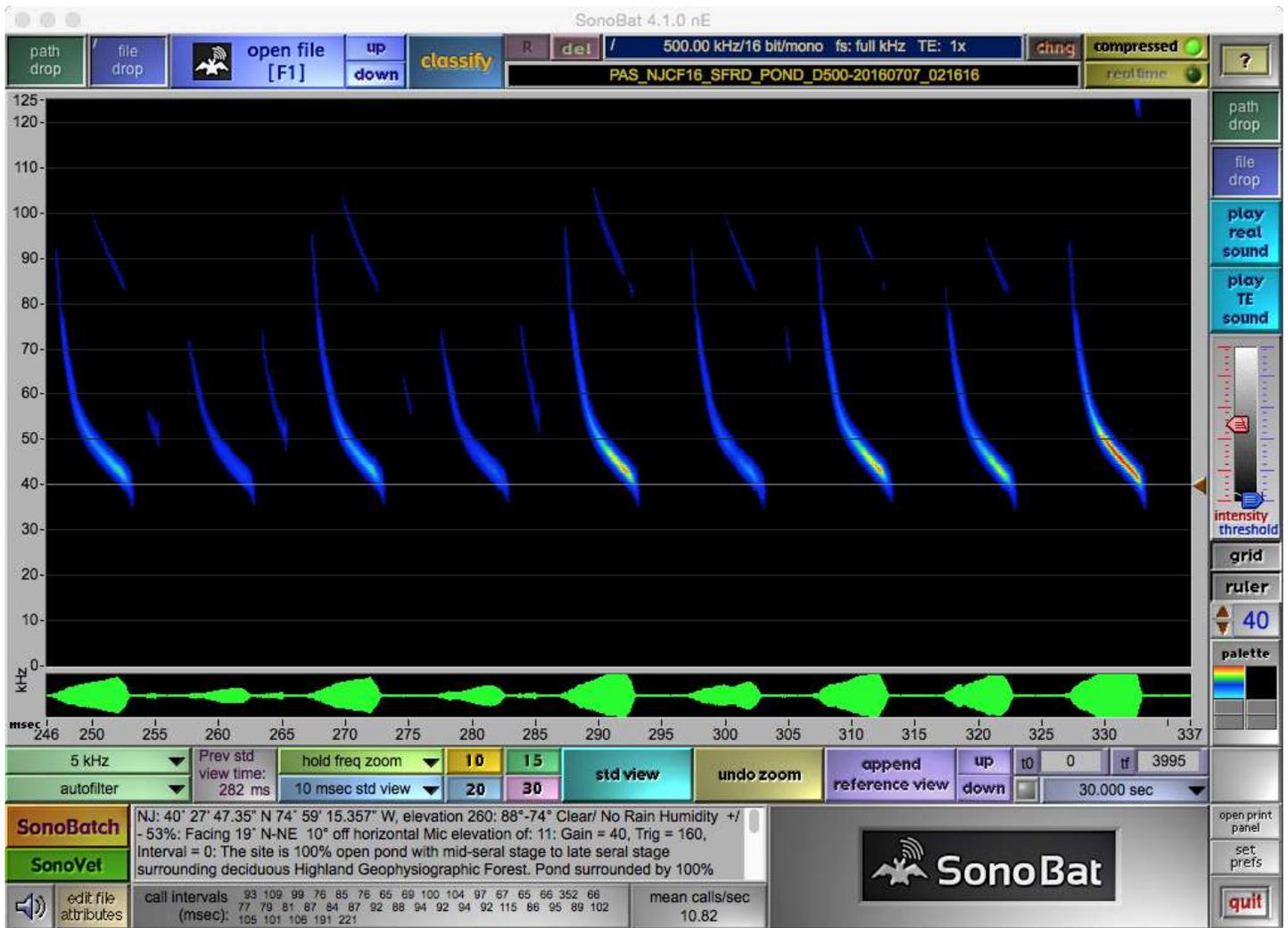
LUSO example from Site: LWCR_CREK



LUSO example from Site: RHPD_POND



LUSO example from Site: SFRD_POND



Document Content(s)

NJConservation Comment.Maps.PDF.....	1-2
Map1_Species.PDF.....	3-3
Map2_Species.PDF.....	4-4
Map3_Species.PDF.....	5-5
Map4_LTSalamander.PDF.....	6-6
NJCFAcousticReport091016.PDF.....	7-75